

# Writing a training loop from scratch

[https://www.tensorflow.org/guide/keras/writing\\_a\\_training\\_loop\\_from\\_scratch](https://www.tensorflow.org/guide/keras/writing_a_training_loop_from_scratch)  
([https://www.tensorflow.org/guide/keras/writing\\_a\\_training\\_loop\\_from\\_scratch](https://www.tensorflow.org/guide/keras/writing_a_training_loop_from_scratch))

## Import libraries

```
In [1]: # Python libraries
import os
import sys
import pandas as pd # for data manipulation
import numpy as np # for data manipulation
import tensorflow as tf
from sklearn.model_selection import train_test_split
from datetime import datetime
import time

# Plotting
import matplotlib.pyplot as plt

# To enable LaTeX and select a font
plt.rcParams.update({
    "text.usetex": True,
    "font.family": "sans-serif",
    "font.sans-serif": "Helvetica",
})

# Using ipynb import functions defined in other nb
sys.path.append("myfun/")
from ipynb.fs.defs.myfun_load_dataset import *
from ipynb.fs.full.myfun_models import *
from ipynb.fs.full.myfun_nn import *
from ipynb.fs.defs.myfun_plot import *
```

2023-09-09 00:20:26.421753: I tensorflow/core/platform/cpu\_feature\_guard.cc:193] This TensorFlow binary is optimized with oneAPI Deep Neural Network Library (oneDNN) to use the following CPU instructions in performance-critical operations: SSE4.1 SSE4.2 AVX AVX2 FMA To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

Tensorflow/Keras: 2.11.0  
sklearn: 1.3.0

## Data Acquisition

```
In [2]: # Load the dataset
par_dir = os.path.dirname(os.getcwd()) # parent dir
dir_name = par_dir + "/NN-interaction"
processed_flag = 'post'
merged_df, dflist = load_dataset(dir_name, processed_flag)
```

## Get $v_0$ mean over each df looping on dflist

```
In [3]: # params
v0_guess = 30
NUM_ITER = 350
LEARNING_RATE_v0 = 0.5
flag_save = True
```

```
In [4]: # Create the model NN
DOE = [[1,2,1], [1,4,1], [1,10,1]] #Design of experiment

# Create the dataset
dataset = dflist
```

```
In [5]: info_alldataset = []

start_time1 = time.time()
for DOE_struct in DOE:

    print("\n")
    print("=="*30)

    s = '-'.join(str(x) for x in DOE_struct)
    print(f"NN structure: {s}")

    start_time2 = time.time()

    # Create the model
    model = create_model(DOE_struct)

    info_dataset = solve_nn_dataset(model, v0_guess, dataset, NUM_ITE

    # Store info about the NN structure
    nrow = info_dataset.shape[0]
    info_dataset['DOE'] = [DOE_struct]*nrow
    info_dataset['processed'] = [processed_flag]*nrow

    # Append info_dflist
    info_alldataset.append(info_dataset)

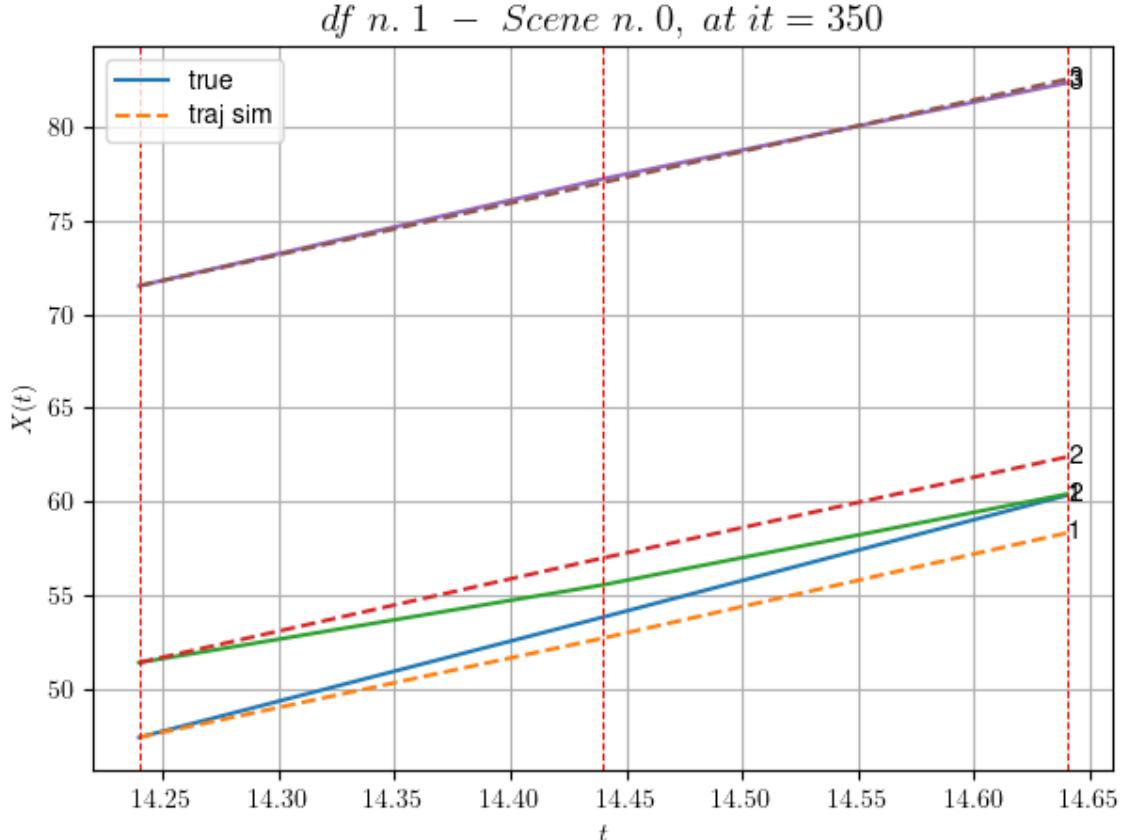
    time_taken=time.time() - start_time2
    print(f"\nTime taken using {s} NN structure: {'{0:.02f}'.format(tim

time_taken=time.time() - start_time1
print(f"\nTime taken for the computation: {'{0:.02f}'.format(time_tak
```

```
=====
NN structure: 1-2-1
=====
*****
***** In df n.1/10 we have 28 scenes *****
***** - Time interval n.0: [14.24, 14.44]
      * y_true: [32.1443344 20.77111865]
      * v_ann: [26.52194595336914, 27.964004516601562, 2
7.63629536512858]

-----
      - Time interval n.1: [14.44, 14.64]
      * y_true: [32.5721373 24.27162308]
      * v_ann: [28.148696899414062, 27.01963996887207, 2
7.63629536512858]

-----
      * err= 1.266913339967216
      * Learning rate NN = 0.0007289999630302191
      * diff = 0.0015123215982650873
```



For scene 0/28

\* use LR\_NN=0.001 with err=18.361335833571175 at it=19  
 \* v0\_scn\_mean = 27.838881482454543  
 \* MAE = 1.266913339967216

---



---

- Time interval n.0: [23.64, 23.84]
  - \* y\_true: [26.6509107 26.65125804]
  - \* v\_ann: [27.51402473449707, 26.672809600830078, 31.184412007415922]

---

- Time interval n.1: [23.84, 24.04]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [27.47565460205078, 26.7515869140625, 31.184412007415922]

---

- Time interval n.2: [24.04, 24.24]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [27.707202911376953, 27.21336555480957, 31.184412007415922]

---

- Time interval n.3: [24.24, 24.44]
  - \* y\_true: [27.07699139 24.80226709]
  - \* v\_ann: [27.908870697021484, 27.95751953125, 31.184412007415922]

4412007415922]

```

-----  

-----  

- Time interval n.4: [24.44, 24.64]  

  * y_true: [27.07699139 24.80226709]  

  * v_ann: [27.761804580688477, 27.696928024291992, 3  

1.184412007415922]
-----
```

```

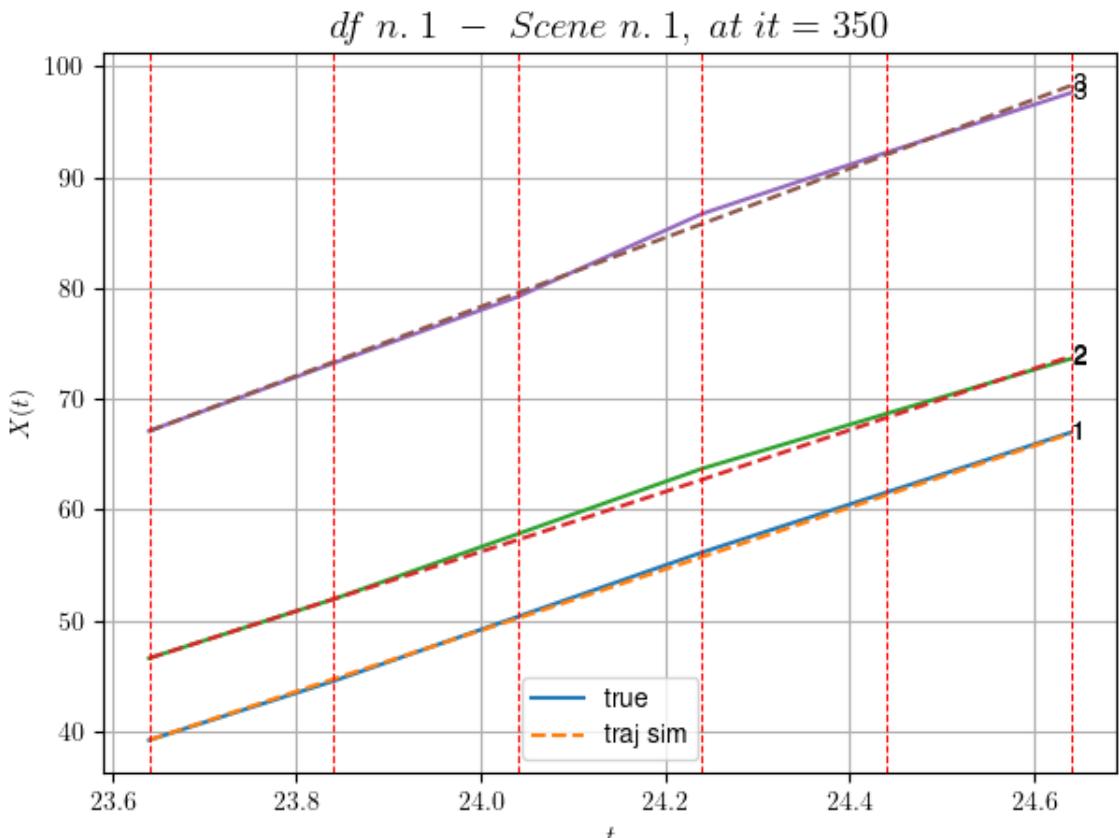
-----  

-----  

  * err= 0.1762258123629531  

  * Learning rate NN = 3.874203684972599e-05  

  * diff = 0.00017228027280677405
-----
```



For scene 1/28

```

* use LR_NN=0.0001 with err=33.93524400863389 at it=19
* v0_scn_mean = 31.08289956531264
* MAE = 0.1762258123629531
=====
```

```

-----  

-----  

- Time interval n.0: [72.44, 72.64]  

  * y_true: [25.85001228 31.10049693]  

  * v_ann: [26.55873680114746, 28.387540817260742, 2  

8.250933212462645]
-----
```

```

-----  

-----  

- Time interval n.1: [72.64, 72.84]  

  * y_true: [30.00006309 33.82077482]  

  * v_ann: [26.986858367919922, 28.796533584594727, 2
-----
```

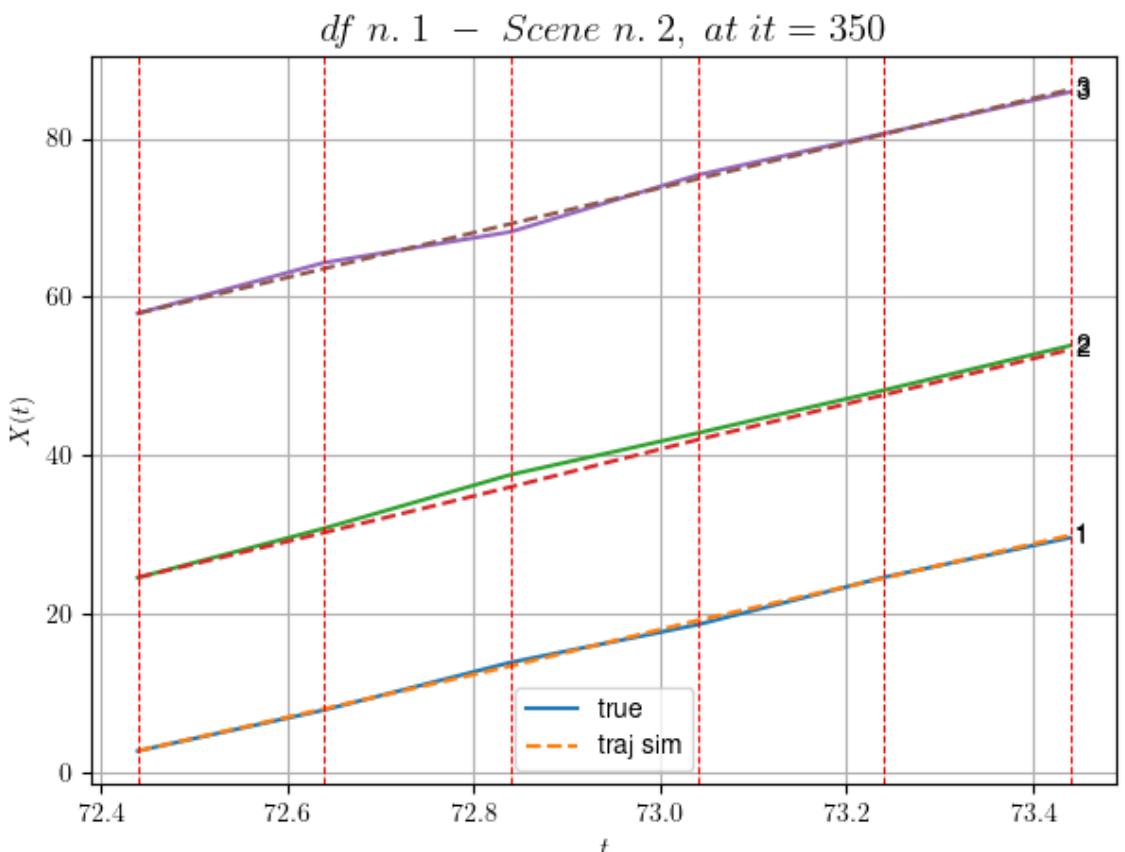
8.250933212462645]

```
- Time interval n.2: [72.84, 73.04]
  * y_true: [23.75011307 26.19081077]
  * v_ann: [28.718860626220703, 29.743515014648438, 2
8.250933212462645]
```

```
- Time interval n.3: [73.04, 73.24]
  * y_true: [29.90025591 27.11111625]
  * v_ann: [26.73848533630371, 28.289011001586914, 2
8.250933212462645]
```

```
- Time interval n.4: [73.24, 73.44]
  * y_true: [25.05033948 28.161422 ]
  * v_ann: [27.09933853149414, 28.611467361450195, 2
8.250933212462645]
```

```
* err= 0.3648271176585351
* Learning rate NN = 3.874203684972599e-05
* diff = 0.0005021686910066658
```



For scene 2/28

```
* use LR_NN=0.0001 with err=3.3552855794797014 at it=19
* v0_scn_mean = 28.400840541916395
* MAE = 0.29557278952892835
```

```

=====
=====

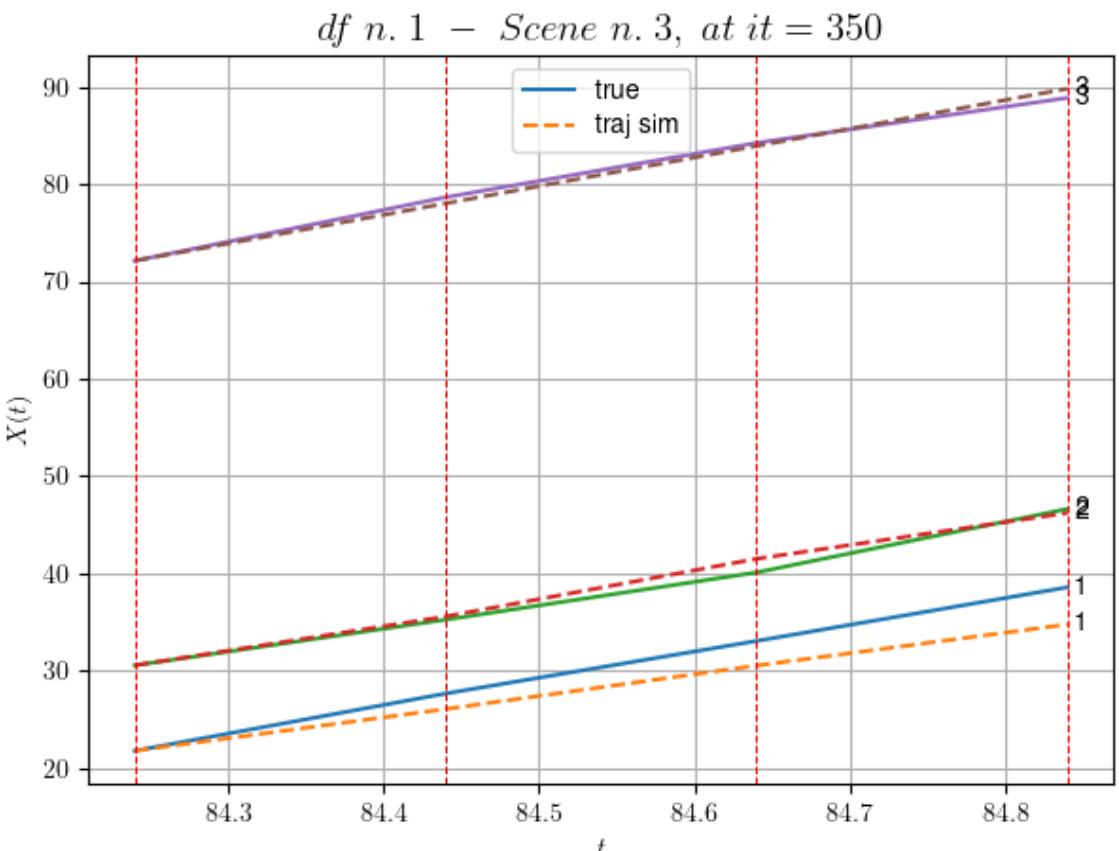
    - Time interval n.0: [84.24, 84.44]
      * y_true: [29.4403562 23.48047527]
      * v_ann: [21.47234535217285, 25.114160537719727, 2
9.49436924721101]

-----
    - Time interval n.1: [84.44, 84.64]
      * y_true: [27.01049004 24.28067739]
      * v_ann: [22.33160972595215, 29.652450561523438, 2
9.49436924721101]

-----
    - Time interval n.2: [84.64, 84.84]
      * y_true: [27.60069732 32.65118399]
      * v_ann: [21.15283203125, 23.575313568115234, 29.49
436924721101]

-----
* err= 2.2629896962891247
* Learning rate NN = 0.0002952449722215533
* diff = 0.20865360976038083

```



For scene 3/28

```

* use LR_NN=0.0005 with err=25.098945309285444 at it=19
* v0_scn_mean = 29.53770536014881
* MAE = 1.2036013430973638

```

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- Time interval n.0: [131.64, 131.84]
  - \* y\_true: [30.80073929 29.11067519]
  - \* v\_ann: [26.808828353881836, 22.302427291870117, 2

8.442903953643]

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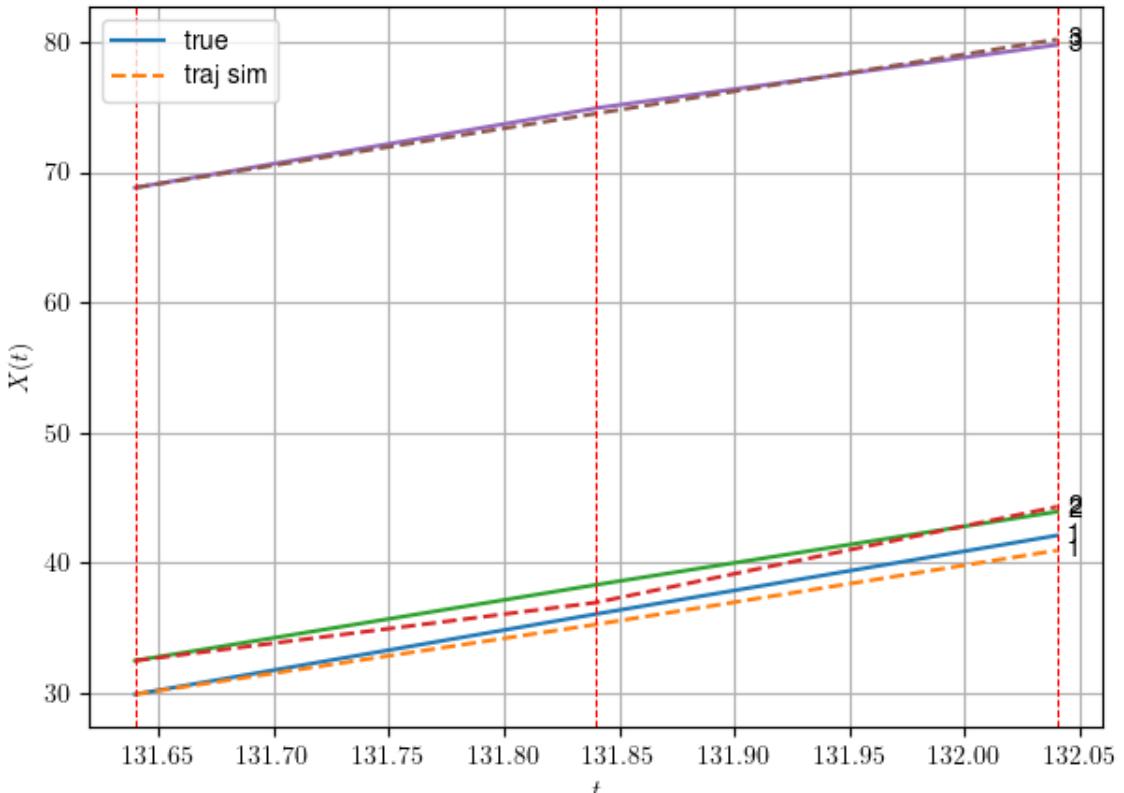
- Time interval n.1: [131.84, 132.04]
  - \* y\_true: [30.16079766 28.07097758]
  - \* v\_ann: [28.42342758178711, 36.773868560791016, 2

8.442903953643]

---

- \* err= 0.47732157764579314
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.008444042453425282

*df n. 1 – Scene n. 4, at it = 350*



For scene 4/28

- \* use LR\_NN=0.0005 with err=17.601005173596132 at it=19
- \* v0\_scn\_mean = 28.57635803994525
- \* MAE = 0.4186264695326045

---



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- Time interval n.0: [148.04, 148.24]
  - \* y\_true: [21.93113488 25.90203153]
  - \* v\_ann: [26.209501266479492, 26.214340209960938, 2

7.62167390672513]

---

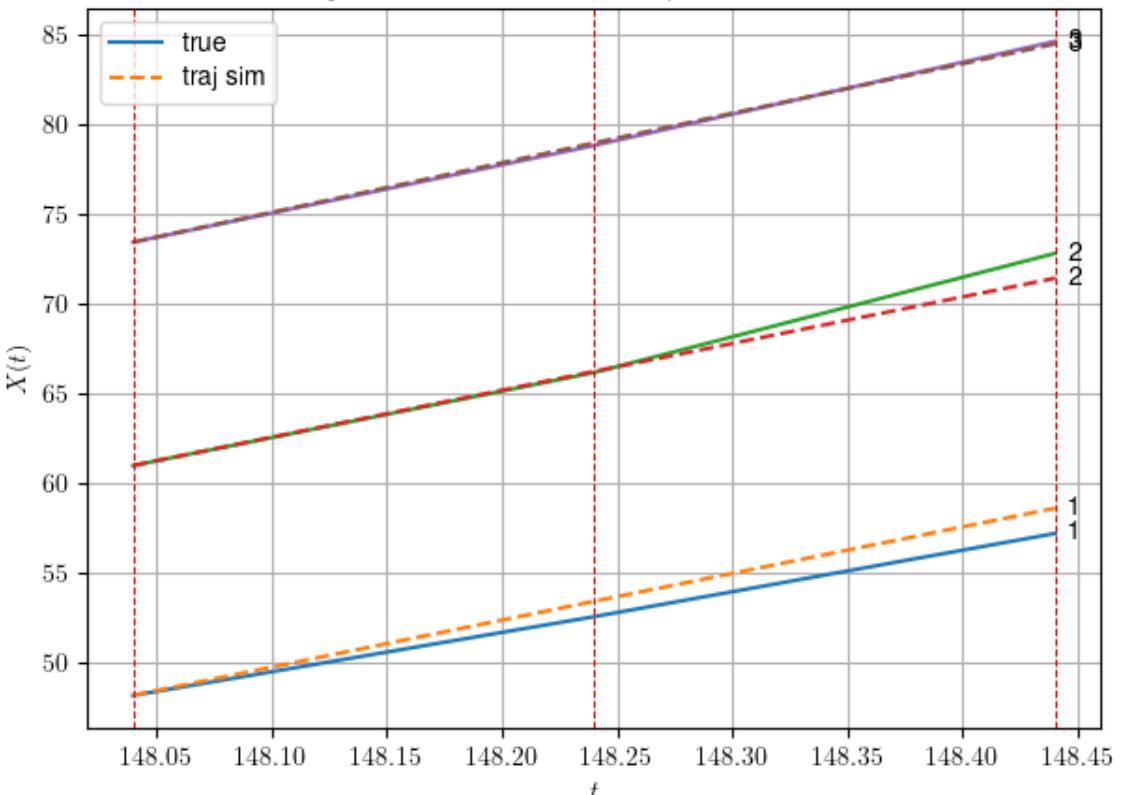
- Time interval n.1: [148.24, 148.44]
  - \* y\_true: [23.17638158 33.20310746]
  - \* v\_ann: [25.936983108520508, 25.96316909790039, 2

7.62167390672513]

---

- \* err= 0.5196930508019525
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.00011393117864089142

*df n. 1 – Scene n. 5, at it = 350*



For scene 5/28

- \* use LR\_NN=0.0001 with err=0.8115644845597109 at it=19
- \* v0 scn mean = 27.825513185907507
- \* MAE = 0.5169543055355343

---



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- Time interval n.0: [161.64, 161.84]
  - \* y\_true: [31.66062591 25.70084842]
  - \* v\_ann: [28.62908172607422, 28.537090301513672, 3

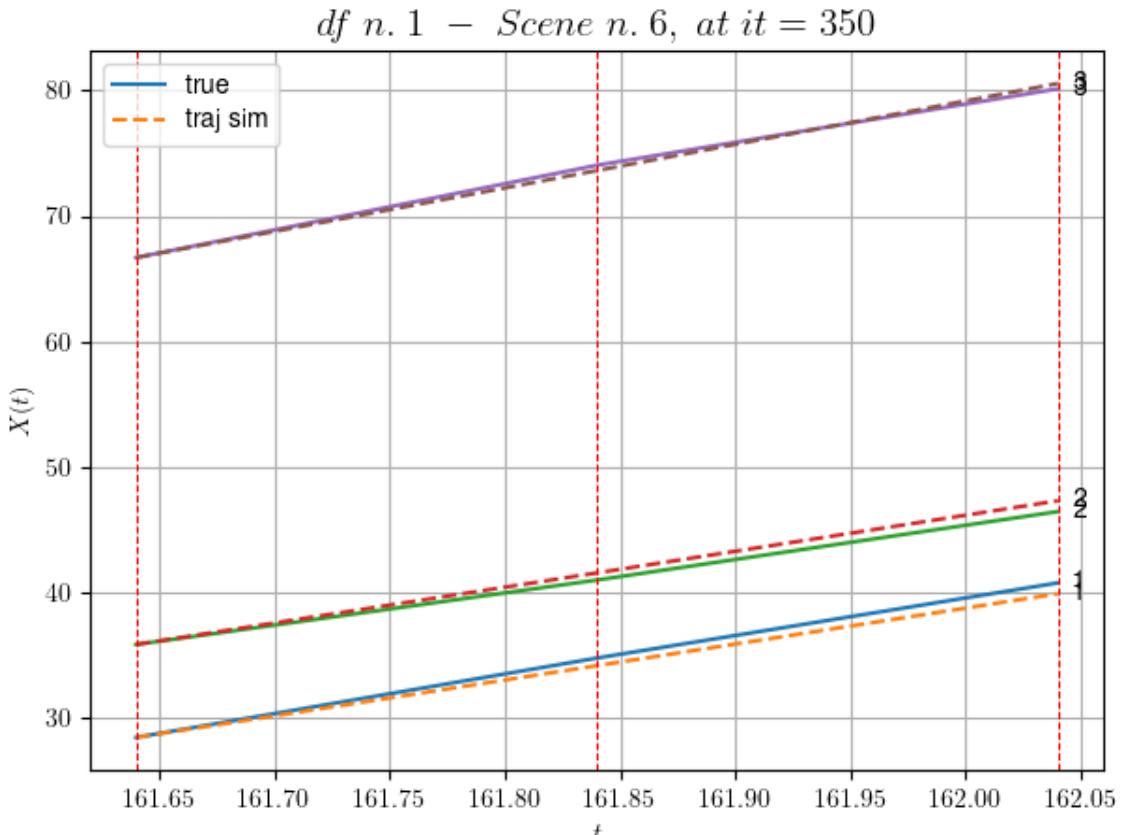
4.71178115125162]

---

- Time interval n.1: [161.84, 162.04]
  - \* y\_true: [29.96082912 27.30094687]
  - \* v\_ann: [28.6909122467041, 28.765077590942383, 34.

71178115125162]

```
-----  
-----  
* err= 0.2808525506434593  
* Learning rate NN = 0.00036449998151510954  
* diff = 4.471205680025532e-07
```



For scene 6/28

```
* use LR_NN=0.0005 with err=13.10752025361149 at it=19  
* v0_scn_mean = 34.30794835630691  
* MAE = 0.2577331558229889
```

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For scene 7/28

```
* use LR_NN=0.0005 with err=1.494595592392726 at it=19  
* v0_scn_mean = 32.140969810118825  
* MAE = 3.749294805530107
```

---



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For scene 8/28

```
* use LR_NN=0.0005 with err=1.8602995113307552 at it=19  
* v0_scn_mean = 36.50803476622434  
* MAE = 45.21914520773556
```

---



---

```

    - Time interval n.0: [216.64, 216.84]
      * y_true: [37.52054047 34.13112536]
      * v_ann: [35.9346923828125, 36.745849609375, 34.851
7900522816]
```

---

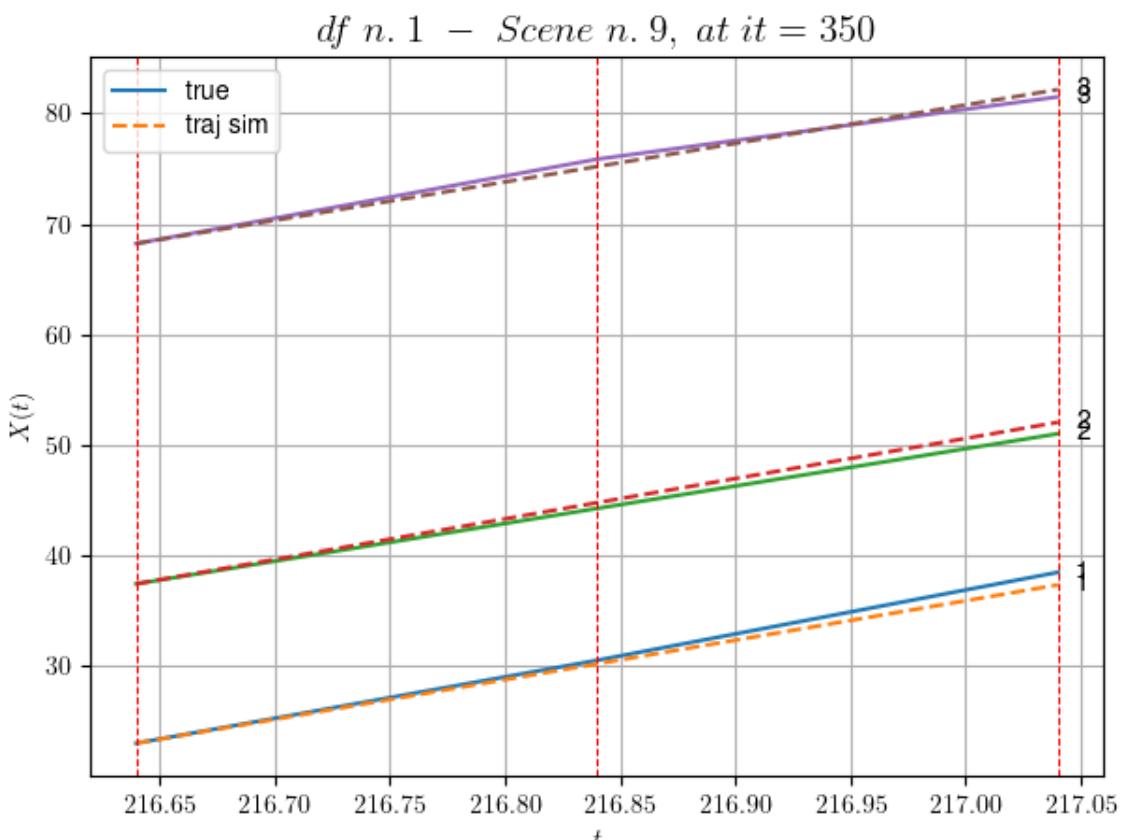
```

    - Time interval n.1: [216.84, 217.04]
      * y_true: [39.83095433 33.81148861]
      * v_ann: [35.71519088745117, 36.38134765625, 34.851
7900522816]
```

---

```

      * err= 0.4038875473855857
      * Learning rate NN = 7.289998757187277e-05
      * diff = 0.005993566355524116
```



For scene 9/28

```

* use LR_NN=0.0001 with err=9.661024143728232 at it=19
* v0_scn_mean = 34.43595750947035
* MAE = 0.4038875473855857
```

---



---

```

    - Time interval n.0: [240.64, 240.84]
      * y_true: [28.54090912 24.62265201]
      * v_ann: [39.24374771118164, 28.972070693969727, 3
3.344745672340764]
```

---



---

```

- Time interval n.1: [240.84, 241.04]
  * y_true: [33.36143299 35.0745887 ]
  * v_ann: [22.661218643188477, 23.243833541870117, 3
  3.344745672340764]

```

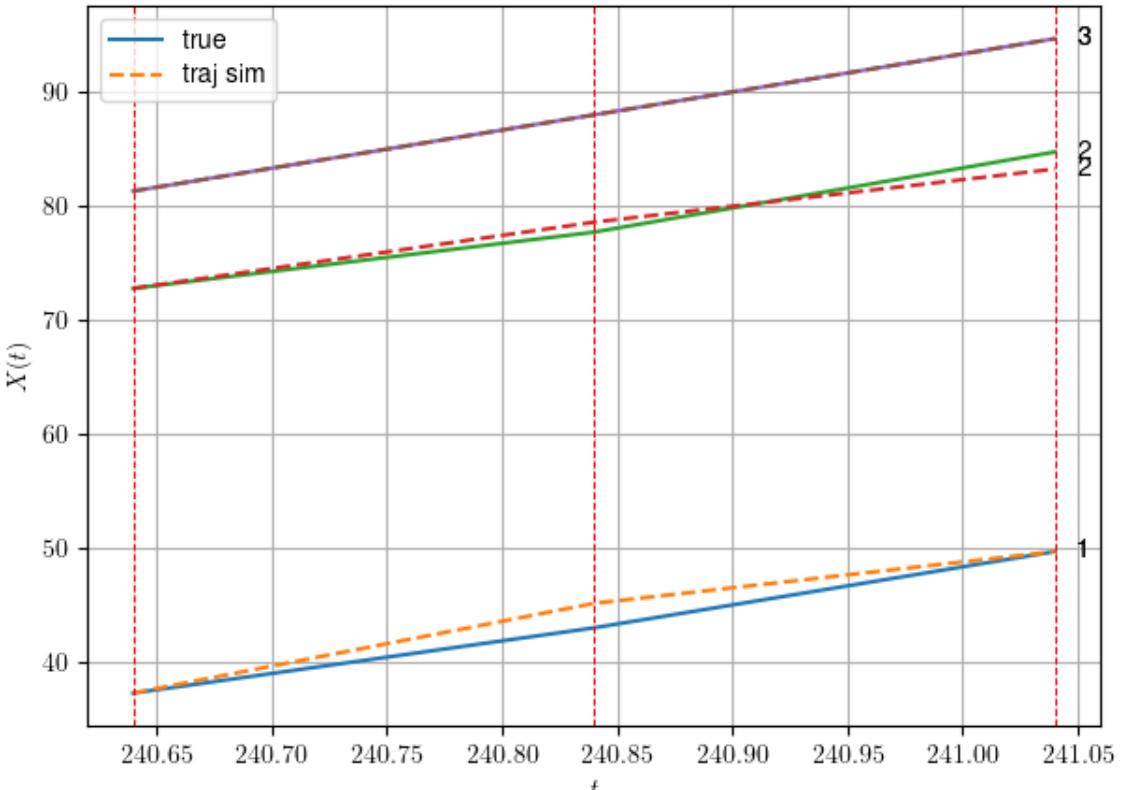
---

```

* err= 0.8419600738184988
* Learning rate NN = 0.00036449998151510954
* diff = 0.0038974257338599827

```

*df n. 1 – Scene n. 10, at it = 350*



For scene 10/28

```

* use LR_NN=0.0005 with err=10.383226221197436 at it=19
* v0_scn_mean = 33.058077435876
* MAE = 0.8419600738184988

```

---



---

```

- Time interval n.0: [253.64, 253.84]
  * y_true: [26.81042151 28.10122634]
  * v_ann: [30.268775939941406, 31.360107421875, 27.4
  74897828444977]

```

---

```

- Time interval n.1: [253.84, 254.04]
  * y_true: [31.5007643 35.35225595]
  * v_ann: [29.523160934448242, 30.20036506652832, 2
  7.474897828444977]

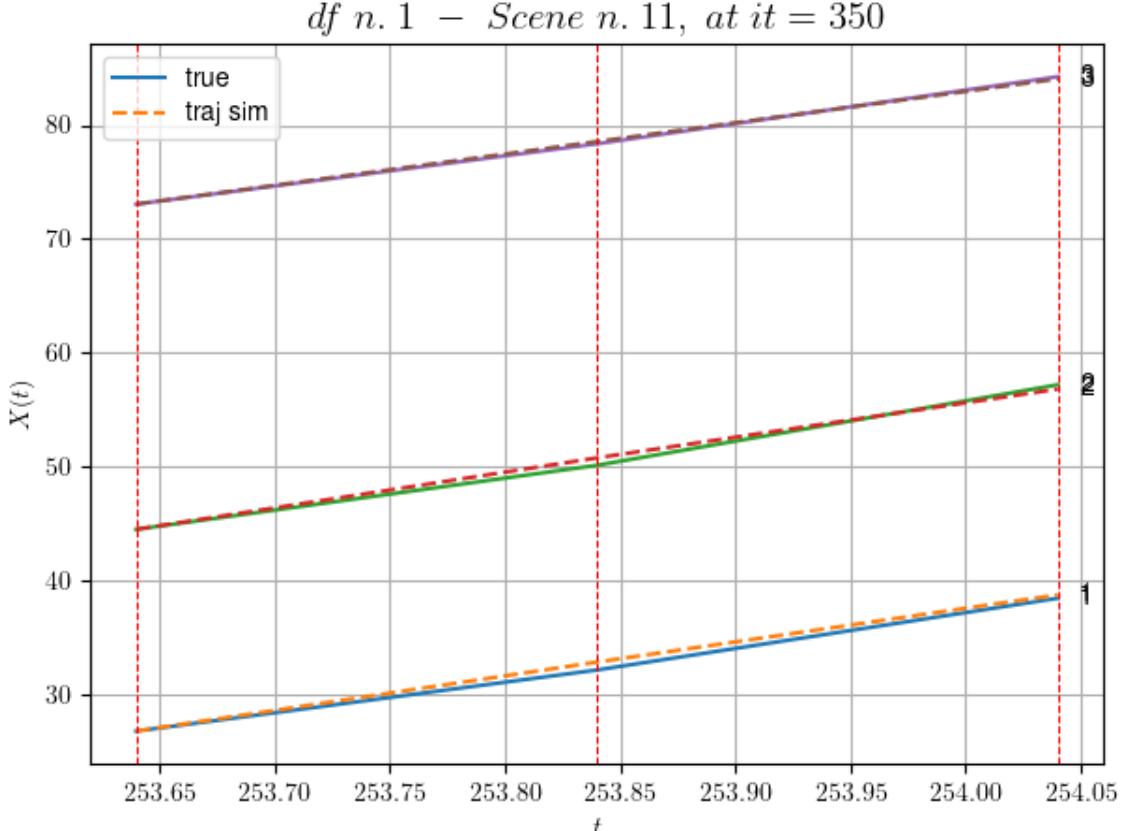
```

---



---

```
* err= 0.13486317678134085
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0006999297003928706
```



For scene 11/28

```
* use LR_NN=0.0001 with err=1.5396942933878064 at it=19
* v0_scn_mean = 27.691316850196014
* MAE = 0.1159250488254303
```

---



---

- Time interval n.0: [262.64, 262.84]  
 \* y\_true: [36.75102901 34.57147294]  
 \* v\_ann: [30.913362503051758, 30.733163833618164, 3  
 5.93105457035001]

---

- Time interval n.1: [262.84, 263.04]  
 \* y\_true: [20.65076329 34.76181544]  
 \* v\_ann: [31.78126335144043, 32.13803482055664, 35.  
 93105457035001]

---

- Time interval n.2: [263.04, 263.24]  
 \* y\_true: [40.30193432 23.95156631]  
 \* v\_ann: [30.95956039428711, 30.84438705444336, 35.  
 93105457035001]

---

```

- Time interval n.3: [263.24, 263.44]
  * y_true: [32.10201673 27.4721836 ]
  * v_ann: [31.2401123046875, 31.265846252441406, 35.
93105457035001]

```

---

```

- Time interval n.4: [263.44, 263.64]
  * y_true: [17.75131644 43.4543127 ]
  * v_ann: [30.99020767211914, 30.70709800720215, 35.
93105457035001]

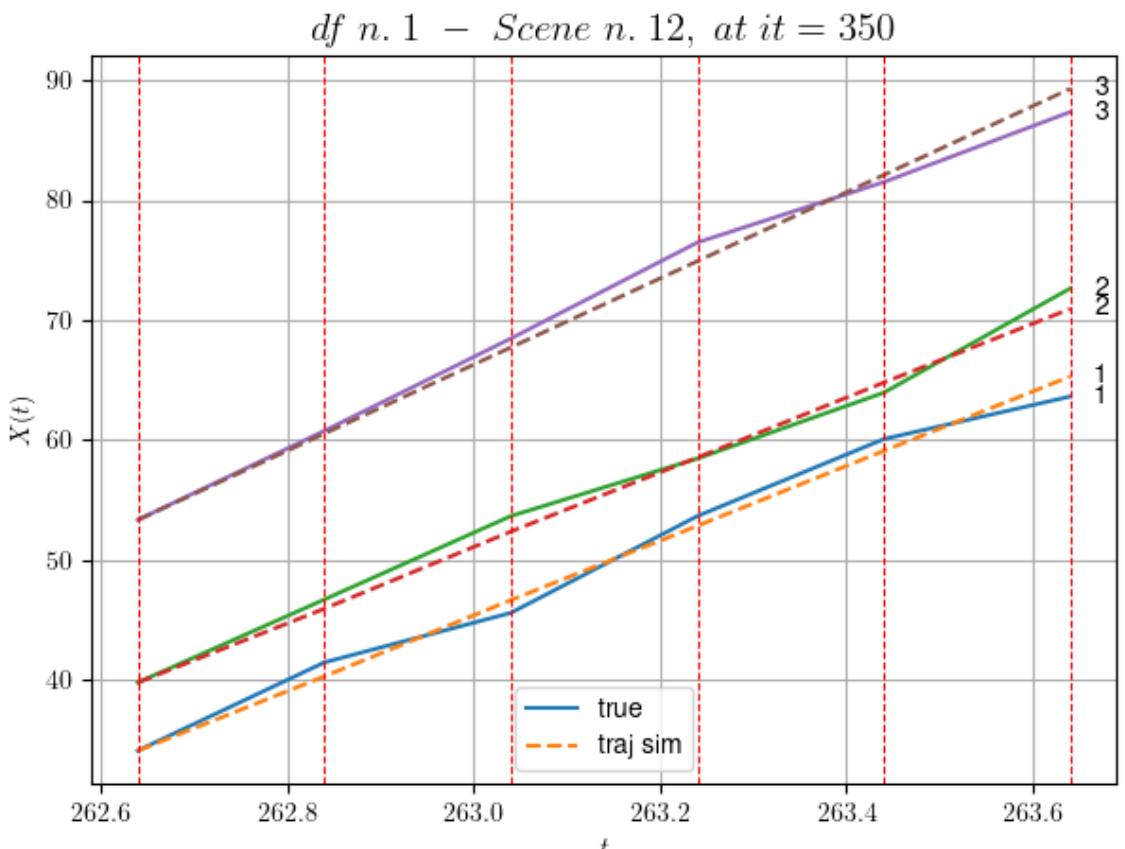
```

---

```

* err= 1.1045637396326033
* Learning rate NN = 0.0001937102060765028
* diff = 0.0001126776379340999

```



For scene 12/28

```

* use LR_NN=0.0005 with err=37.775669977645116 at it=19
* v0_scn_mean = 35.42272146505013
* MAE = 1.0552395748772383

```

---



---

```

- Time interval n.0: [314.84, 315.04]
  * y_true: [29.62016755 31.54681236]
  * v_ann: [29.99666976928711, 29.69679832458496, 30.
926241166015267]

```

---



---

```

    - Time interval n.1: [315.04, 315.24]
      * y_true: [30.12030665 32.32740505]
      * v_ann: [31.0399227142334, 30.210769653320312, 30.
926241166015267]
```

---

```

    - Time interval n.2: [315.24, 315.44]
      * y_true: [25.99040223 31.02242591]
      * v_ann: [31.755496978759766, 30.494863510131836, 3
0.926241166015267]
```

---

```

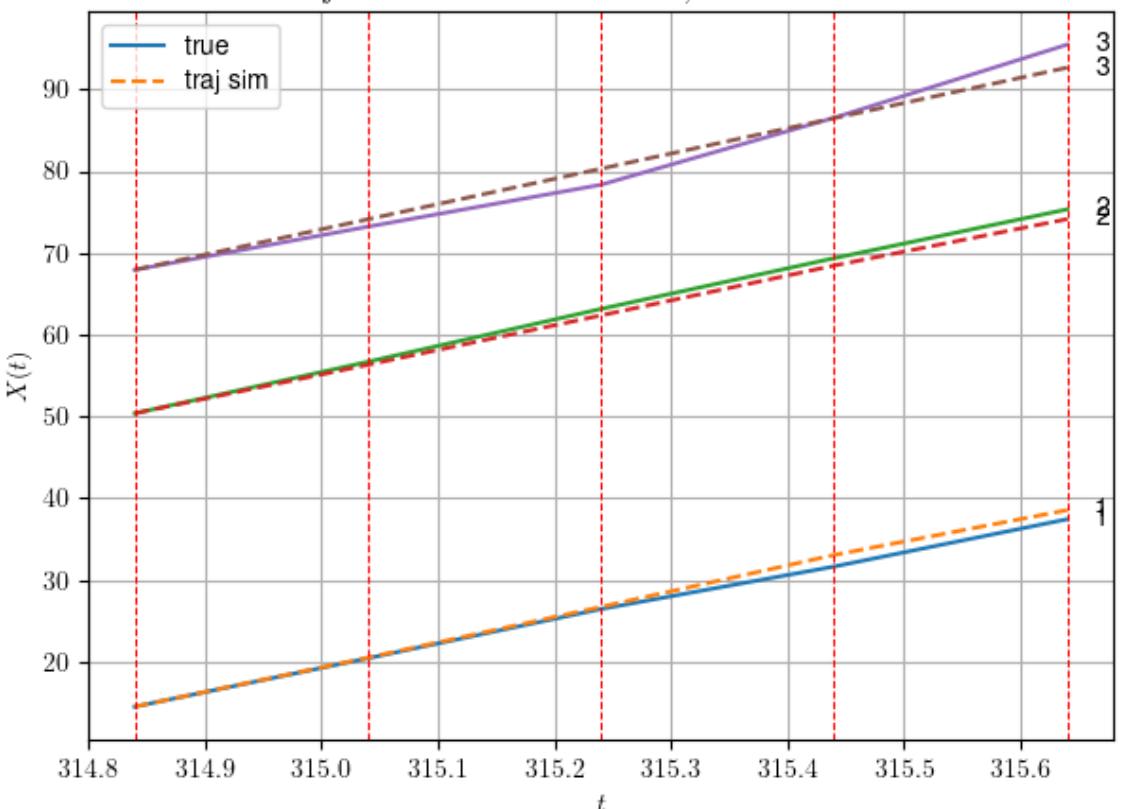
    - Time interval n.3: [315.44, 315.64]
      * y_true: [28.95064907 29.88823464]
      * v_ann: [27.46592903137207, 28.41474723815918, 30.
926241166015267]
```

---

```

* err= 1.260596852636981
* Learning rate NN = 0.000239148415857926
* diff = 0.0011552092425484162
```

*df n. 1 – Scene n. 13, at it = 350*



For scene 13/28

```

* use LR_NN=0.0005 with err=22.808847010003216 at it=19
* v0_scn_mean = 30.846855781410756
* MAE = 1.260596852636981
```

---



---

```
- Time interval n.0: [325.24, 325.44]
  * y_true: [29.06068603 28.85087529]
  * v_ann: [29.18709945678711, 28.55873680114746, 29.
804035226087446]

-----
- Time interval n.1: [325.44, 325.64]
  * y_true: [28.37089255 31.80128105]
  * v_ann: [29.22136116027832, 28.459264755249023, 2
9.804035226087446]

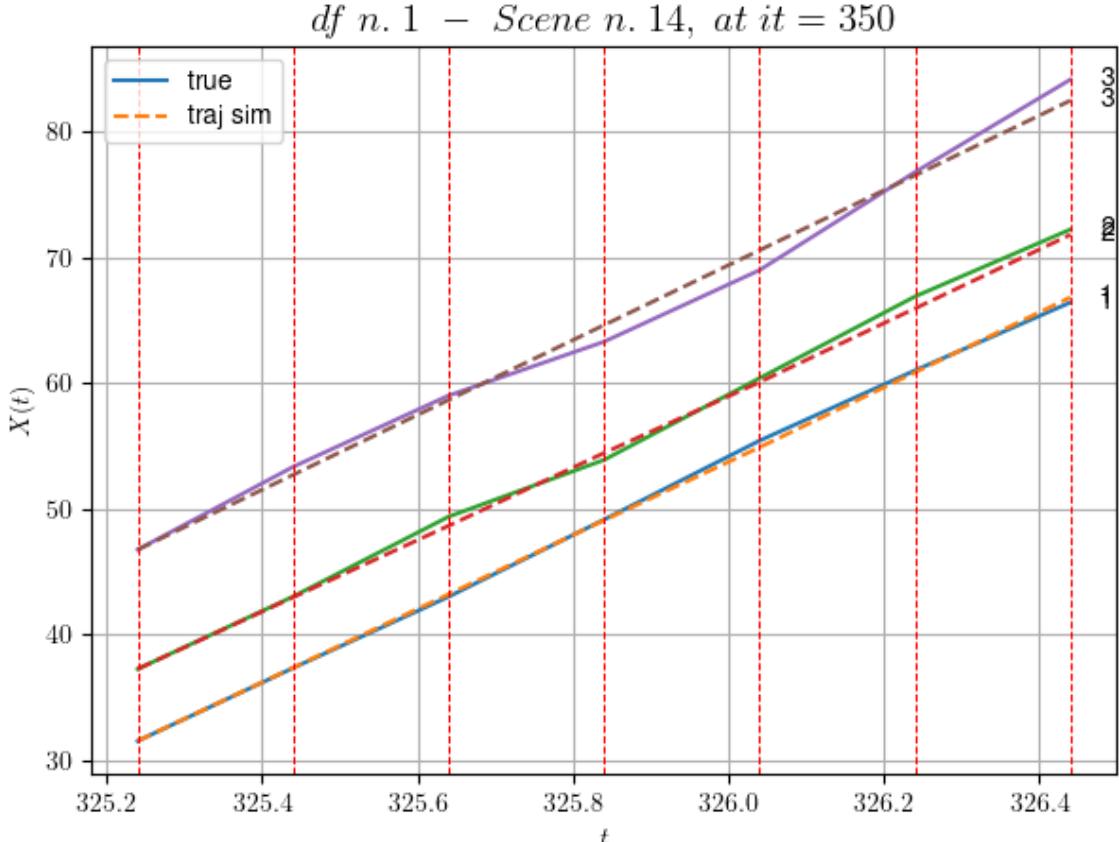
-----
- Time interval n.2: [325.64, 325.84]
  * y_true: [30.70143178 22.60113815]
  * v_ann: [29.458234786987305, 28.986793518066406, 2
9.804035226087446]

-----
- Time interval n.3: [325.84, 326.04]
  * y_true: [31.42655806 32.52725213]
  * v_ann: [29.05291748046875, 28.209245681762695, 2
9.804035226087446]

-----
- Time interval n.4: [326.04, 326.24]
  * y_true: [27.9669351 32.52725213]
  * v_ann: [29.832183837890625, 29.335712432861328, 2
9.804035226087446]

-----
- Time interval n.5: [326.24, 326.44]
  * y_true: [27.10202936 26.72764736]
  * v_ann: [29.882333755493164, 29.370147705078125, 2
9.804035226087446]

-----
* err= 0.48480892233238376
* Learning rate NN = 0.00031381050939671695
* diff = 5.280513469924086e-05
```



For scene 14/28

- \* use LR\_NN=0.001 with err=17.52453876072967 at it=19
- \* v0\_scn\_mean = 29.820830785944782
- \* MAE = 0.48216353113705646

---



---

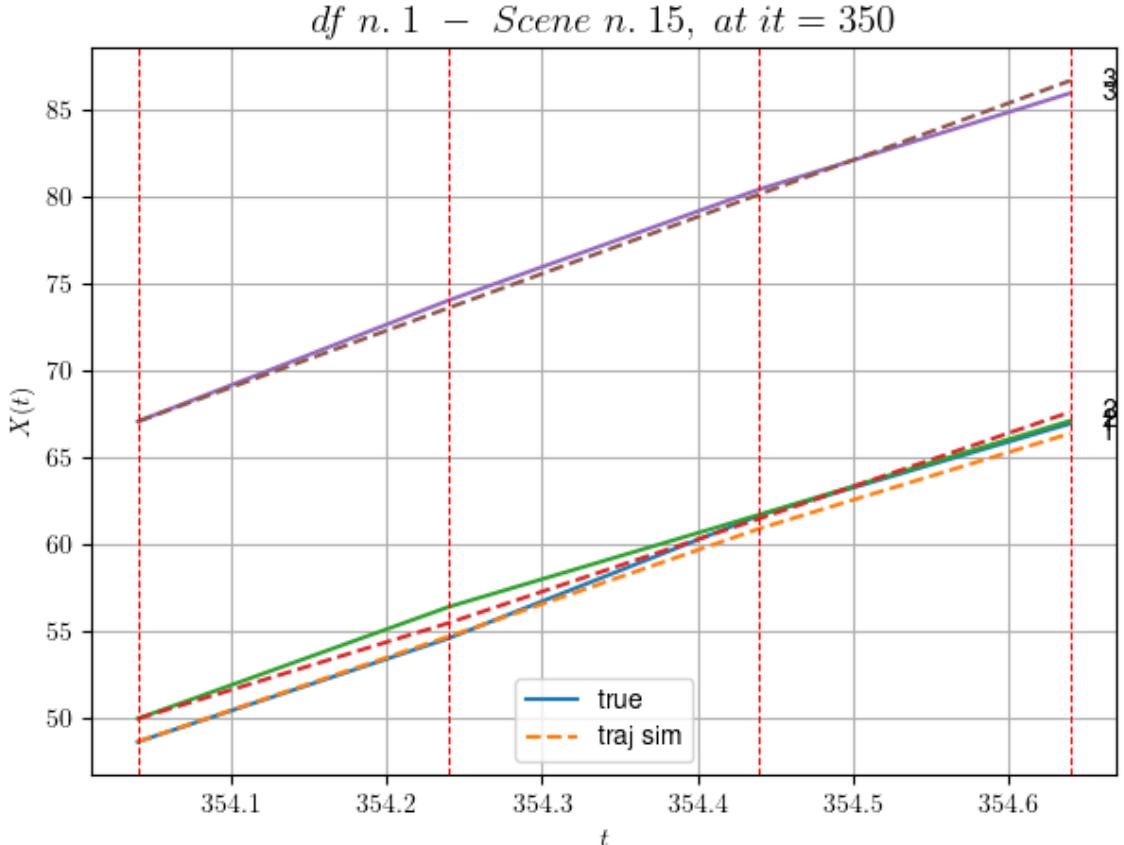
- Time interval n.0: [354.04, 354.24]
  - \* y\_true: [29.77169216 32.15176545]
  - \* v\_ann: [30.27695655822754, 27.530040740966797, 32.69350270999615]
- Time interval n.1: [354.24, 354.44]
  - \* y\_true: [35.38251939 26.55179403]
  - \* v\_ann: [31.062744140625, 30.02081298828125, 32.69350270999615]
- Time interval n.2: [354.44, 354.64]
  - \* y\_true: [26.40441101 27.01000163]
  - \* v\_ann: [27.38876724243164, 30.687009811401367, 32.69350270999615]

\* err= 0.23857988964950103  
 \* Learning rate NN = 0.0005904899444431067  
 \* diff = 0.0010665546142107074

---



---



For scene 15/28

```
* use LR_NN=0.001 with err=22.50549207173529 at it=19
* v0_scn_mean = 32.46265057729916
* MAE = 0.23857988964950103
```

---



---

```
- Time interval n.0: [363.44, 363.64]
* y_true: [23.6502752 28.55056389]
* v_ann: [28.68557357788086, 29.45871353149414, 38.
923429963342706]
```

---

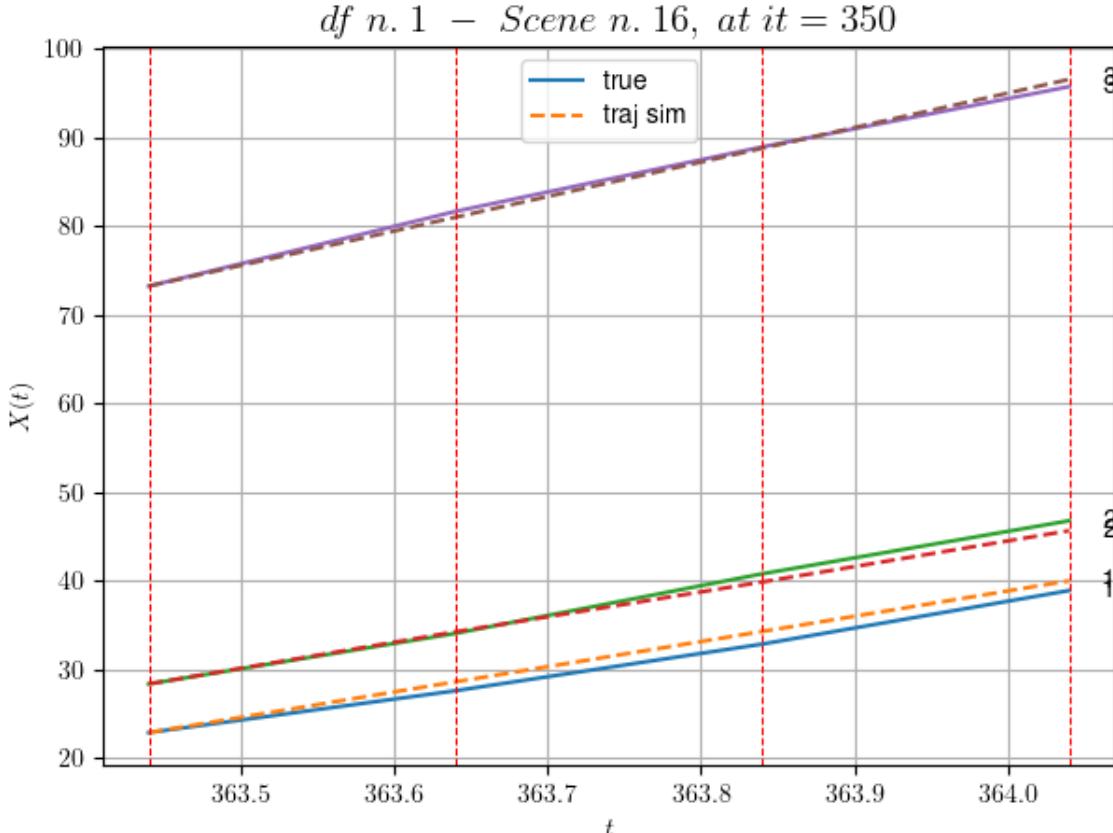
```
- Time interval n.1: [363.64, 363.84]
* y_true: [26.3393983 33.66093634]
* v_ann: [28.424564361572266, 28.134185791015625, 3
8.923429963342706]
```

---

```
- Time interval n.2: [363.84, 364.04]
* y_true: [30.2407755 29.94110461]
* v_ann: [28.601394653320312, 28.958768844604492, 3
8.923429963342706]
```

---

```
* err= 0.6263145538012406
* Learning rate NN = 5.904899080633186e-05
* diff = 0.00015453018856481648
```



For scene 16/28

```
* use LR_NN=0.0001 with err=24.26447309319103 at it=19
* v0_scn_mean = 38.158629233659326
* MAE = 0.61260171950178
```

---



---

```
- Time interval n.0: [386.64, 386.84]
* y_true: [28.15052447 34.1607672 ]
* v_ann: [34.57210159301758, 36.51673126220703, 39.
34603263427208]
```

---

```
- Time interval n.1: [386.84, 387.04]
* y_true: [34.00091123 38.91120777]
* v_ann: [32.53606033325195, 30.913864135742188, 3
9.34603263427208]
```

---

```
- Time interval n.2: [387.04, 387.24]
* y_true: [32.52639997 34.00151192]
* v_ann: [34.848636627197266, 37.03892135620117, 3
9.34603263427208]
```

---

```
- Time interval n.3: [387.24, 387.44]
* y_true: [32.52639997 39.36234046]
* v_ann: [33.300567626953125, 32.87932205200195, 3
```

9.34603263427208]

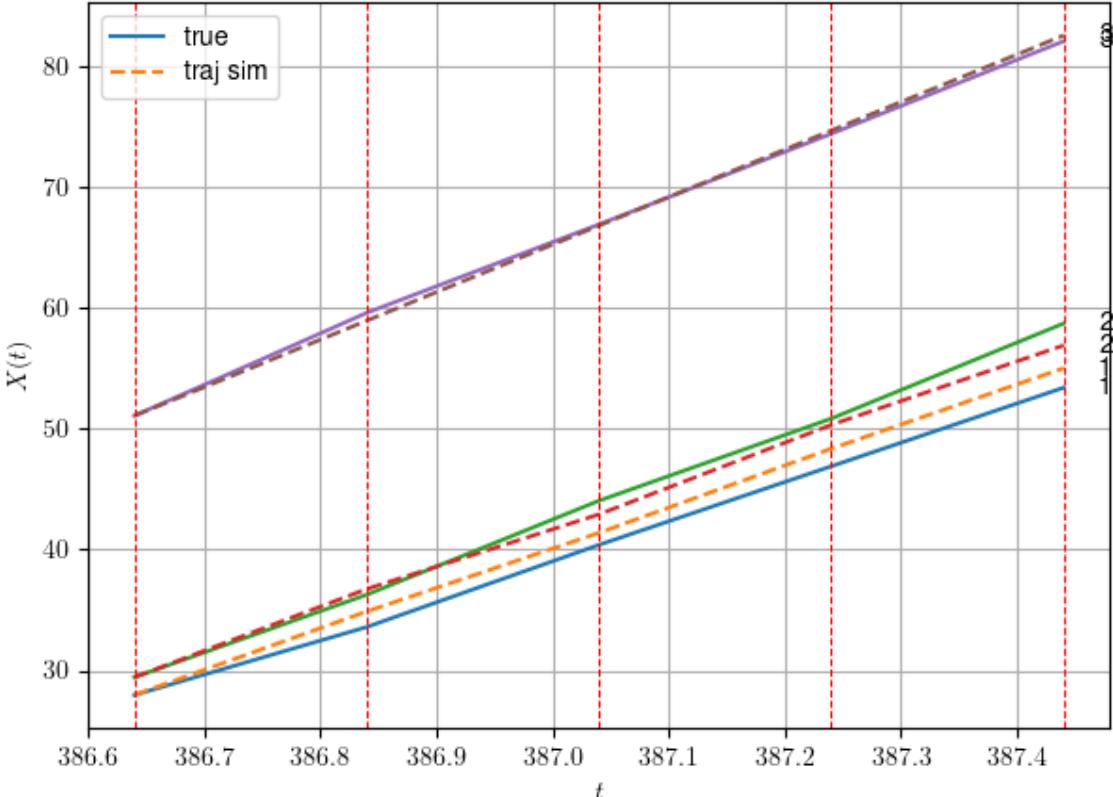
---



---

```
* err= 0.8761050091917763
* Learning rate NN = 0.000478296831715852
* diff = 8.237671628452681e-05
```

*df n. 1 – Scene n. 17, at it = 350*



For scene 17/28

```
* use LR_NN=0.001 with err=50.7026466443458 at it=19
* v0_scn_mean = 38.54501188242043
* MAE = 0.6809730394074517
```

---



---

```
- Time interval n.0: [431.84, 432.04]
* y_true: [30.8908033 31.49166882]
* v_ann: [32.25456237792969, 32.266876220703125, 3
0.084161028049007]
```

---



---

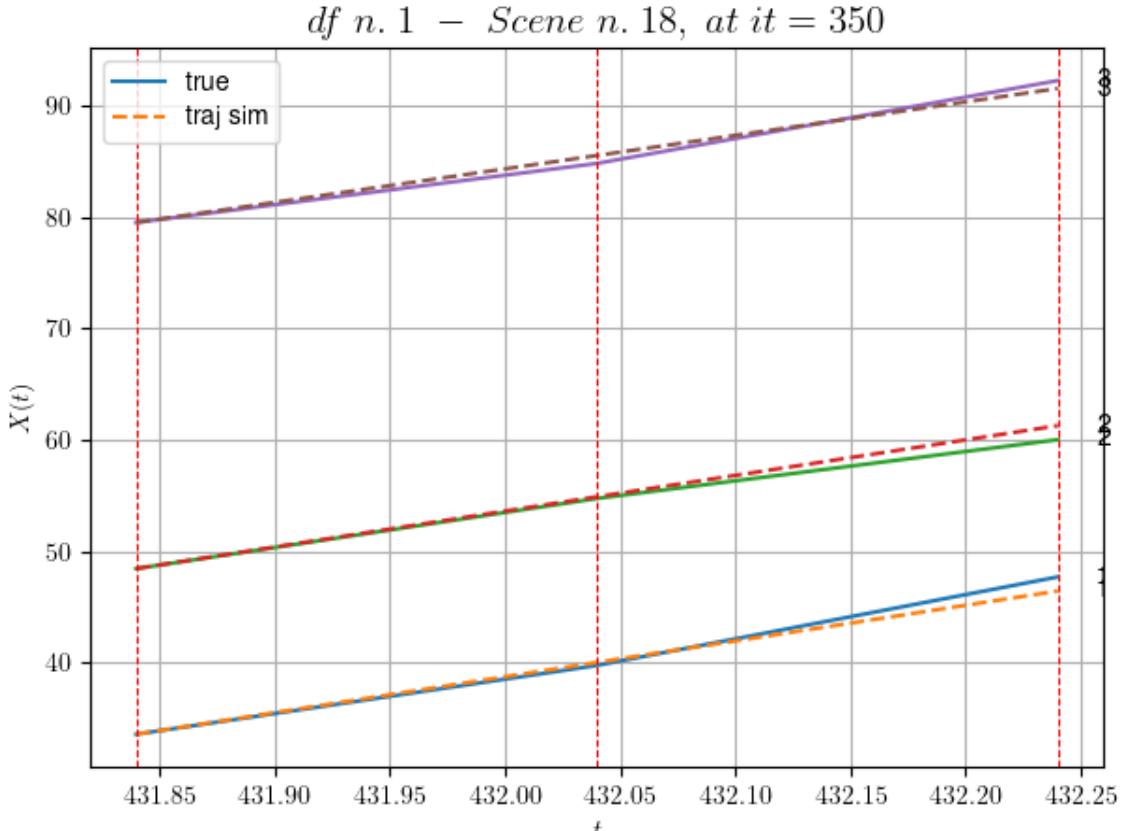
```
- Time interval n.1: [432.04, 432.24]
* y_true: [39.73151551 26.376716 ]
* v_ann: [32.04884338378906, 31.913707733154297, 3
0.084161028049007]
```

---



---

```
* err= 0.4778664262281374
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00014578111096164026
```



For scene 18/28

```
* use LR_NN=0.0001 with err=7.158051420389246 at it=19
* v0_scn_mean = 30.076947835820985
* MAE = 0.40390158551330907
```

---



---

```
- Time interval n.0: [446.24, 446.44]
* y_true: [25.89017971 23.30046083]
* v_ann: [25.390182495117188, 24.757917404174805, 2
9.554432428746026]
```

---

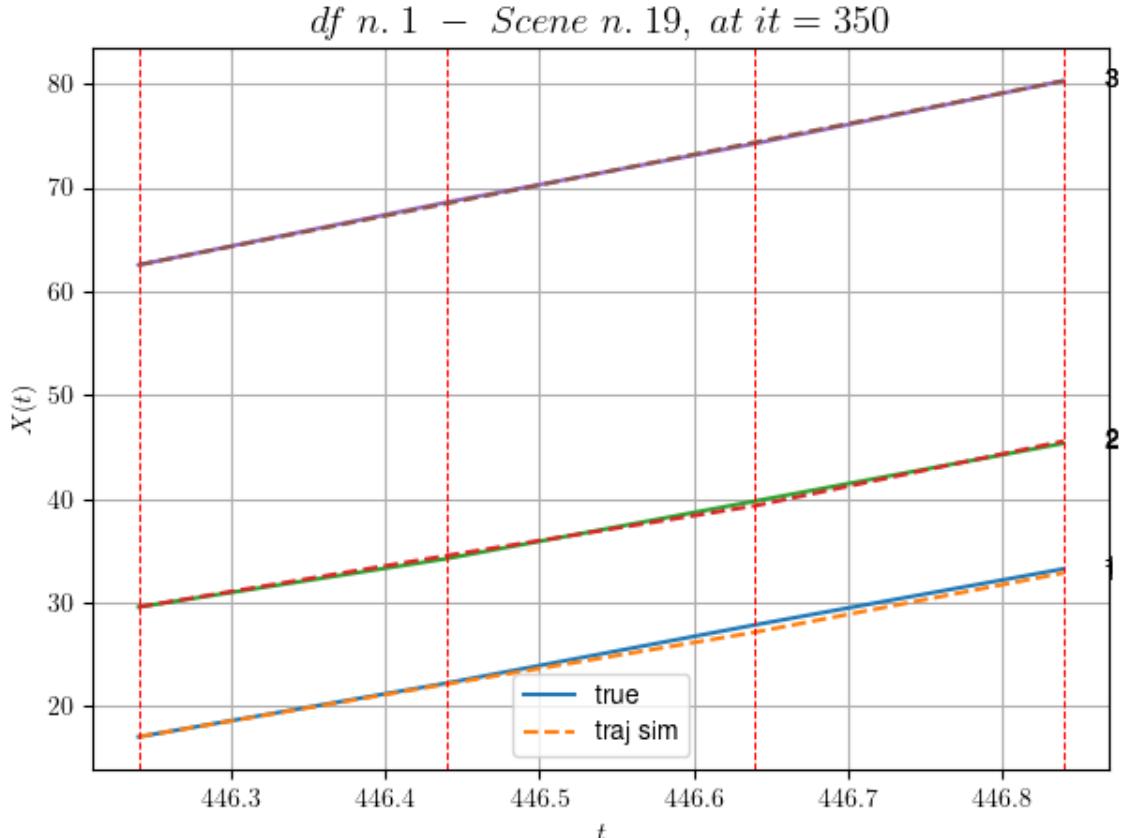
```
- Time interval n.1: [446.44, 446.64]
* y_true: [28.05031625 27.72075411]
* v_ann: [25.005674362182617, 24.00605583190918, 2
9.554432428746026]
```

---

```
- Time interval n.2: [446.64, 446.84]
* y_true: [26.94045507 27.8009832 ]
* v_ann: [28.53337860107422, 31.127452850341797, 2
9.554432428746026]
```

---

```
* err= 0.08611122418695978
* Learning rate NN = 0.0005904899444431067
* diff = 1.6028288149561032e-05
```



For scene 19/28

```
* use LR_NN=0.001 with err=12.34442723966712 at it=19
* v0_scn_mean = 29.592620704444073
* MAE = 0.08385242989012925
```

---



---

```
- Time interval n.0: [447.44, 447.64]
* y_true: [31.0713577 29.31148494]
* v_ann: [27.90363883972168, 28.111722946166992, 3
2.58484136741293]
```

---

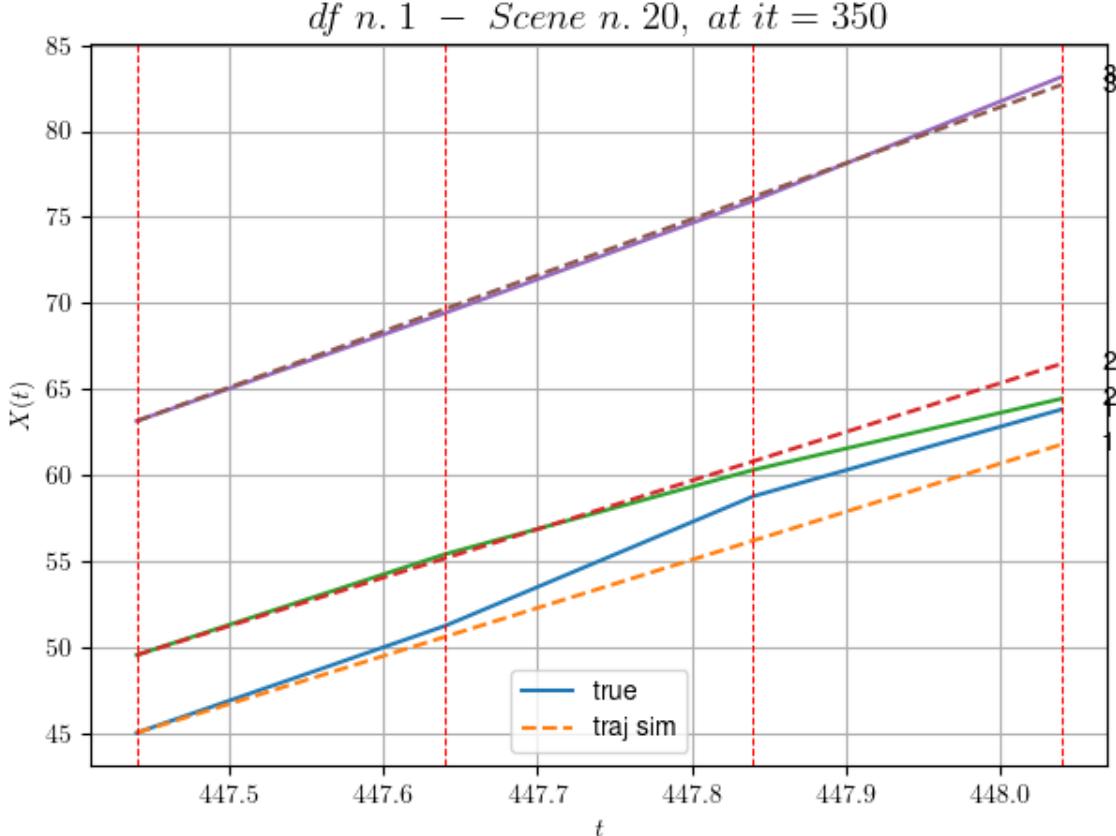
```
- Time interval n.1: [447.64, 447.84]
* y_true: [37.68225285 24.50151408]
* v_ann: [27.95956802368164, 28.20635223388672, 32.
58484136741293]
```

---

```
- Time interval n.2: [447.84, 448.04]
* y_true: [25.261801 20.71149408]
* v_ann: [27.97406578063965, 28.369665145874023, 3
2.58484136741293]
```

---

```
* err= 1.3294802919813236
* Learning rate NN = 2.952449540316593e-05
* diff = 8.901611153744327e-05
```



For scene 20/28

```
* use LR_NN=5e-05 with err=26.35719975124376 at it=19
* v0_scn_mean = 32.36330227627491
* MAE = 1.3294802919813236
```

---



---

For scene 21/28

```
* use LR_NN=0.001 with err=2.5834202727791644 at it=19
* v0_scn_mean = 24.166541486145263
* MAE = 0.8704994300181091
```

---



---

```
- Time interval n.0: [496.84, 497.04]
  * y_true: [19.47545433 17.05100655]
  * v_ann: [18.235675811767578, 18.1204833984375, 23.
671067862249377]
```

---

```
- Time interval n.1: [497.04, 497.24]
  * y_true: [13.44536038 20.12642582]
  * v_ann: [18.254806518554688, 18.15828514099121, 2
3.671067862249377]
```

---

```
- Time interval n.2: [497.24, 497.44]
```

```

* y_true: [18.49565962 22.17670532]
* v_ann: [17.80866813659668, 17.8038387298584, 23.6
71067862249377]

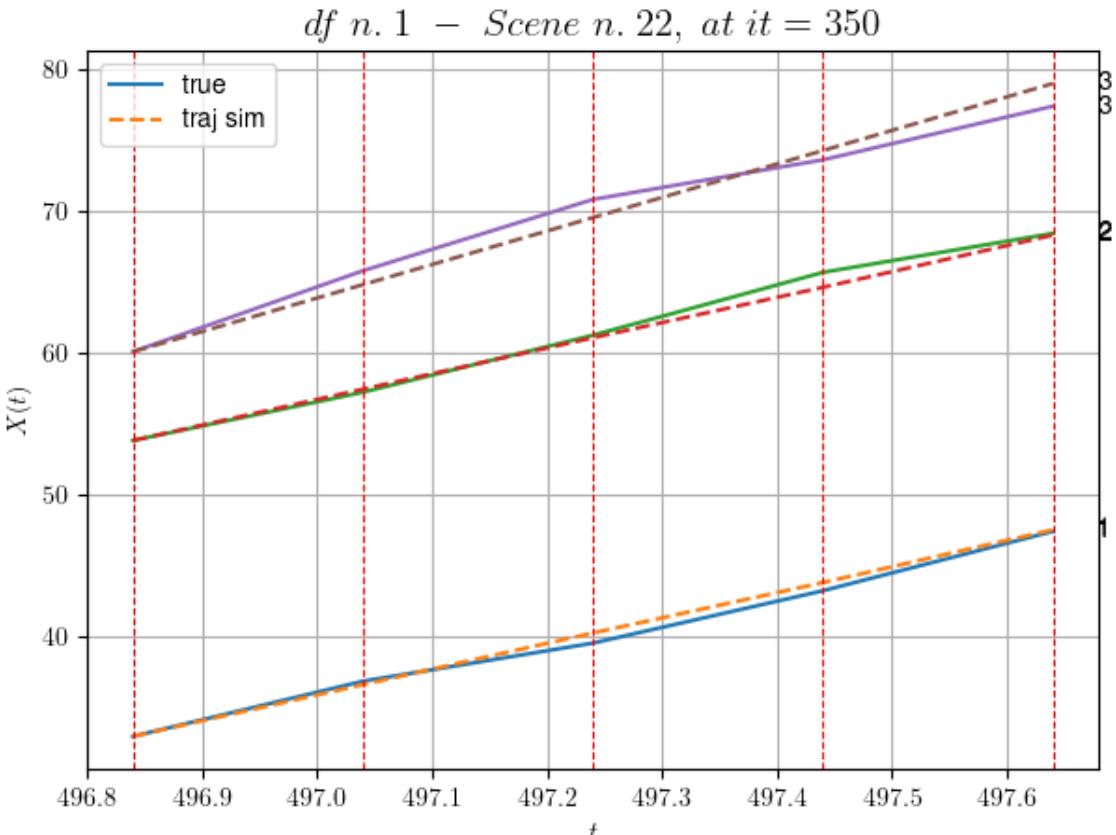
-----
- Time interval n.3: [497.44, 497.64]
* y_true: [20.96085077 13.7761341 ]
* v_ann: [18.648998260498047, 18.429981231689453, 2
3.671067862249377]

```

```

* err= 0.5152305691823305
* Learning rate NN = 0.000239148415857926
* diff = 4.296233234379887e-05

```



For scene 22/28

```

* use LR_NN=0.0005 with err=14.136356481232431 at it=19
* v0_scn_mean = 24.213501874388925
* MAE = 0.5143025452753686

```

```

=====
=====
- Time interval n.0: [499.04, 499.24]
* y_true: [23.84103851 15.32650765]
* v_ann: [21.558202743530273, 21.62358283996582, 1
7.832251439874415]

```

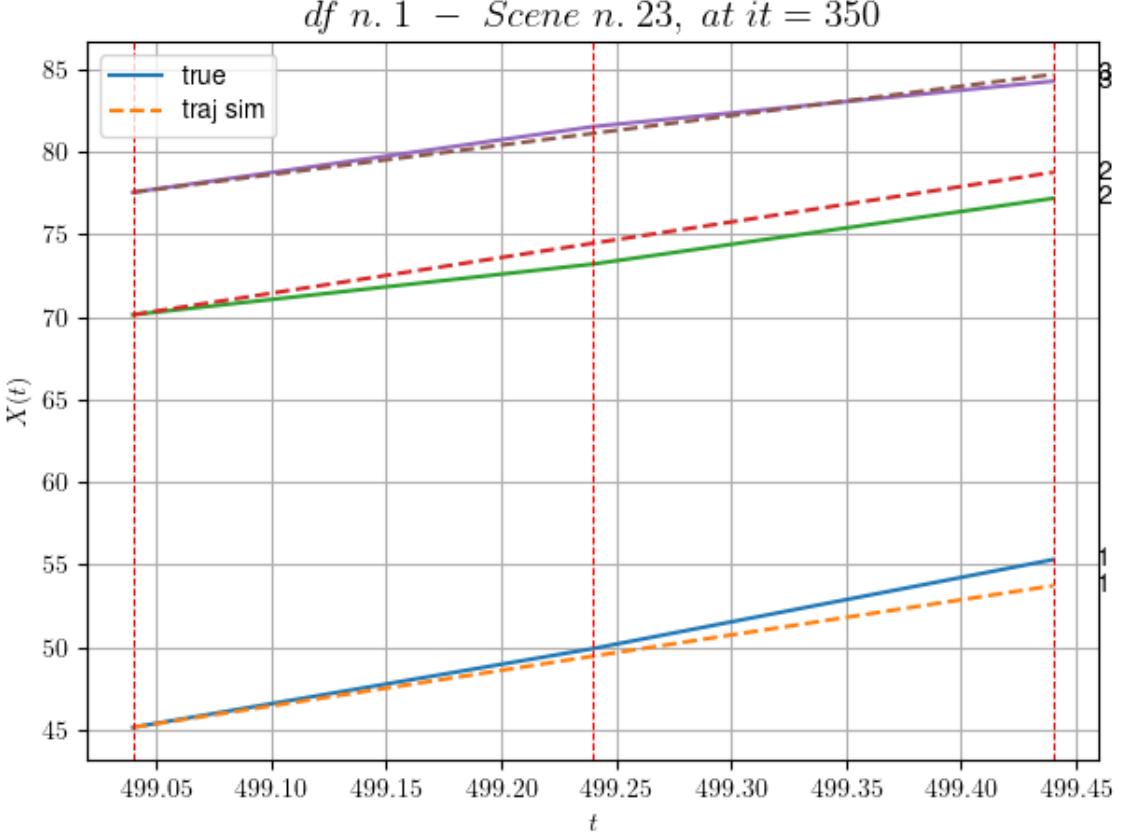
```

=====
- Time interval n.1: [499.24, 499.44]

```

```
* y_true: [26.92142921 19.88726092]
* v_ann: [21.32090187072754, 21.453950881958008, 1
7.832251439874415]
```

```
-----  
-----  
* err= 0.7874471147770717  
* Learning rate NN = 7.289998757187277e-05  
* diff = 0 00019156875282355657
```



For scene 23/28

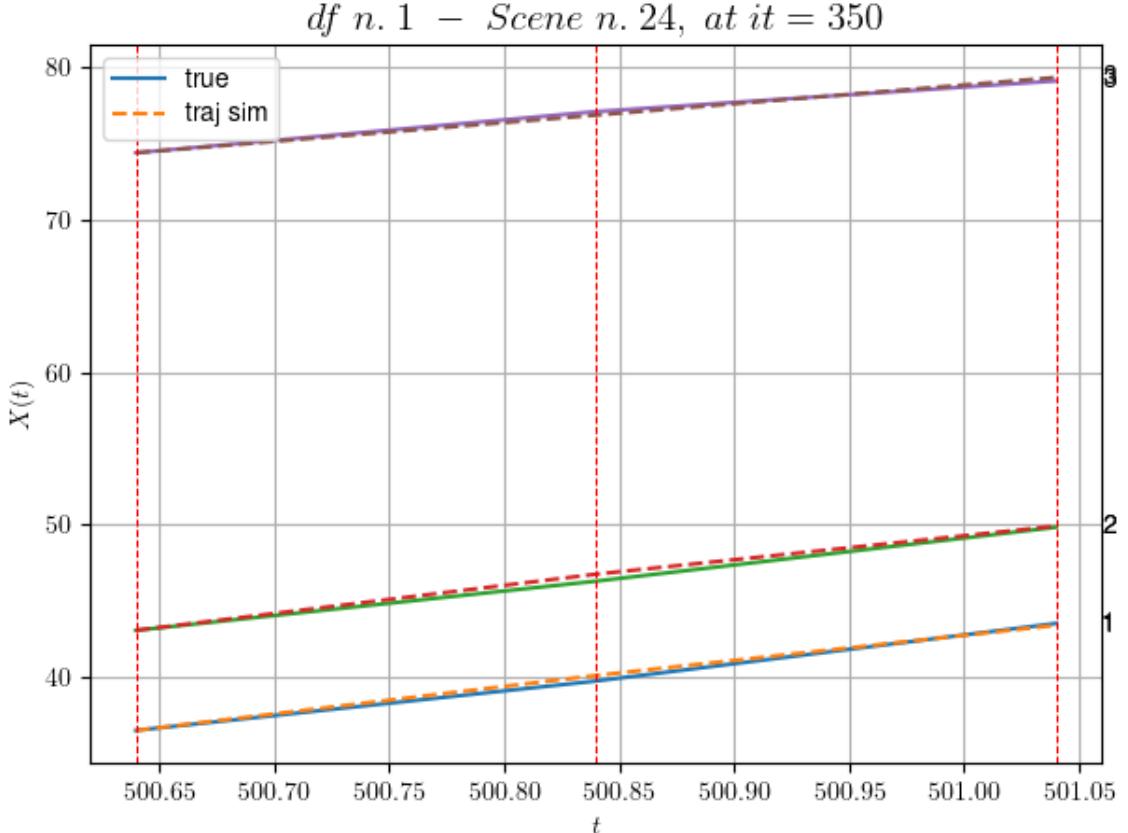
```
* use LR_NN=0.0001 with err=5.226036650921323 at it=19
* v0_scn_mean = 18.875113099080586
* MAE = 0.7445919525058157
```

```
=====  
=====  
- Time interval n.0: [500.64, 500.84]
* y_true: [16.2004483 16.13562888]
* v_ann: [18.028602600097656, 18.430253982543945, 1
2.361497672471485]
```

```
=====  
=====  
- Time interval n.1: [500.84, 501.04]
* y_true: [18.900675 17.67575332]
* v_ann: [16.453603744506836, 15.77331256866455, 1
2.361497672471485]
```

```
=====  
=====  
* err= 0.052502569088972974
* Learning rate NN = 0.0007289999630302191
```

\* diff = 8.285474404831628e-07



For scene 24/28

\* use LR\_NN=0.001 with err=11.109189783474399 at it=19  
 \* v0\_scn\_mean = 13.873241419665247  
 \* MAE = 0.052118559082327466

---



---

- Time interval n.0: [502.24, 502.44]  
 \* y\_true: [20.97545504 14.04040867]  
 \* v\_ann: [17.8609561920166, 18.200199127197266, 15.  
 581120912086929]

---

- Time interval n.1: [502.44, 502.64]  
 \* y\_true: [18.07559412 14.7904947 ]  
 \* v\_ann: [17.609371185302734, 17.75984764099121, 1  
 5.581120912086929]

---

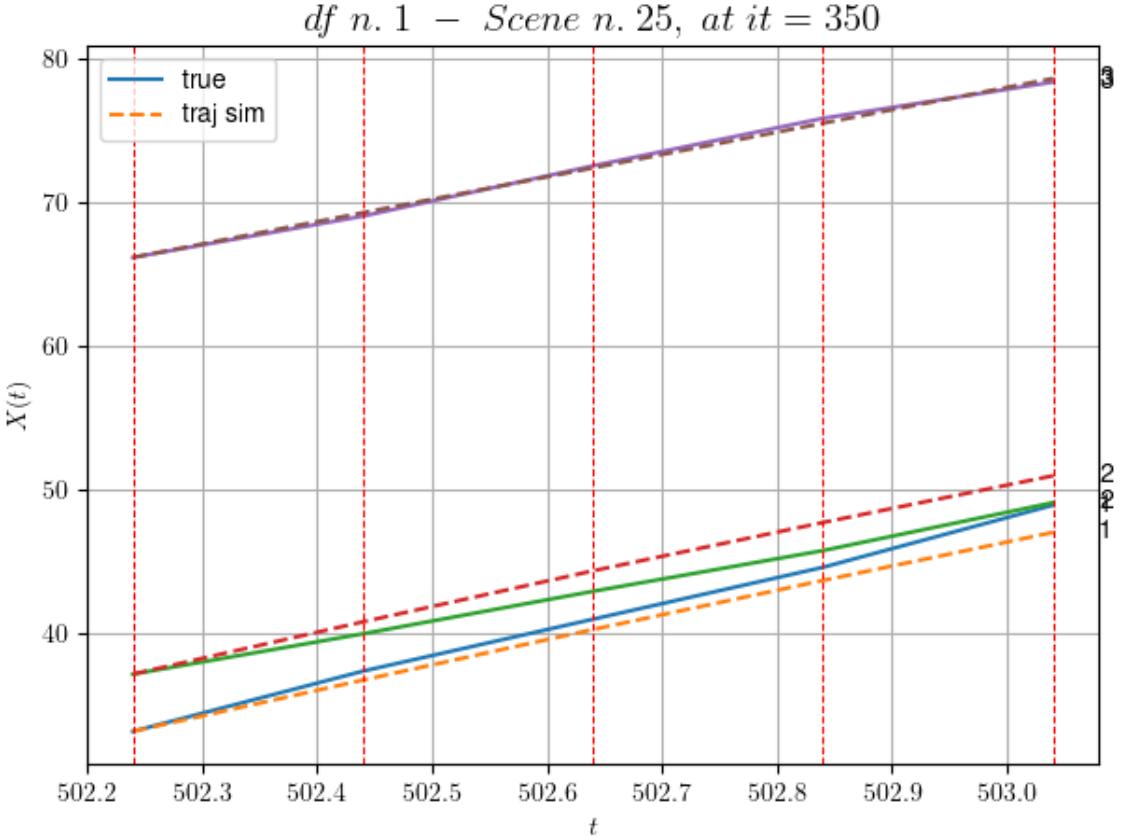
- Time interval n.2: [502.64, 502.84]  
 \* y\_true: [18.07559412 14.18054394]  
 \* v\_ann: [17.074241638183594, 16.829919815063477, 1  
 5.581120912086929]

---

- Time interval n.3: [502.84, 503.04]  
 \* y\_true: [21.64181695 16.68485314]

```
* v_ann: [16.745513916015625, 16.280057907104492, 1
5.581120912086929]
```

```
-----  
* err= 1.0440000682631478  
* Learning rate NN = 0.000478296831715852  
* diff = 3.252314103363574e-06
```



For scene 25/28

```
* use LR_NN=0.001 with err=40.7935525927145 at it=19
* v0_scn_mean = 16.816920295613482
* MAE = 1.0419415295352368
```

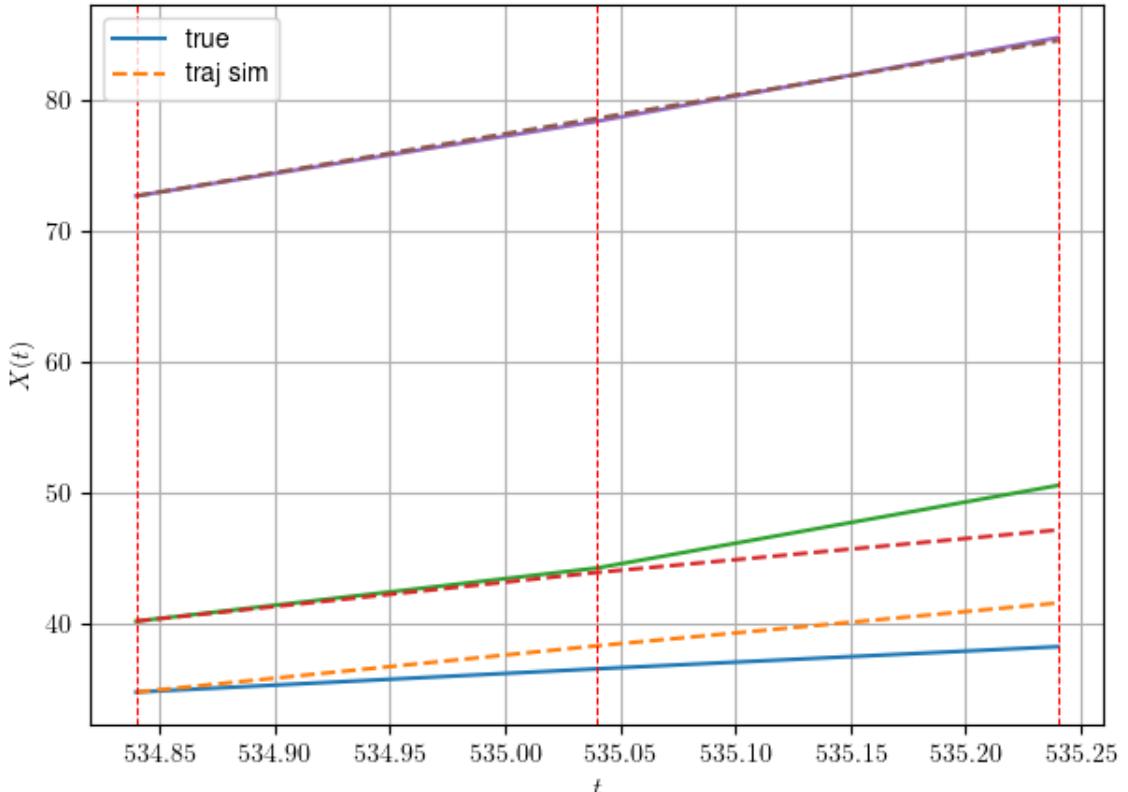
```
=====
=====
- Time interval n.0: [534.84, 535.04]
* y_true: [ 8.93323515 20.37071651]
* v_ann: [17.744651794433594, 18.68567657470703, 2
9.753484139129853]
```

```
=====
=====
- Time interval n.1: [535.04, 535.24]
* y_true: [ 8.47527286 31.64140498]
* v_ann: [16.390233993530273, 16.258485794067383, 2
9.753484139129853]
```

```
=====
=====
* err= 2.907617096171892
* Learning rate NN = 0.00036449998151510954
```

\* diff = 1.0082061141947207e-05

df n. 1 — Scene n. 26, at it = 350



For scene 26/28

\* use LR\_NN=0.0005 with err=1.0628697262385562 at it=19  
 \* v0\_scn\_mean = 29.774612282797555  
 \* MAE = 2.8962872077088644

---



---

- Time interval n.0: [573.84, 574.04]  
 \* y\_true: [20.07571717 13.74586409]  
 \* v\_ann: [13.25574016571045, 13.436470985412598, 9.  
 338868955850456]

---

- Time interval n.1: [574.04, 574.24]  
 \* y\_true: [13.45064024 11.92582032]  
 \* v\_ann: [14.36572265625, 14.73500919342041, 9.3388  
 68955850456]

---

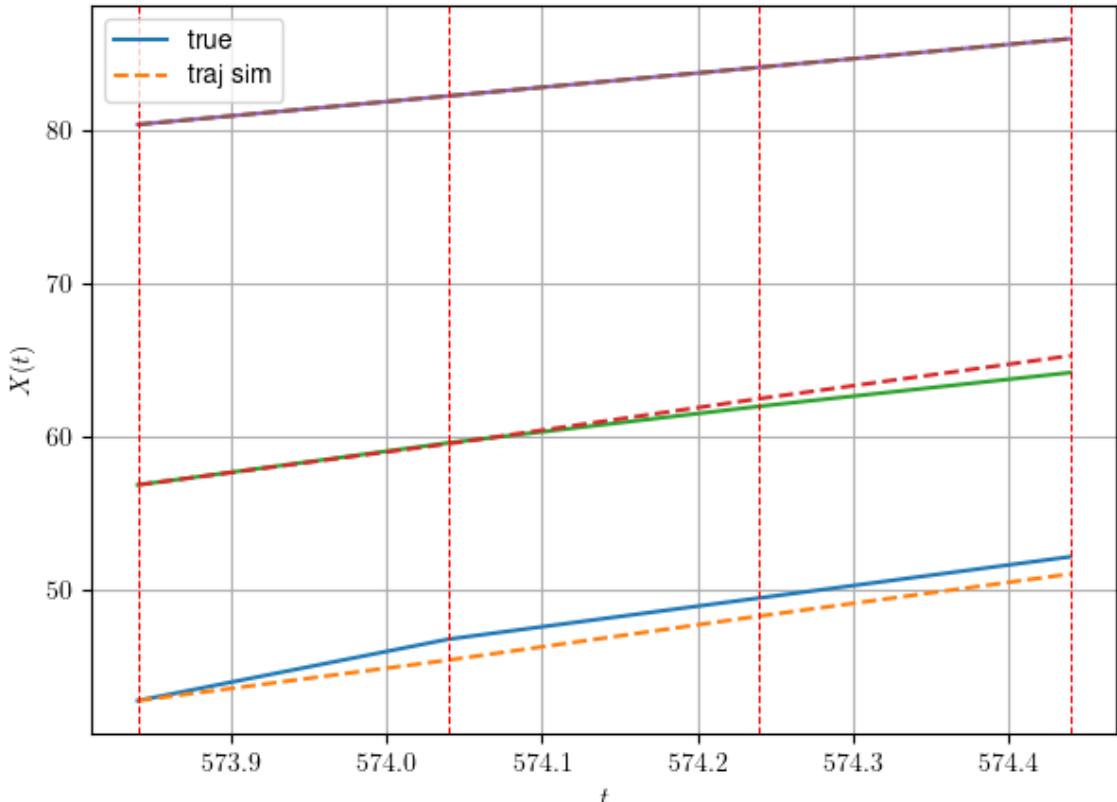
- Time interval n.2: [574.24, 574.44]  
 \* y\_true: [13.45064024 11.00083908]  
 \* v\_ann: [13.746430397033691, 14.008755683898926,  
 9.338868955850456]

---

\* err= 0.49840505877369184  
 \* Learning rate NN = 0.0002952449722215533

\* diff = 0.0006383279808324094

df n. 1 - Scene n. 27, at it = 350



For scene 27/28

\* use LR\_NN=0.0005 with err=22.67499845094248 at it=19  
 \* v0\_scn\_mean = 11.10967325011275  
 \* MAE = 0.4830748423410582

For df=1 with 28 scenes, time taken: 272.97

In df n. 2/10 we have 18 scenes

For scene 0/18  
 \* use LR\_NN=5e-05 with err=15.818232818772927 at it=19  
 \* v0\_scn\_mean = 17.61174379946328  
 \* MAE = 0.20718348501205097

- Time interval n.0: [109.36, 109.56]  
 \* y\_true: [28.77160952 15.03115545]  
 \* v\_ann: [22.31959342956543, 22.881675720214844, 2  
 0.033930717995364]

```

-----  

-----  

- Time interval n.1: [109.56, 109.76]  

  * y_true: [23.64157457 15.83133823]  

  * v_ann: [22.354896545410156, 22.729557037353516, 2  

0.033930717995364]

```

```

-----  

-----  

- Time interval n.2: [109.76, 109.96]  

  * y_true: [24.63196009 20.68195399]  

  * v_ann: [21.87514877319336, 22.059568405151367, 2  

0.033930717995364]

```

```

-----  

-----  

- Time interval n.3: [109.96, 110.16]  

  * y_true: [26.38241903 23.49250056]  

  * v_ann: [22.076797485351562, 22.15729522705078, 2  

0.033930717995364]

```

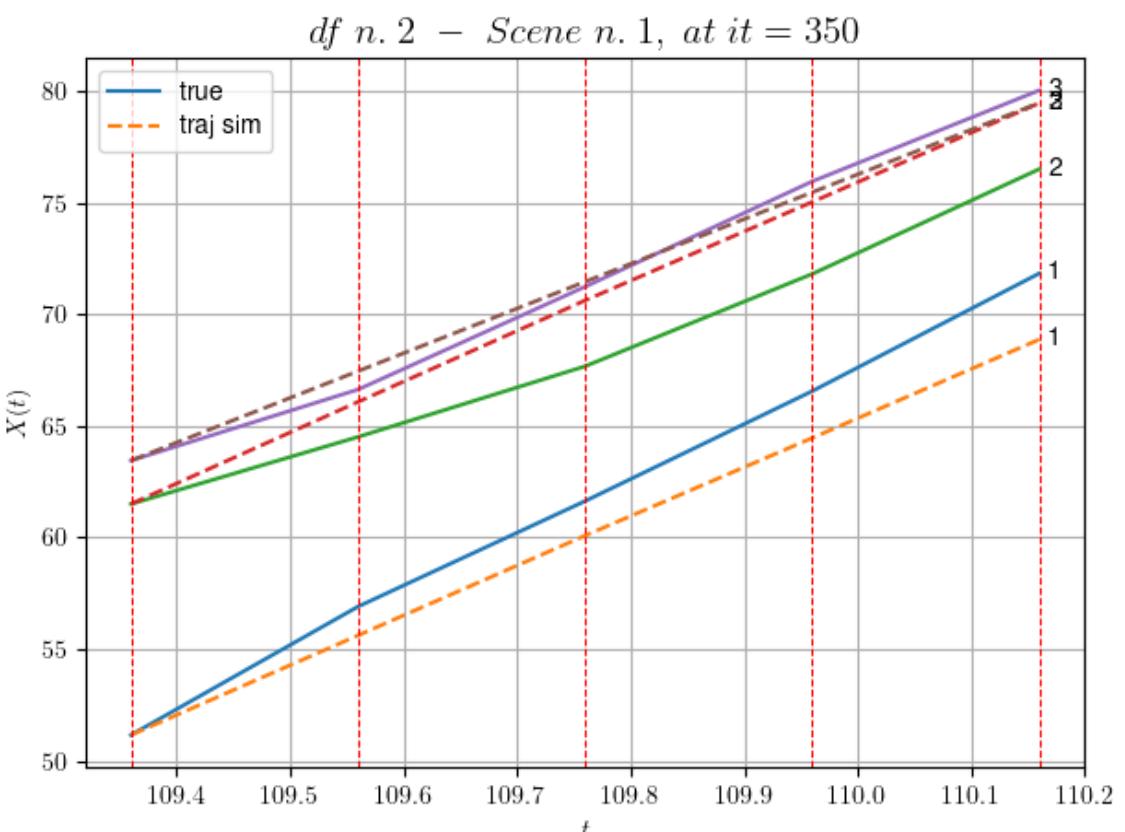
```

* err= 3.2555548804577885  

* Learning rate NN = 0.000239148415857926  

* diff = 0.002328724678231975

```



For scene 1/18

```

* use LR_NN=0.0005 with err=11.529771033980808 at it=19
* v0_scn_mean = 20.88809297289708
* MAE = 3.2555548804577885

```

```

- Time interval n.0: [170.36, 170.56]
  * y_true: [25.3307413 19.52081588]
  * v_ann: [25.55002784729004, 25.647918701171875, 1
6.151709457623525]

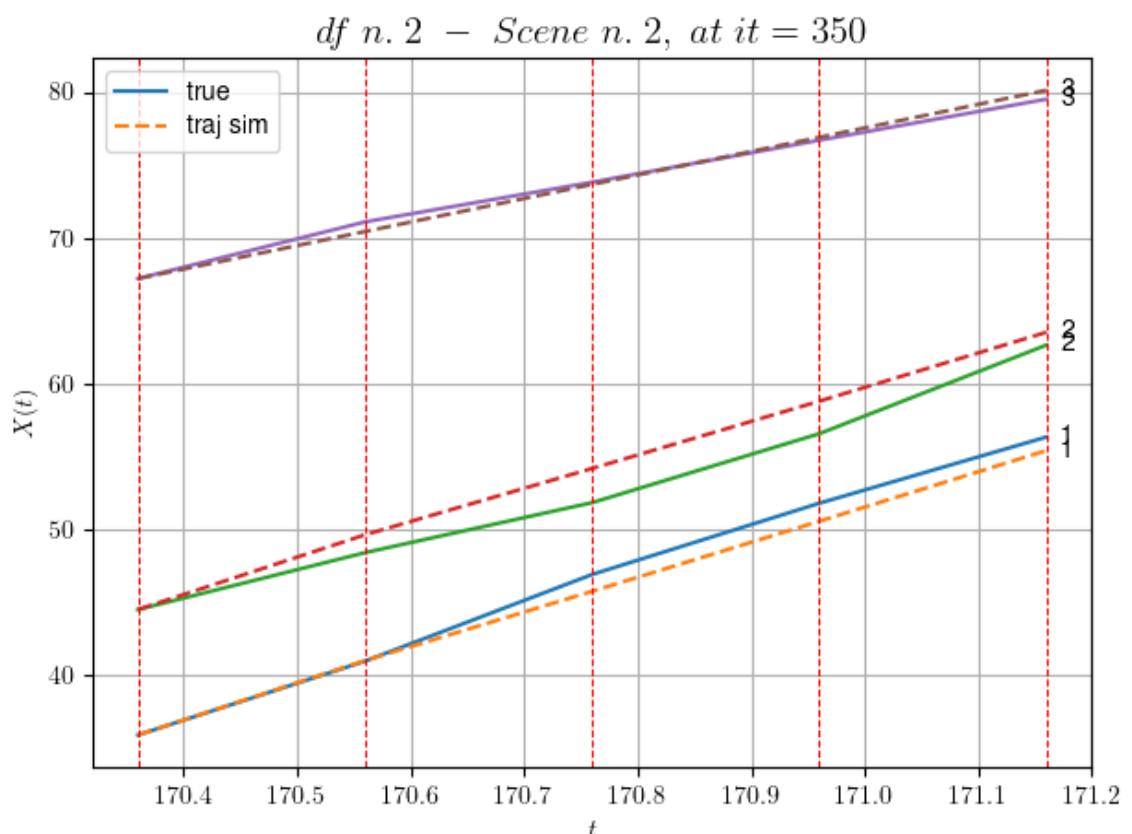
-----
- Time interval n.1: [170.56, 170.76]
  * y_true: [29.74113537 17.1608437 ]
  * v_ann: [23.74110221862793, 22.753894805908203, 1
6.151709457623525]

-----
- Time interval n.2: [170.76, 170.96]
  * y_true: [24.43113316 23.6413756 ]
  * v_ann: [24.02245330810547, 23.073301315307617, 1
6.151709457623525]

-----
- Time interval n.3: [170.96, 171.16]
  * y_true: [22.71130298 30.41206279]
  * v_ann: [24.283300399780273, 23.645978927612305, 1
6.151709457623525]

* err= 1.155836856190479
* Learning rate NN = 0.000478296831715852
* diff = 4.718944728532293e-06

```



For scene 2/18

```
* use LR_NN=0.001 with err=39.78077030454121 at it=19
```

```
* v0_scn_mean = 17.338605388356104
```

```
* MAE = 1.1533719497719768
```

```
=====
=====
```

---

```
- Time interval n.0: [179.36, 179.56]
 * y_true: [10.36002857 23.43048282]
 * v_ann: [17.628662109375, 17.402786254882812, 22.0
8205674402126]
```

---

```
- Time interval n.1: [179.56, 179.76]
 * y_true: [10.37004005 22.87060641]
 * v_ann: [17.52906036376953, 17.365015029907227, 2
2.08205674402126]
```

---

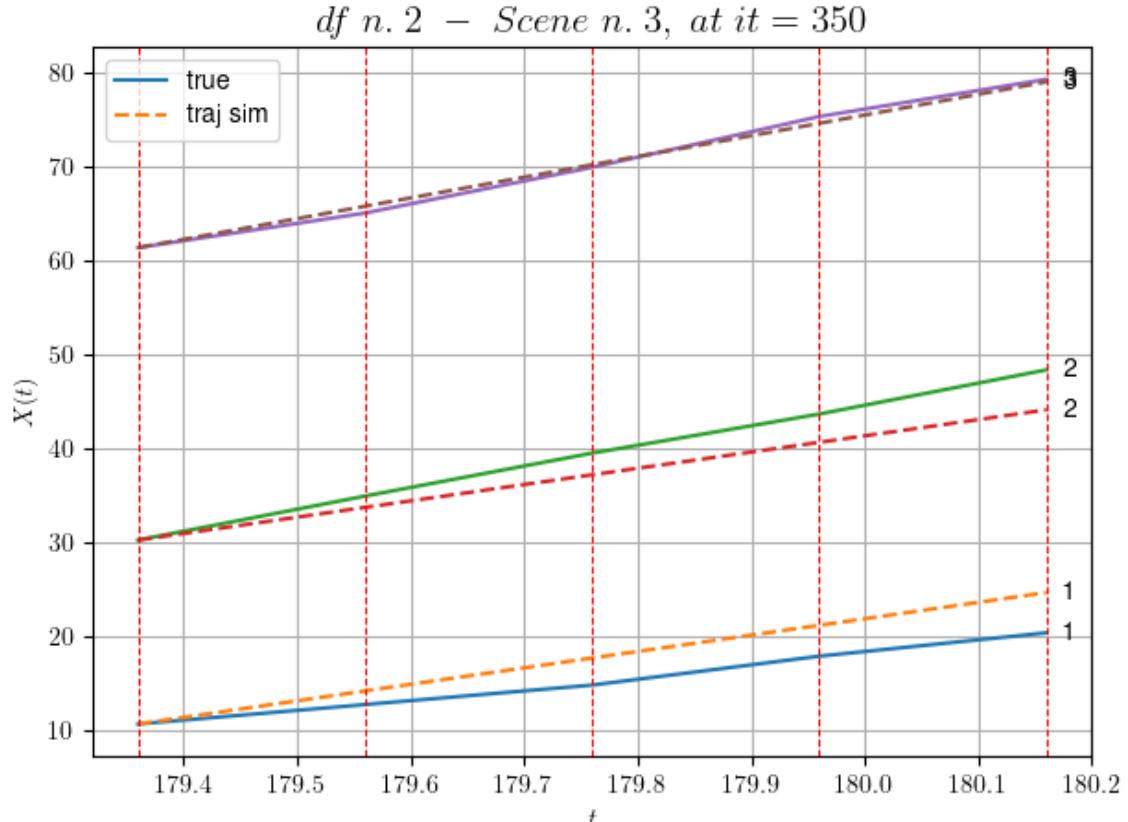
```
- Time interval n.2: [179.76, 179.96]
 * y_true: [15.39008451 20.81068862]
 * v_ann: [17.40715980529785, 17.279726028442383, 2
2.08205674402126]
```

---

```
- Time interval n.3: [179.96, 180.16]
 * y_true: [12.44008929 23.53096892]
 * v_ann: [17.451683044433594, 17.329668045043945, 2
2.08205674402126]
```

---

```
* err= 4.987385890243888
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.00002365132612257
```



For scene 3/18

```
* use LR_NN=0.0001 with err=5.9296393139208865 at it=19
* v0_scn_mean = 22.760680188664768
* MAE = 4.987385890243888
```

---



---

For scene 4/18

```
* use LR_NN=0.001 with err=10.30241999059408 at it=19
* v0_scn_mean = 16.136951087360984
* MAE = 0.013380452034866411
```

---



---

```
- Time interval n.0: [212.56, 212.76]
  * y_true: [14.43013055 12.85042103]
  * v_ann: [16.844989776611328, 16.632600784301758, 2
0.50720391476299]
```

---

```
- Time interval n.1: [212.76, 212.96]
  * y_true: [10.79011916 33.80137312]
  * v_ann: [16.745601654052734, 16.43081283569336, 2
0.50720391476299]
```

---

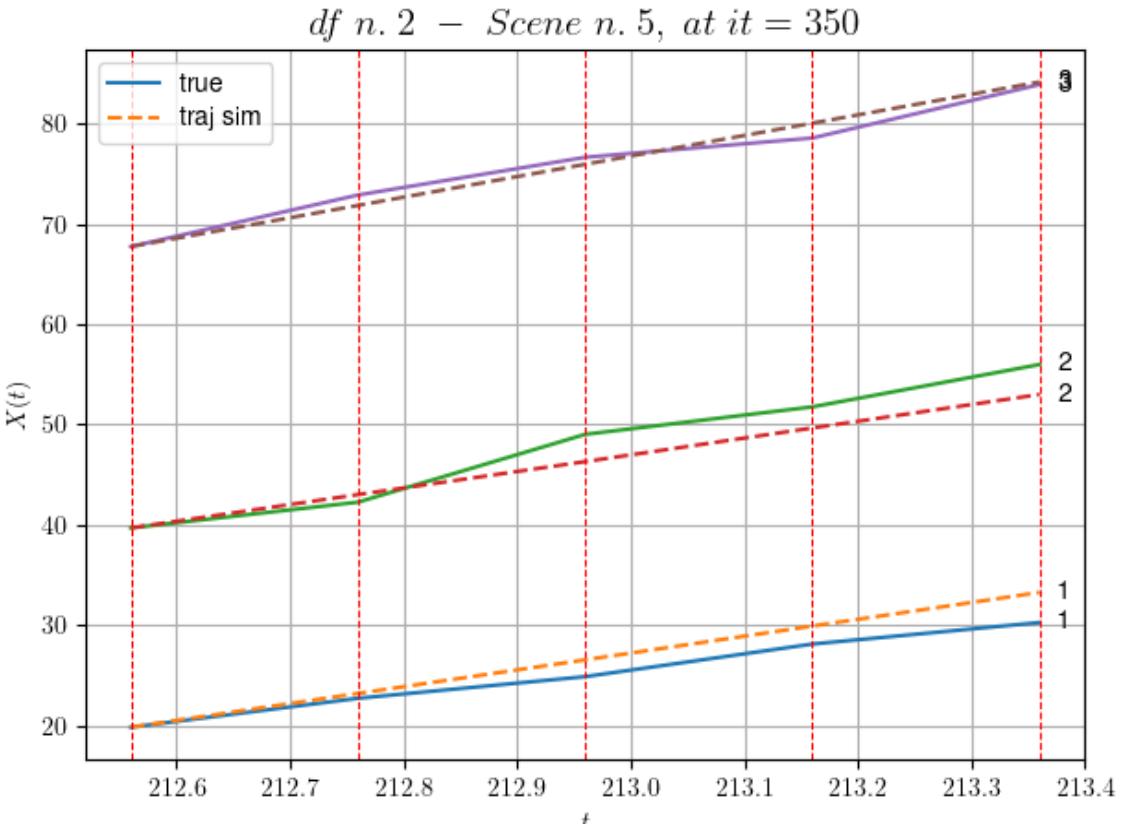
```
- Time interval n.2: [212.96, 213.16]
```

```

* y_true: [16.24022861 13.70067627]
* v_ann: [16.840089797973633, 16.758323669433594, 2
0.50720391476299]

-----
- Time interval n.3: [213.16, 213.36]
* y_true: [10.73017559 21.10118973]
* v_ann: [16.779098510742188, 16.699607849121094, 2
0.50720391476299]

-----
* err= 2.6947561213425018
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.0000000000000000
```



For scene 5/18

```

* use LR_NN=5e-05 with err=8.76674493796508 at it=19
* v0_scn_mean = 21.32080332693334
* MAE = 2.6947561213425018
```

```

=====
=====

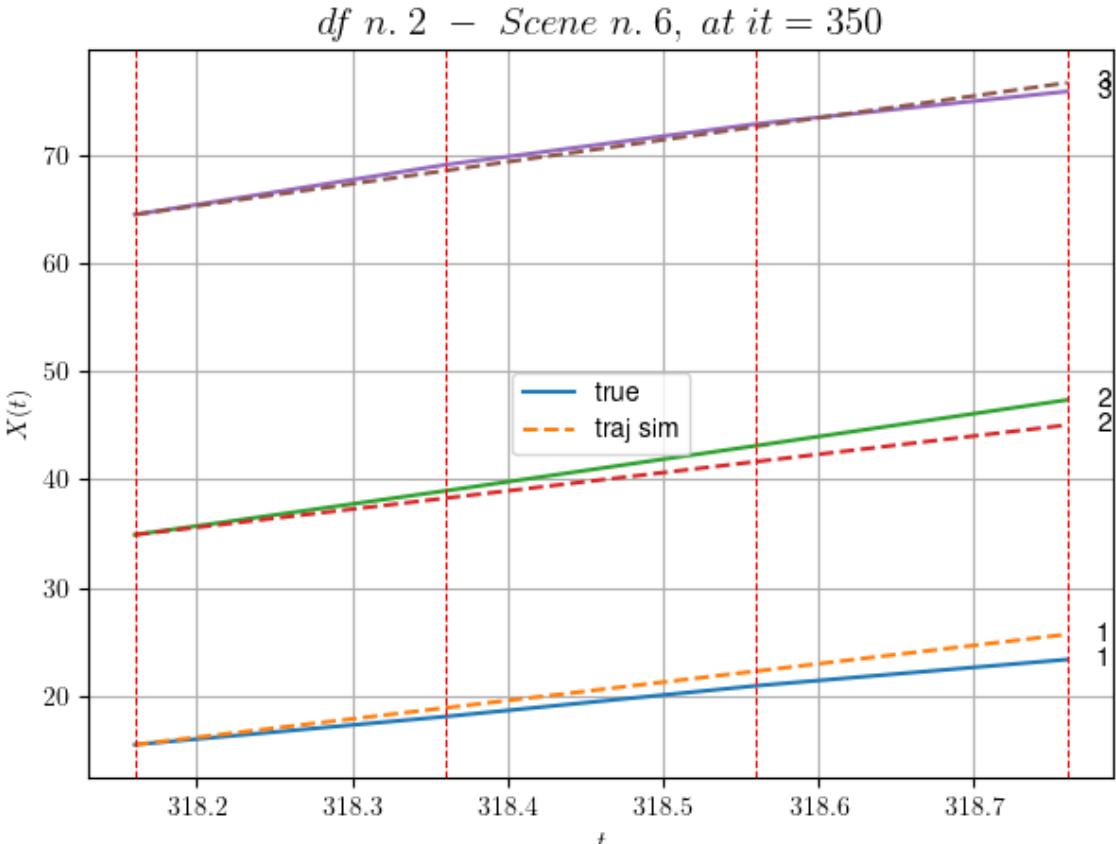
- Time interval n.0: [318.16, 318.36]
* y_true: [13.01007537 20.36054455]
* v_ann: [17.045108795166016, 16.944992065429688, 2
0.355267320886764]

-----
- Time interval n.1: [318.36, 318.56]
* y_true: [14.27010639 20.89068863]
```

```
* v_ann: [17.016799926757812, 16.922895431518555, 2
0.355267320886764]
```

```
- Time interval n.2: [318.56, 318.76]
* y_true: [12.16011799 21.20084683]
* v_ann: [17.032852172851562, 16.961347579956055, 2
0.355267320886764]
```

```
* err= 1.4154710225624312
* Learning rate NN = 2.952449540316593e-05
* diff = 0.000461896050496291
```



For scene 6/18

```
* use LR_NN=5e-05 with err=4.955759177038417 at it=19
* v0_scn_mean = 21.181888768119535
* MAE = 1.4154710225624312
```

```
- Time interval n.0: [430.16, 430.36]
* y_true: [15.83005748 20.27065425]
* v_ann: [18.9021053314209, 18.866209030151367, 21.
23696606139114]
```

```
- Time interval n.1: [430.36, 430.56]
* y_true: [19.99011659 24.33092793]
```

```
* v_ann: [18.902889251708984, 18.890472412109375, 2
1.23696606139114]
```

---

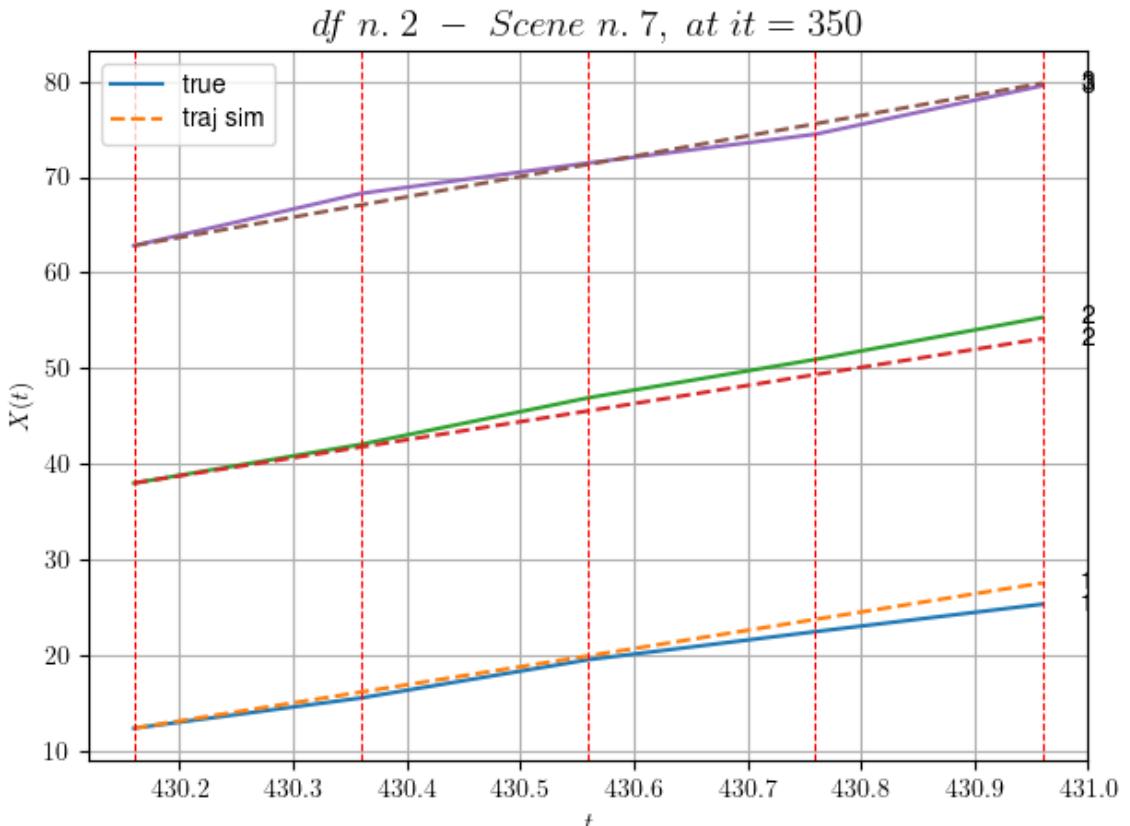
```
- Time interval n.2: [430.56, 430.76]
* y_true: [14.67011767 20.05093433]
* v_ann: [19.100786209106445, 18.96662712097168, 2
1.23696606139114]
```

---

```
- Time interval n.3: [430.76, 430.96]
* y_true: [14.38015429 21.97121967]
* v_ann: [19.06830406188965, 18.84372901916504, 21.
23696606139114]
```

---

```
* err= 1.2824055065593563
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.0001520894951809737
```



For scene 7/18

```
* use LR_NN=5e-05 with err=8.6279906375642 at it=19
* v0_scn_mean = 21.98801972326932
* MAE = 1.281090909898044
```

---



---

```
- Time interval n.0: [435.96, 436.16]
* y_true: [15.85107698 23.95169404]
* v_ann: [19.90125274658203, 21.911714553833008, 2
```

1.458777210396597]

---

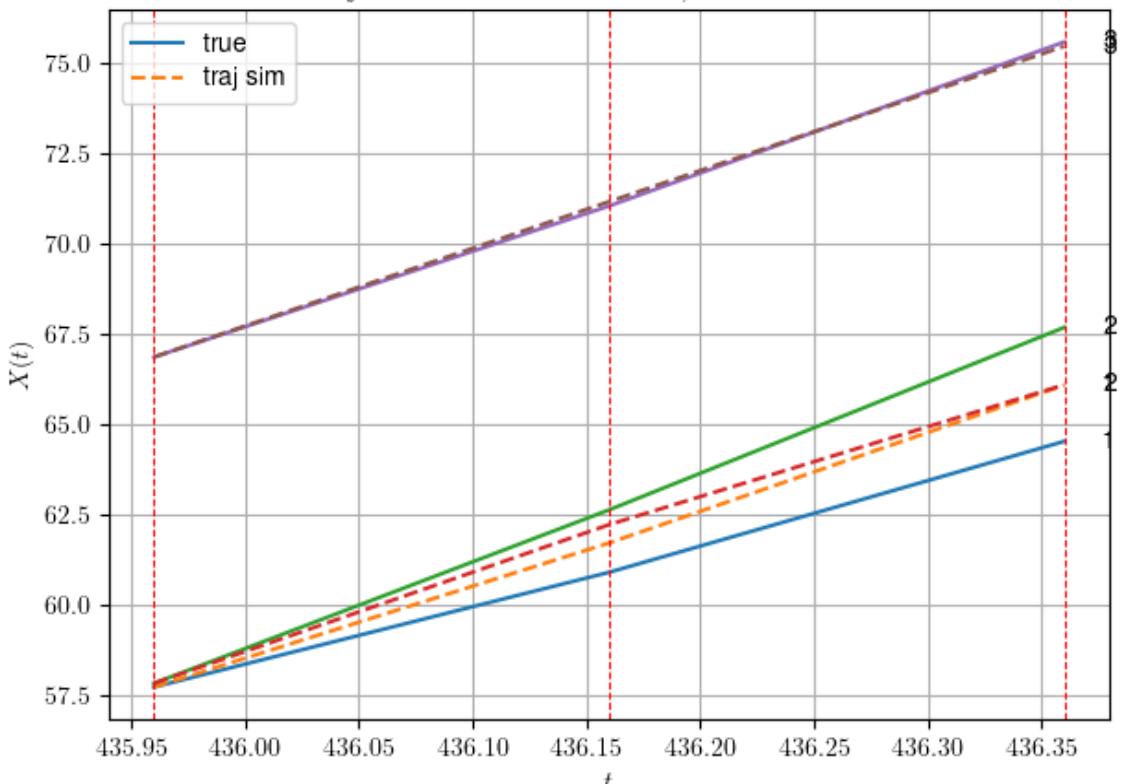
- Time interval n.1: [436.16, 436.36]
  - \* y\_true: [18.0813972 25.19206379]
  - \* v\_ann: [21.79795265197754, 19.309202194213867, 2

1.458777210396597]

---

- \* err= 0.6416500335916303
- \* Learning rate NN = 0.0036449995823204517
- \* diff = 1.992646583781621e-05

*df n. 2 – Scene n. 8, at it = 350*



For scene 8/18

- \* use LR\_NN=0.005 with err=3.856453283611493 at it=19
- \* v0\_scn\_mean = 22.190820096226993
- \* MAE = 0.639392044447821

---



---

- Time interval n.0: [442.76, 442.96]
  - \* y\_true: [18.06141662 13.31057742]
  - \* v\_ann: [19.343490600585938, 18.954648971557617, 2

2.775949002662287]

---

- Time interval n.1: [442.96, 443.16]
  - \* y\_true: [20.34015276 11.01053508]
  - \* v\_ann: [18.95160484313965, 18.80369758605957, 22.

775949002662287]

```
- Time interval n.2: [443.16, 443.36]
  * y_true: [26.42894929 13.47072378]
  * v_ann: [18.61204719543457, 18.63627052307129, 22.
```

775949002662287]

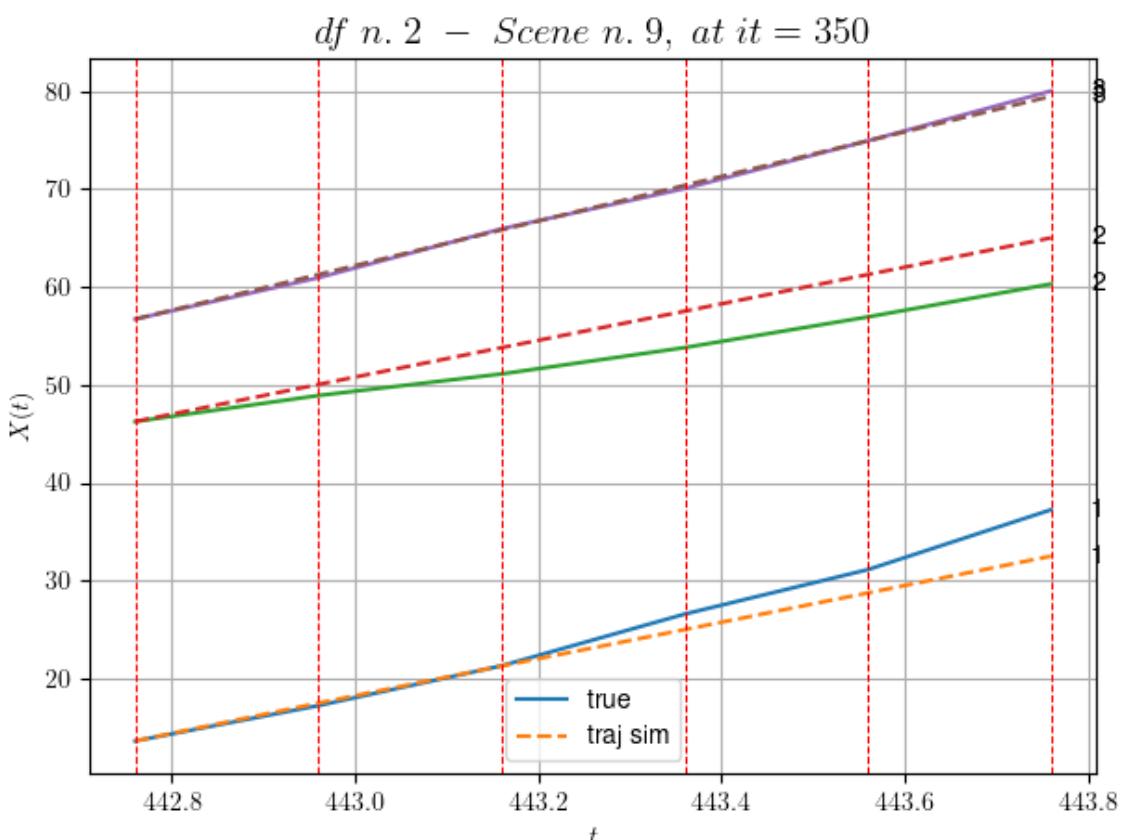
```
- Time interval n.3: [443.36, 443.56]
  * y_true: [22.70036274 15.67093348]
  * v_ann: [18.741926193237305, 18.71773338317871, 2
```

2.775949002662287]

```
- Time interval n.4: [443.56, 443.76]
  * y_true: [30.60068675 16.84112333]
  * v_ann: [18.77910804748535, 18.75190544128418, 22.
```

775949002662287]

```
* err= 5.250175128119737
* Learning rate NN = 3.874203684972599e-05
* diff = 0.001144522238663015
```



For scene 9/18

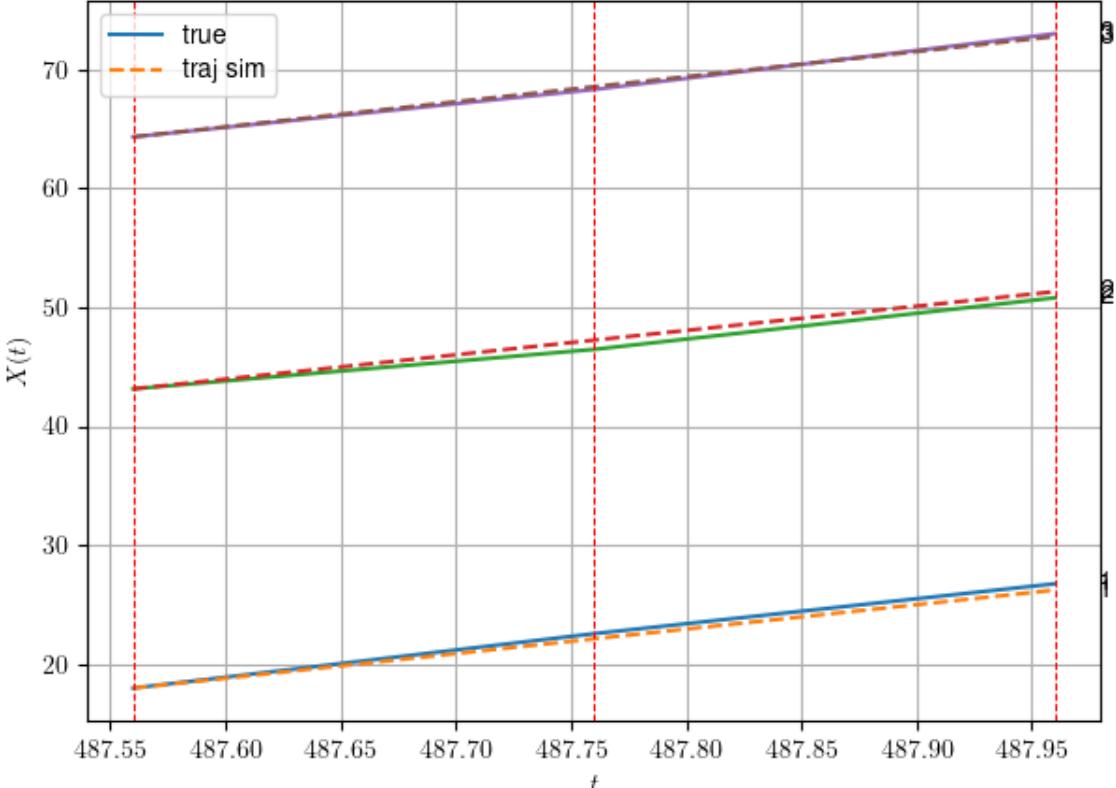
```
* use LR_NN=0.0001 with err=8.130015761940177 at it=19
* v0_scn_mean = 23.39510099878082
* MAE = 5.250175128119737
```

```
=====
=====
- Time interval n.0: [487.56, 487.76]
  * y_true: [22.90018755 16.61065196]
  * v_ann: [20.747037887573242, 20.51173210144043, 2
1.111964471909]
```

```
=====
- Time interval n.1: [487.76, 487.96]
  * y_true: [21.00025249 21.71102285]
  * v_ann: [20.515413284301758, 20.40465545654297, 2
1.111964471909]
```

```
=====
* err= 0.16211113119742482
* Learning rate NN = 7.289998757187277e-05
* dfff = 4 7302117000000012 0E
```

*df n. 2 – Scene n. 10, at it = 350*



For scene 10/18

```
* use LR_NN=0.0001 with err=1.6990253816163774 at it=19
* v0_scn_mean = 21.87373164946894
* MAE = 0.1595929568298912
```

```
=====
=====
- Time interval n.0: [531.76, 531.96]
  * y_true: [23.26110286 19.80102444]
  * v_ann: [21.176286697387695, 21.887279510498047, 1
7.911818675880156]
```

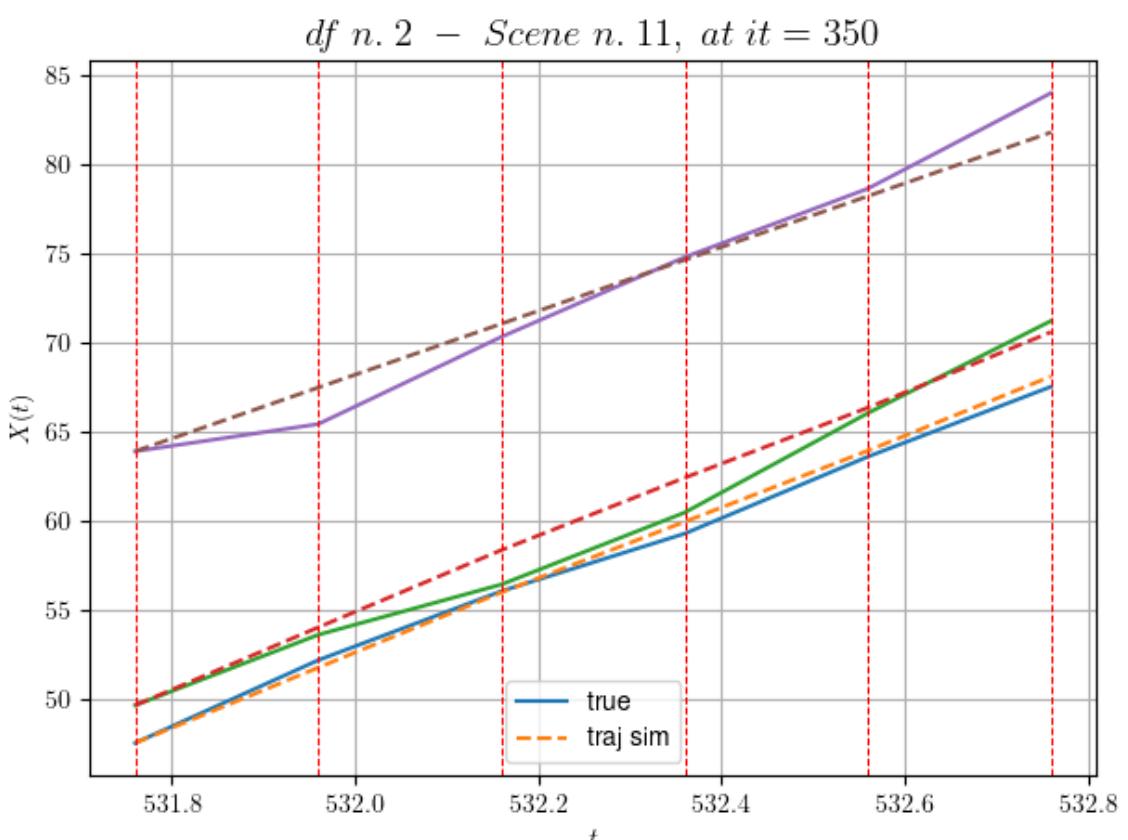
```
- Time interval n.1: [531.96, 532.16]
  * y_true: [19.37730225 14.13461647]
  * v_ann: [21.129566192626953, 21.70137596130371, 1
7.911818675880156]

- Time interval n.2: [532.16, 532.36]
  * y_true: [16.15104075 20.18132342]
  * v_ann: [19.810941696166992, 20.299602508544922, 1
7.911818675880156]

- Time interval n.3: [532.36, 532.56]
  * y_true: [21.60157988 27.91216632]
  * v_ann: [19.952117919921875, 19.664390563964844, 1
7.911818675880156]

- Time interval n.4: [532.56, 532.76]
  * y_true: [19.65163525 25.90233391]
  * v_ann: [20.865150451660156, 21.256303787231445, 1
7.911818675880156]

* err= 1.0616256096049077
* Learning rate NN = 0.0003874204121530056
* diff = 1.6657969563071973e-05
```



For scene 11/18

\* use LR\_NN=0.001 with err=35.76926218041219 at it=19  
\* v0\_scn\_mean = 18.947860863156084  
\* MAE = 1.0339003309955268

=====

=====

- Time interval n.0: [538.36, 538.56]  
\* y\_true: [17.69068154 17.20117669]  
\* v\_ann: [21.754079818725586, 20.744016647338867, 2  
1.51893062775074]

-----

- Time interval n.1: [538.56, 538.76]  
\* y\_true: [18.89091077 18.60142936]  
\* v\_ann: [20.01490020751953, 19.789710998535156, 2  
1.51893062775074]

-----

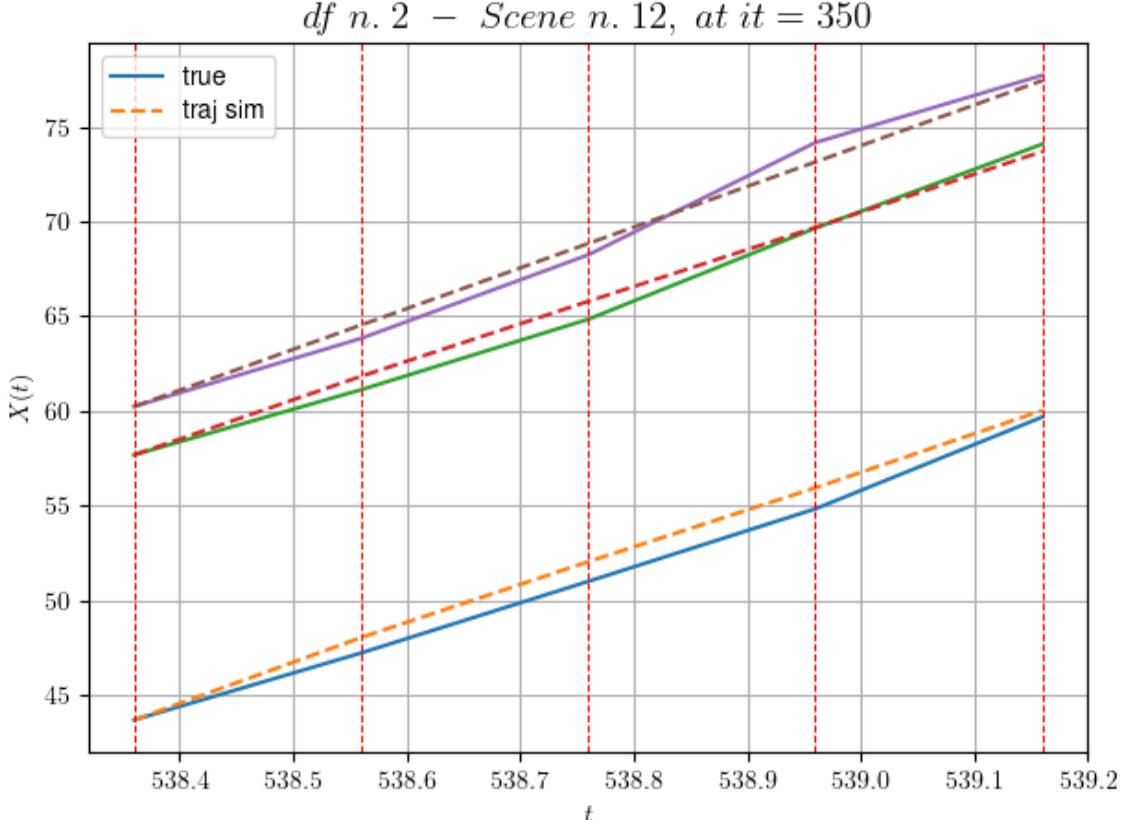
- Time interval n.2: [538.76, 538.96]  
\* y\_true: [19.15102468 24.05210496]  
\* v\_ann: [19.525367736816406, 19.50920295715332, 2  
1.51893062775074]

-----

- Time interval n.3: [538.96, 539.16]  
\* y\_true: [24.26158149 22.202218 ]  
\* v\_ann: [20.42144012451172, 20.070960998535156, 2  
1.51893062775074]

-----

\* err= 0.44166815785971963  
\* Learning rate NN = 0.000478296831715852  
\* diff = 5.858460067287297e-06



For scene 12/18

\* use LR\_NN=0.001 with err=19.890680985165563 at it=19

\* v0\_scn\_mean = 22.24581794249738

\* MAE = 0.4414551525501443

---



---

- Time interval n.0: [541.16, 541.36]  
 \* y\_true: [22.67086863 28.23390149]  
 \* v\_ann: [23.272424697875977, 22.99195671081543, 2  
 0.490059693196006]

---

- Time interval n.1: [541.36, 541.56]  
 \* y\_true: [19.45088023 23.11862329]  
 \* v\_ann: [23.672731399536133, 23.844709396362305, 2  
 0.490059693196006]

---

- Time interval n.2: [541.56, 541.76]  
 \* y\_true: [24.96136667 24.68114114]  
 \* v\_ann: [23.20278549194336, 23.003768920898438, 2  
 0.490059693196006]

---

- Time interval n.3: [541.76, 541.96]  
 \* y\_true: [23.96154506 23.41644837]  
 \* v\_ann: [23.528072357177734, 23.549314498901367, 2

0.490059693196006]

---

- Time interval n.4: [541.96, 542.16]
  - \* y\_true: [22.22167267 29.9460798 ]
  - \* v\_ann: [23.555343627929688, 23.593101501464844, 2

0.490059693196006]

---



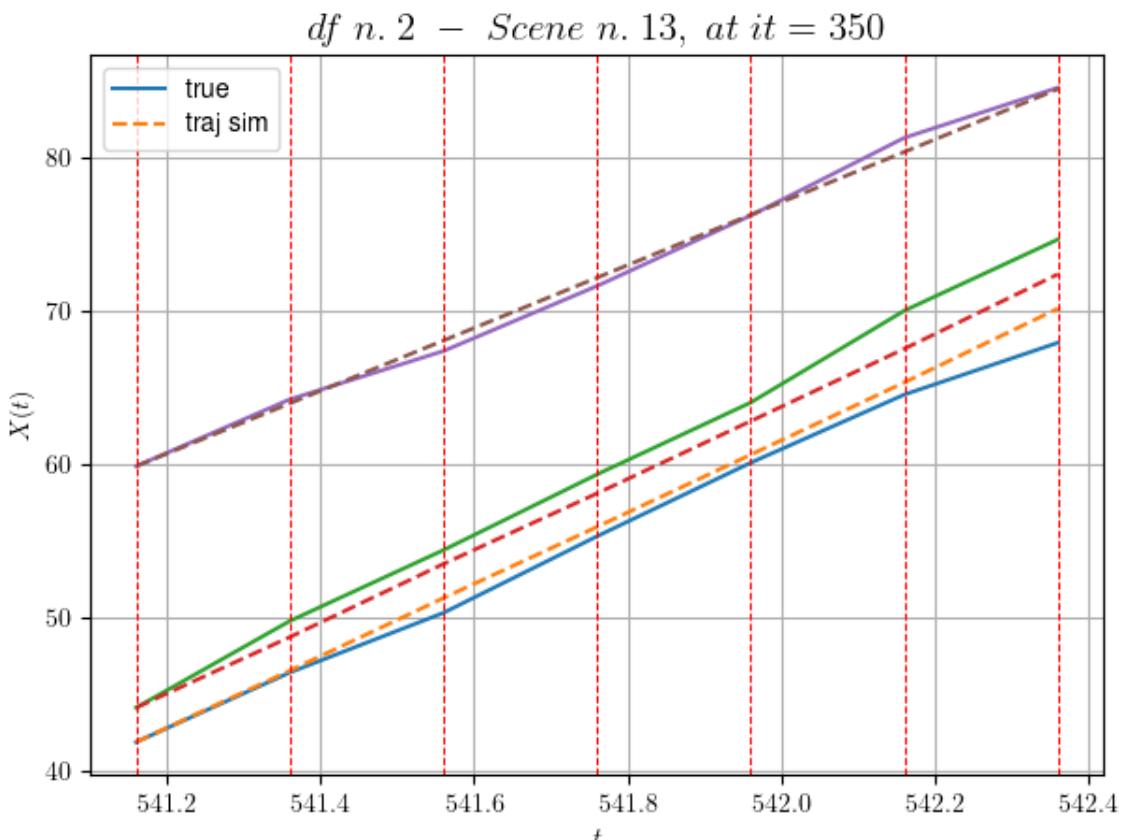
---

- Time interval n.5: [542.16, 542.36]
  - \* y\_true: [16.91142821 23.23526684]
  - \* v\_ann: [24.080703735351562, 24.307249069213867, 2

0.490059693196006]

---

- \* err= 1.195598432067478
- \* Learning rate NN = 0.00031381050939671695
- \* ~~df n. 2 - Scene n. 13, at it = 350~~



For scene 13/18

- \* use LR\_NN=0.001 with err=39.605107926153686 at it=19
- \* v0\_scn\_mean = 21.305128485774667
- \* MAE = 1.1875082863619661

---



---



---

- Time interval n.0: [549.76, 549.96]
  - \* y\_true: [23.30098965 17.25125335]
  - \* v\_ann: [21.746353149414062, 22.020225524902344, 2

2.495773750080495]

```

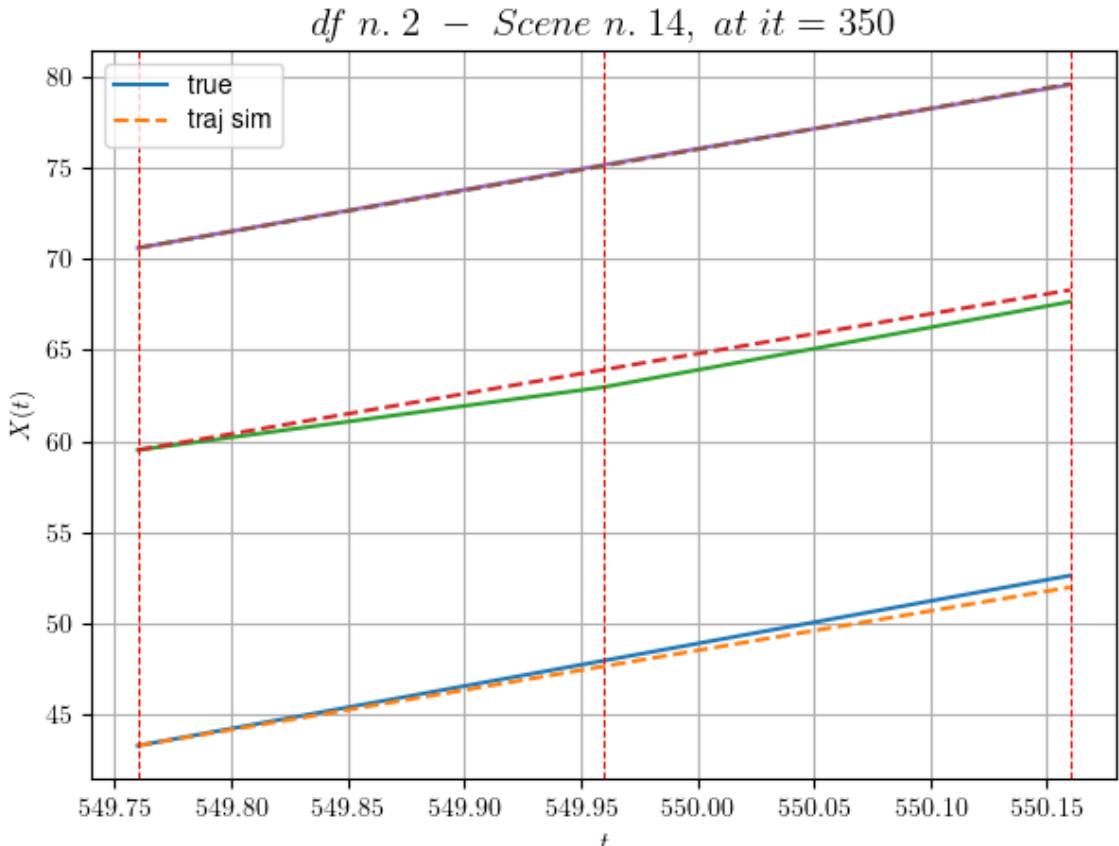
- Time interval n.1: [549.96, 550.16]
  * y_true: [23.30098965 23.35192881]
  * v_ann: [21.64873504638672, 21.820388793945312, 2
  2.495773750080495]

```

```

* err= 0.20484189397078048
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00017410100123282923

```



For scene 14/18

```

* use LR_NN=0.0001 with err=1.3889918151951812 at it=19
* v0_scn_mean = 23.138938736550113
* MAE = 0.20484189397078048

```

```

=====
=====
- Time interval n.0: [566.76, 566.96]
  * y_true: [31.35080123 25.9264585 ]
  * v_ann: [26.997697830200195, 26.42528533935547, 2
  4.22256213824868]

```

```

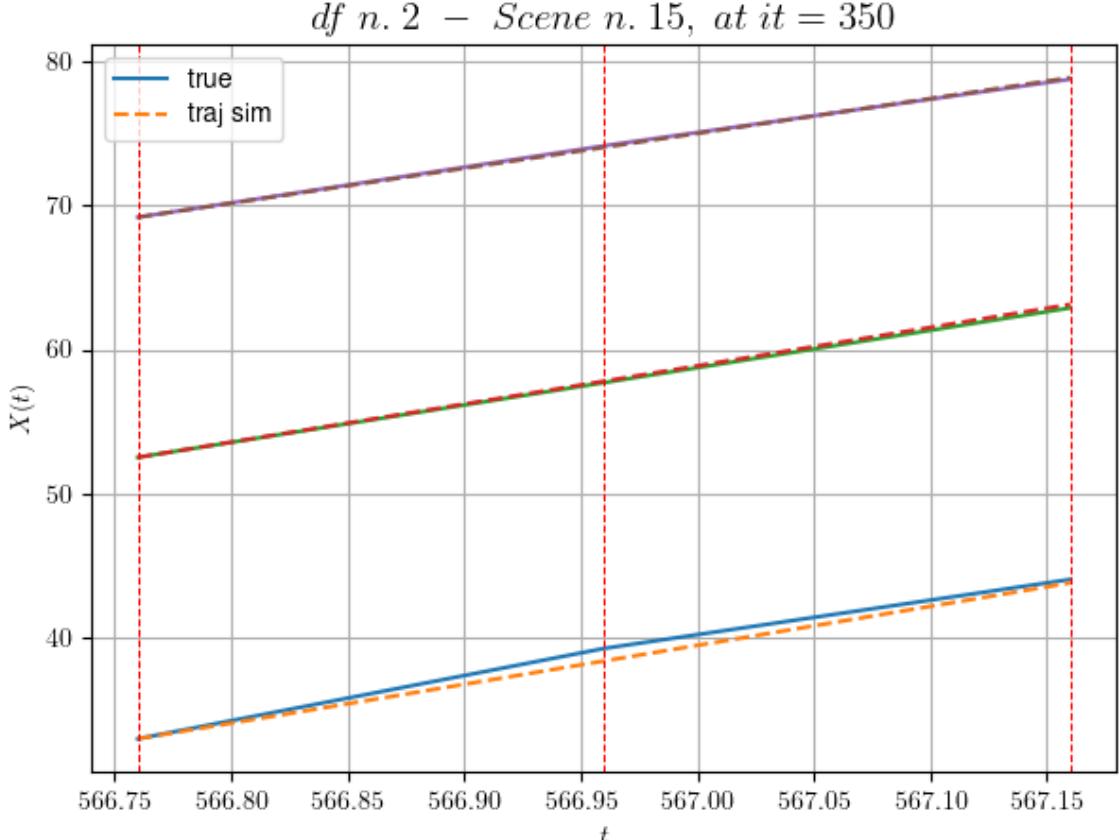
=====
=====
- Time interval n.1: [566.96, 567.16]
  * y_true: [23.95081051 25.9264585 ]
  * v_ann: [27.099895477294922, 26.671512603759766, 2
  4.22256213824868]

```

```

* err= 0.10153338285153457
* Learning rate NN = 7.289998757187277e-05
* diff = 7.290349316883826e-05

```



For scene 15/18

```

* use LR_NN=0.0001 with err=0.8367347870874643 at it=19
* v0_scn_mean = 24.717729210834154
* MAE = 0.10153338285153457

```

- 
- 
- Time interval n.0: [87.56, 87.76]
    - \* y\_true: [20.56019483 17.07029985 18.3510221 ]
    - \* v\_ann: [19.862003326416016, 20.42595672607422, 2  
0.146100997924805, 23.400041684740067]

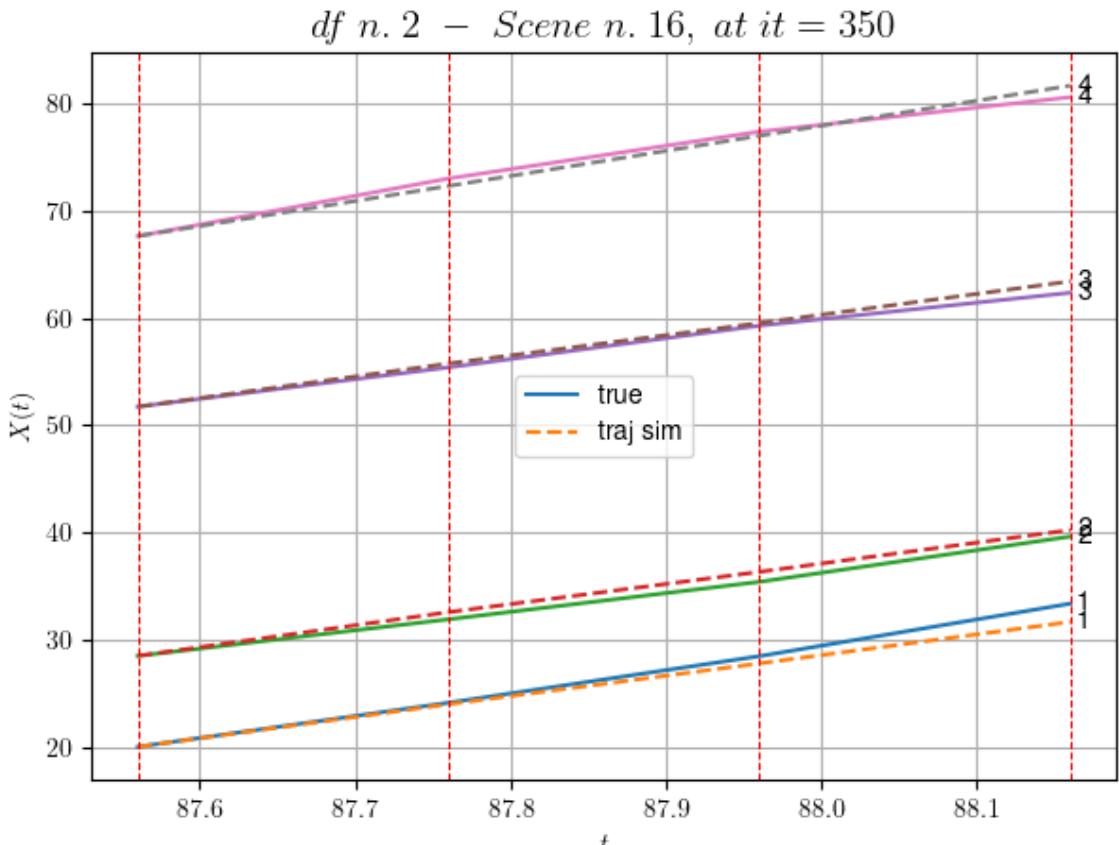
---

  - Time interval n.1: [87.76, 87.96]
    - \* y\_true: [21.72029145 17.49039467 19.46124504]
    - \* v\_ann: [19.03671646118164, 18.78673553466797, 18.  
880268096923828, 23.400041684740067]

---

  - Time interval n.2: [87.96, 88.16]
    - \* y\_true: [24.51045762 21.12058621 15.36109554]
    - \* v\_ann: [19.375213623046875, 19.51077651977539, 1  
9.464466094970703, 23.400041684740067]

```
* err= 0.5112987873664835
* Learning rate NN = 0.0005904899444431067
* diff = 4.573616774561362e-05
```



For scene 16/18

```
* use LR_NN=0.001 with err=9.998350180277026 at it=19
* v0_scn_mean = 24.153365501346634
* MAE = 0.5112987873664835
```

---



---

- Time interval n.0: [305.96, 306.16]  
 \* y\_true: [18.64270885 18.88070057 19.63111636]  
 \* v\_ann: [20.593276977539062, 20.563690185546875, 2  
 0.42917823791504, 13.683661586234264]

---



---

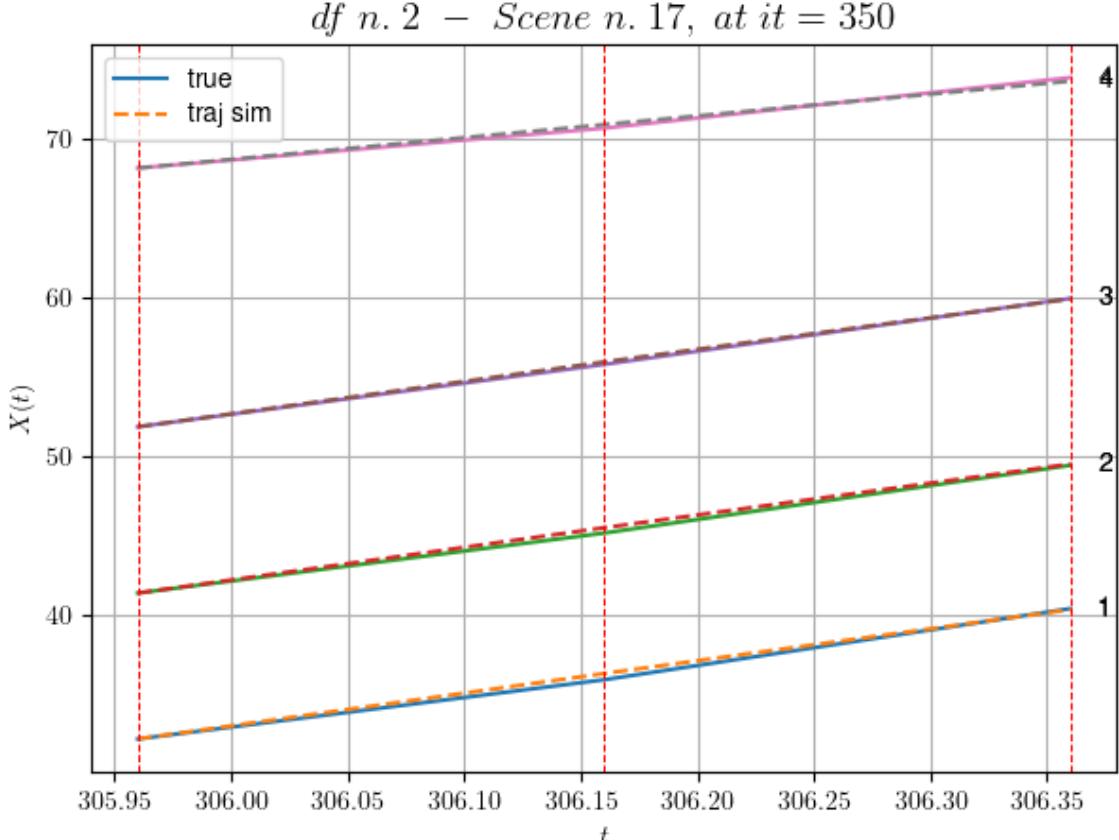
- Time interval n.1: [306.16, 306.36]  
 \* y\_true: [22.41204338 21.34093202 20.7913521 ]  
 \* v\_ann: [20.128864288330078, 20.060821533203125, 1  
 9.85150718688965, 13.683661586234264]

---



---

```
* err= 0.03387219595273282
* Learning rate NN = 0.00036449998151510954
* diff = 8.903472030821757e-06
```



For scene 17/18

- \* use LR\_NN=0.0005 with err=5.279898972146012 at it=19
- \* v0\_scn\_mean = 15.546019761812968
- \* MAE = 0.03371123143066157

---



---

For df=2 with 18 scenes, time taken: 196.39

---



---

In df n.3/10 we have 55 scenes

---



---

- Time interval n.0: [16.16, 16.36]
- \* y\_true: [27.36596872 40.6089382 ]
- \* v\_ann: [28.60688018798828, 27.132802963256836, 3 9.22721511204402]

---



---

- Time interval n.1: [16.36, 16.56]
- \* y\_true: [22.16572117 32.62072047]
- \* v\_ann: [29.325237274169922, 27.862966537475586, 3 9.22721511204402]

---

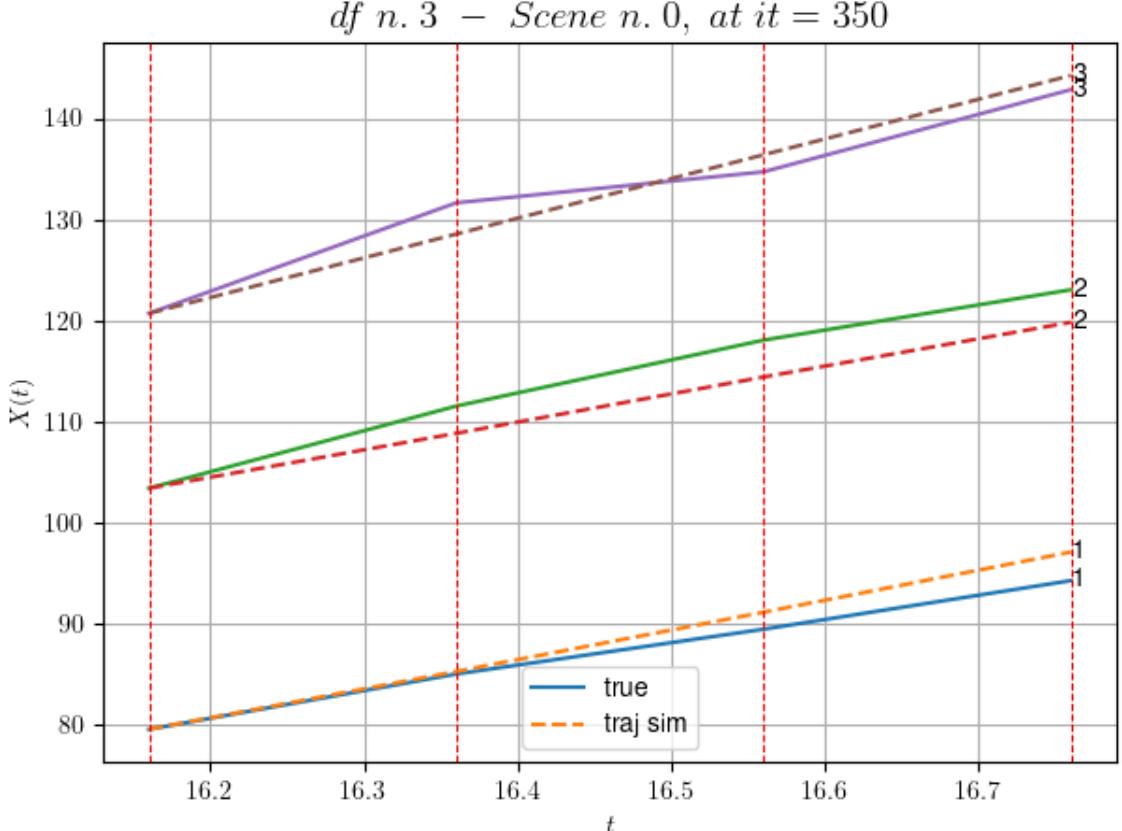


---

- Time interval n.2: [16.56, 16.76]

```
* y_true: [24.04131334 24.91936545]
* v_ann: [29.771902084350586, 27.053016662597656, 3
9.22721511204402]
```

```
-----  
-----  
* err= 4.680823871237975  
* Learning rate NN = 5.9048988987342454e-06  
* diff = 0.00390748833040977
```



For scene 0/55

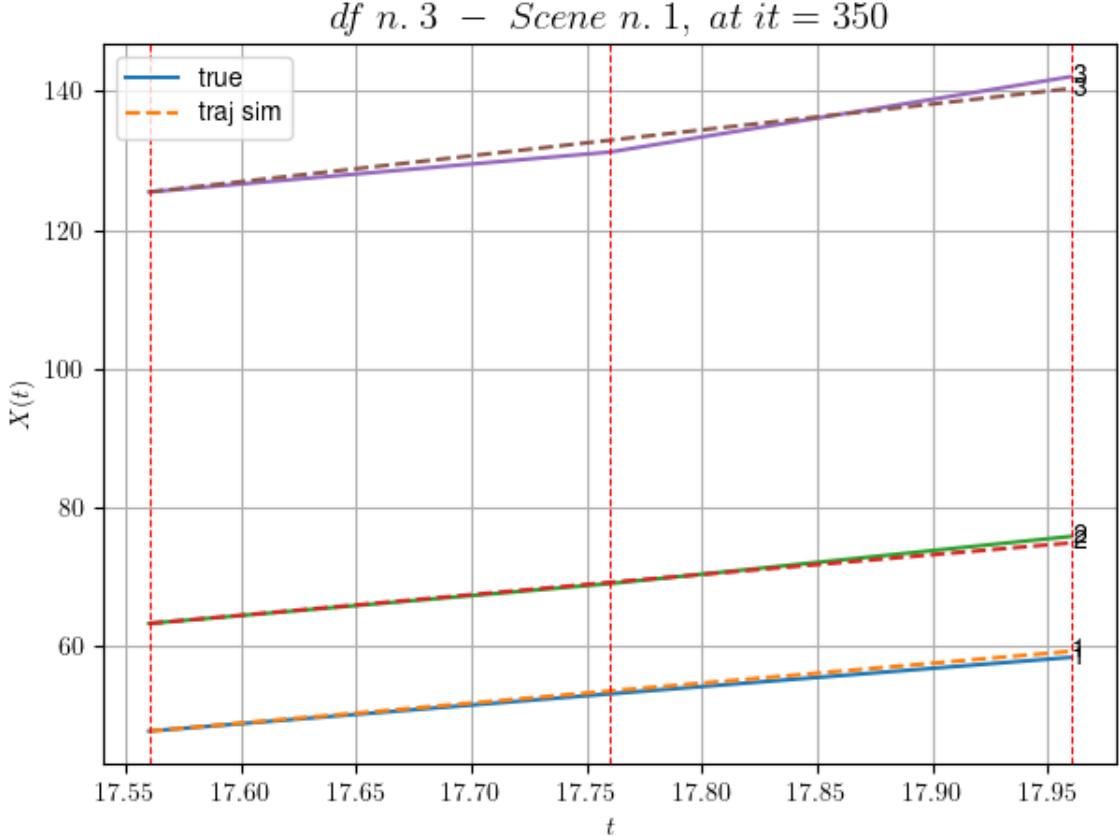
```
* use LR_NN=1e-05 with err=27.340458900975644 at it=19
* v0_scn_mean = 38.43637785780201
* MAE = 4.680823871237975
```

```
=====  
-----  
-----  
- Time interval n.0: [17.56, 17.76]  
* y_true: [26.87631442 28.75240293]  
* v_ann: [28.938079833984375, 29.66941261291504, 3
7.341555892655244]
```

```
-----  
-----  
- Time interval n.1: [17.76, 17.96]  
* y_true: [26.32655772 34.05345458]  
* v_ann: [28.617094039916992, 28.45901107788086, 3
7.341555892655244]
```

```
-----  
-----  
* err= 0.8493139192067908
```

\* Learning rate NN = 3.6449993785936385e-05  
 \* diff = 0.0014115300908561501



For scene 1/55

\* use LR\_NN=5e-05 with err=9.806470378773621 at it=19  
 \* v0\_scn\_mean = 36.7123329002885  
 \* MAE = 0.7604358123555377

- 
- 
- Time interval n.0: [23.96, 24.16]
    - \* y\_true: [31.9527567 21.95230333]
    - \* v\_ann: [25.41429328918457, 27.44501304626465, 27.016685910779763]

---

  - Time interval n.1: [24.16, 24.36]
    - \* y\_true: [26.79271708 14.85171745]
    - \* v\_ann: [25.350950241088867, 27.56077003479004, 27.016685910779763]

---

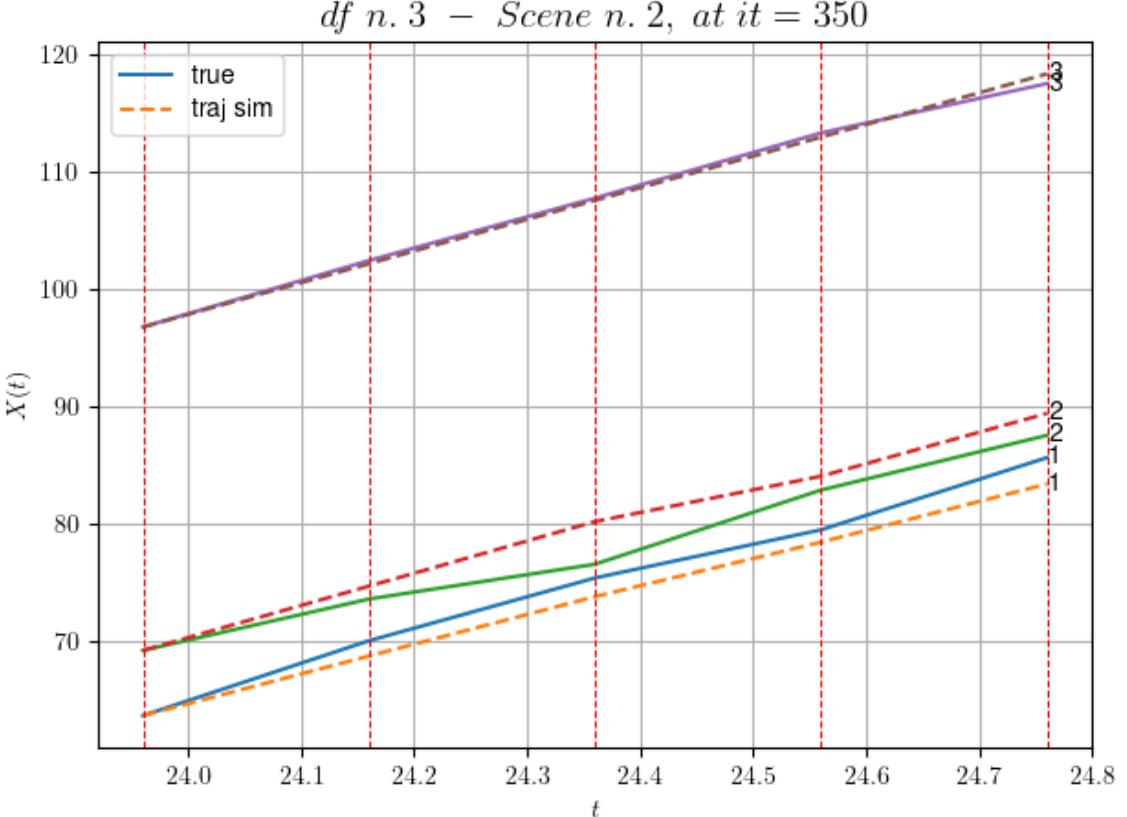
  - Time interval n.2: [24.36, 24.56]
    - \* y\_true: [20.5424093 31.65411216]
    - \* v\_ann: [23.273712158203125, 19.353574752807617, 27.016685910779763]

---

  - Time interval n.3: [24.56, 24.76]

```
* y_true: [30.8240747 23.35345154]
* v_ann: [24.806629180908203, 26.826244354248047, 2
7.016685910779763]
```

```
-----  
-----  
* err= 2.049085001974537  
* Learning rate NN = 0.000478296831715852  
* diff = 0.00035140182237336504
```



For scene 2/55

```
* use LR_NN=0.001 with err=38.235991512878904 at it=19
* v0_scn_mean = 27.27237691767749
* MAE = 2.049085001974537
```

```
=====  
=====  
- Time interval n.0: [42.96, 43.16]  
* y_true: [34.44093898 36.40531345]  
* v_ann: [25.41411590576172, 25.585107803344727, 2
7.3506925845114]
```

```
=====  
=====  
- Time interval n.1: [43.16, 43.36]  
* y_true: [27.09071898 44.10770887]  
* v_ann: [33.18497085571289, 31.9106502532959, 27.3
506925845114]
```

```
=====  
=====  
- Time interval n.2: [43.36, 43.56]  
* y_true: [24.51583897 25.2301032 ]
```

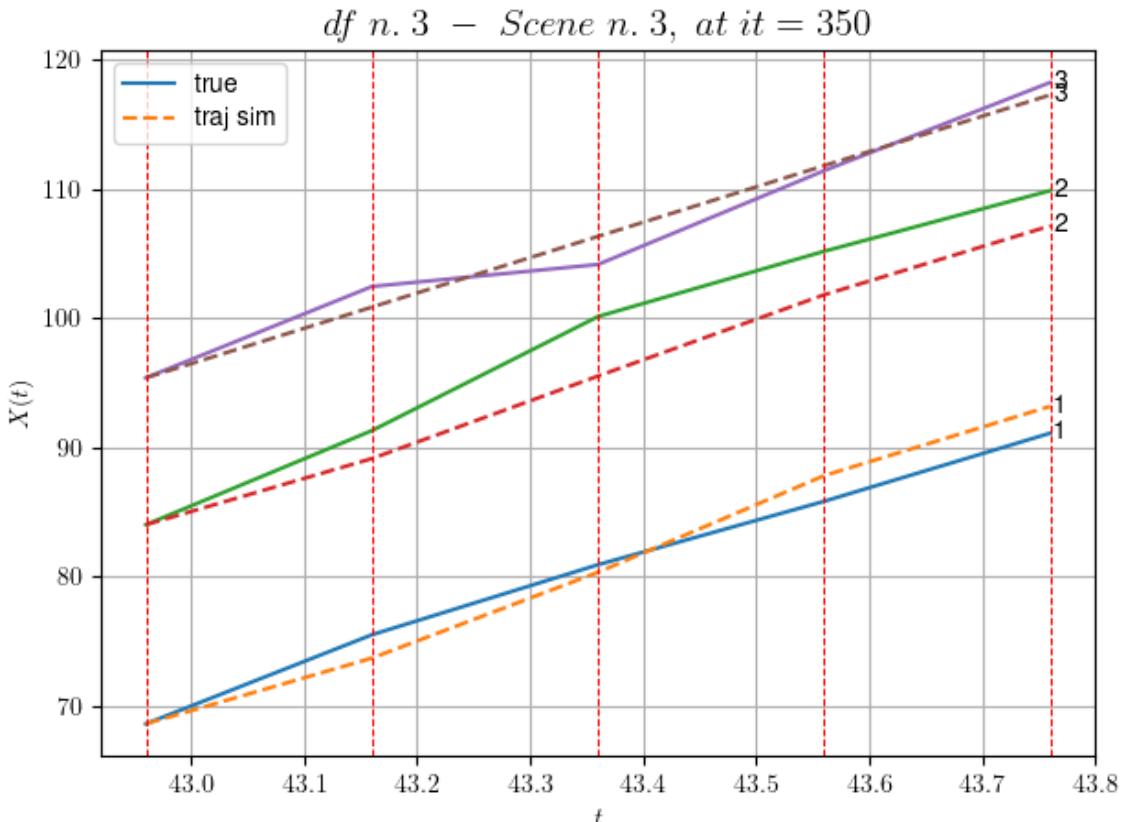
```
* v_ann: [37.383094787597656, 31.42262077331543, 2  
7.3506925845114]
```

---

```
- Time interval n.3: [43.56, 43.76]  
* y_true: [26.35394512 23.45522926]  
* v_ann: [26.810976028442383, 26.66518783569336, 2  
7.3506925845114]
```

---

```
* err= 4.3215519689988104  
* Learning rate NN = 0.000478296831715852  
* diff = 0.0017293707417831428
```



For scene 3/55

```
* use LR_NN=0.001 with err=24.563384478661856 at it=19  
* v0_scn_mean = 27.577756869527697  
* MAE = 3.593920579635546
```

---



---

```
- Time interval n.0: [61.76, 61.96]  
* y_true: [28.79377133 7.10177762]  
* v_ann: [31.76532745361328, 30.866474151611328, 2  
7.830106096169573]
```

---



---

```
- Time interval n.1: [61.96, 62.16]  
* y_true: [41.29768472 31.64601894]  
* v_ann: [20.60118865966797, 20.89558219909668, 27.
```

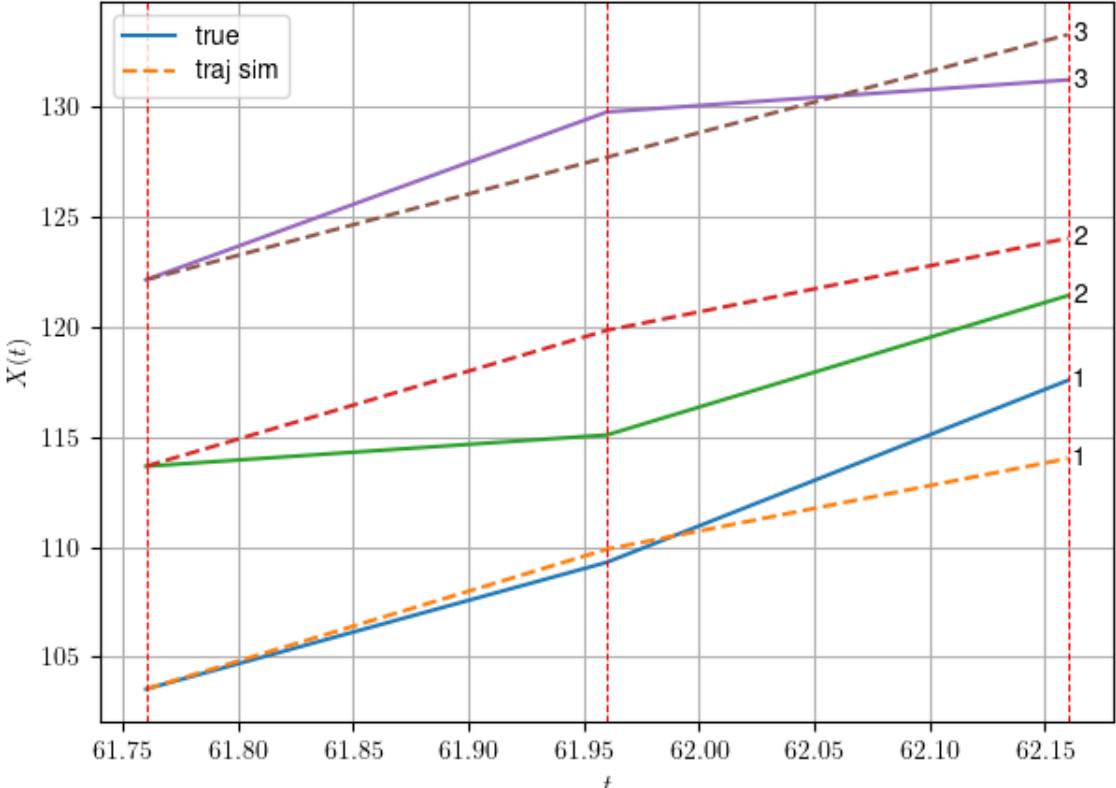
830106096169573]

```

-----
* err= 5.637087747202483
* Learning rate NN = 0.0007289999630302191
* diff = 0.0007384517493216336

```

*df n. 3 – Scene n. 4, at it = 350*



For scene 4/55

```

* use LR_NN=0.001 with err=7.443871671154651 at it=19
* v0_scn_mean = 28.01608127026752
* MAE = 5.609029257740553

```

3.83985492803373]

```

-----
- Time interval n.0: [63.76, 63.96]
  * y_true: [39.33120973 30.97229006]
  * v_ann: [31.309101104736328, 29.948591232299805, 3

```

3.83985492803373]

```

-----
- Time interval n.1: [63.96, 64.16]
  * y_true: [32.2308074 22.86038312]
  * v_ann: [32.450504302978516, 30.838237762451172, 3

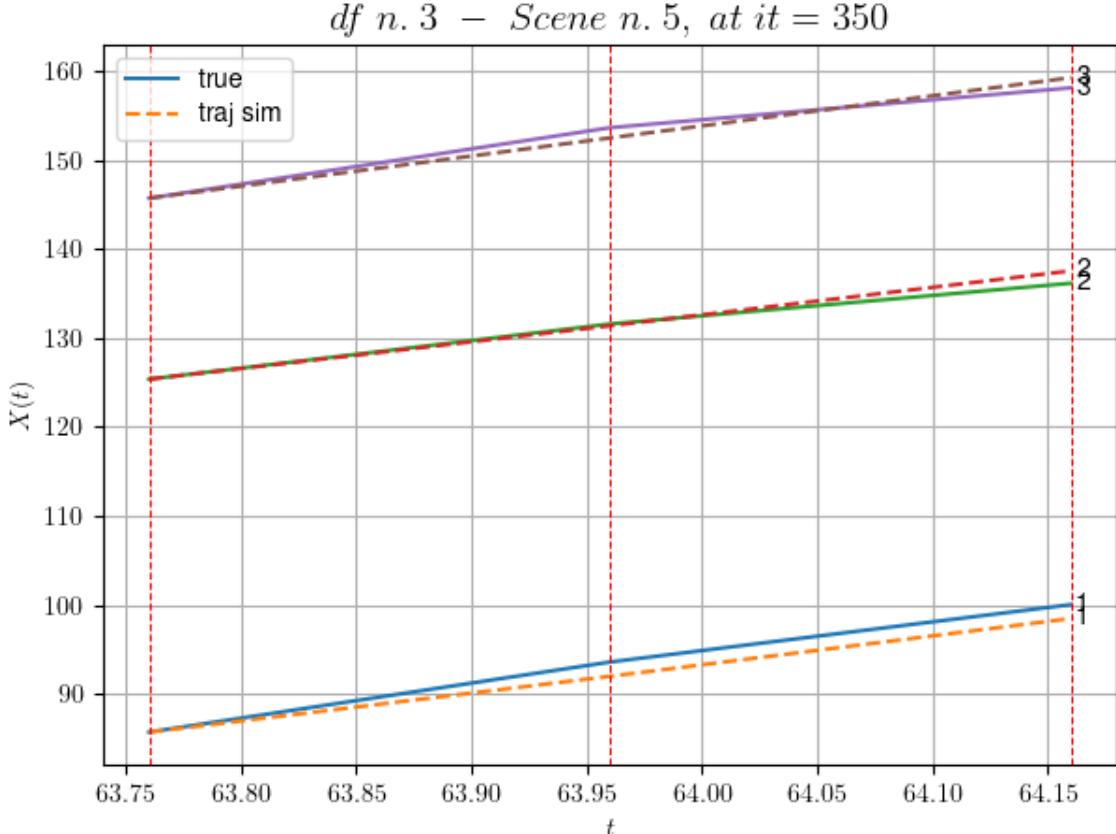
```

3.83985492803373]

```

-----
* err= 1.0677278327334832
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.004178342629852283

```



For scene 5/55

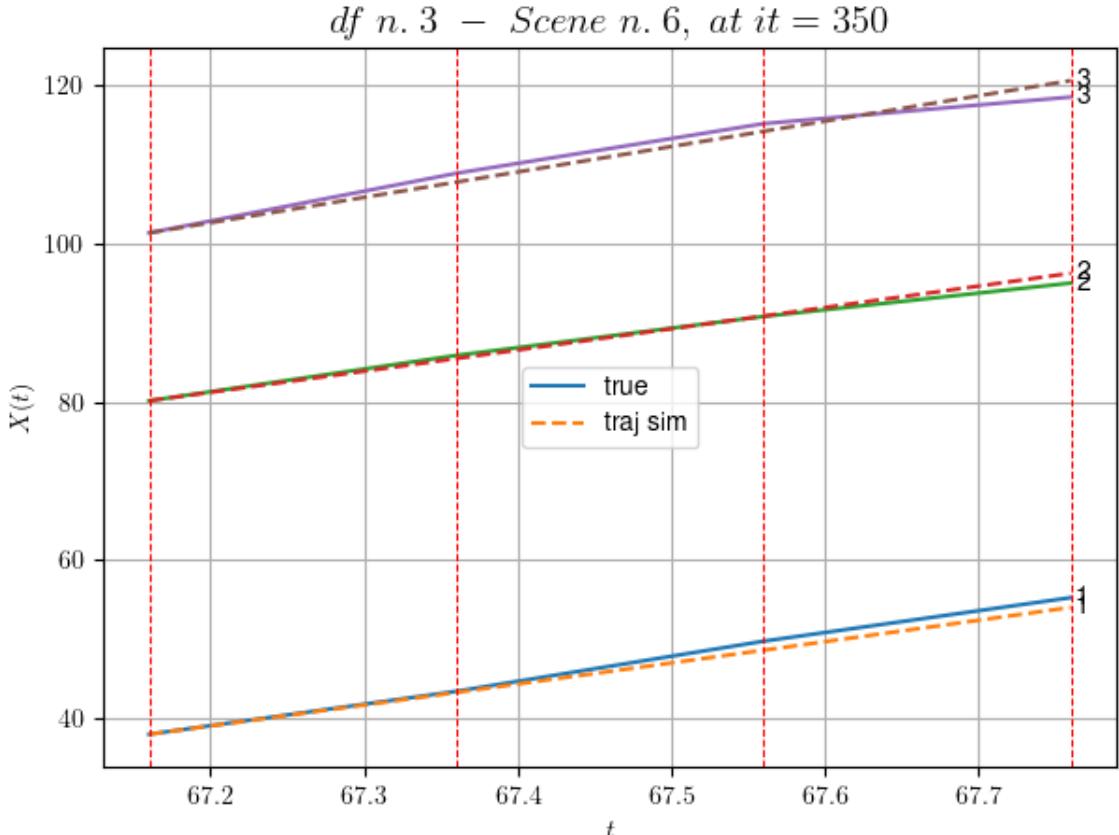
\* use LR\_NN=5e-05 with err=1.7489236868790965 at it=19  
 \* v0\_scn\_mean = 33.51075234495742  
 \* MAE = 0.7362438799134737

- Time interval n.0: [67.16, 67.36]  
 \* y\_true: [27.17586615 28.72375126]  
 \* v\_ann: [26.41227149963379, 26.724895477294922, 3  
 2.13930608407803]

- Time interval n.1: [67.36, 67.56]  
 \* y\_true: [31.70635664 24.62373081]  
 \* v\_ann: [26.76089096069336, 26.898839950561523, 3  
 2.13930608407803]

- Time interval n.2: [67.56, 67.76]  
 \* y\_true: [27.5714436 21.15852297]  
 \* v\_ann: [27.106061935424805, 27.096271514892578, 3  
 2.13930608407803]

\* err= 0.9253288290300675  
 \* Learning rate NN = 2.952449540316593e-05  
 \* diff = 0.0006499522934424462



For scene 6/55

```
* use LR_NN=5e-05 with err=4.209461120697944 at it=19
* v0_scn_mean = 31.955952501337016
* MAE = 0.9253288290300675
```

---



---

```
- Time interval n.0: [72.76, 72.96]
* y_true: [28.501496 30.93407752]
* v_ann: [31.571033477783203, 31.718721389770508, 2
8.121253838742728]
```

---

```
- Time interval n.1: [72.96, 73.16]
* y_true: [36.65243351 31.9148258 ]
* v_ann: [31.252765655517578, 31.571311950683594, 2
8.121253838742728]
```

---

```
- Time interval n.2: [73.16, 73.36]
* y_true: [27.70226144 28.33497935]
* v_ann: [31.723217010498047, 31.840129852294922, 2
8.121253838742728]
```

---

```
- Time interval n.3: [73.36, 73.56]
* y_true: [34.7534691 39.55781959]
* v_ann: [31.177661895751953, 31.59288215637207, 2
```

8.121253838742728]

```
- Time interval n.4: [73.56, 73.76]
  * y_true: [35.21414381 29.47666535]
  * v_ann: [32.01359176635742, 31.979663848876953, 2
```

8.121253838742728]

```
- Time interval n.5: [73.76, 73.96]
  * y_true: [30.89430642 26.20657024]
  * v_ann: [32.059967041015625, 32.0171012878418, 28.
```

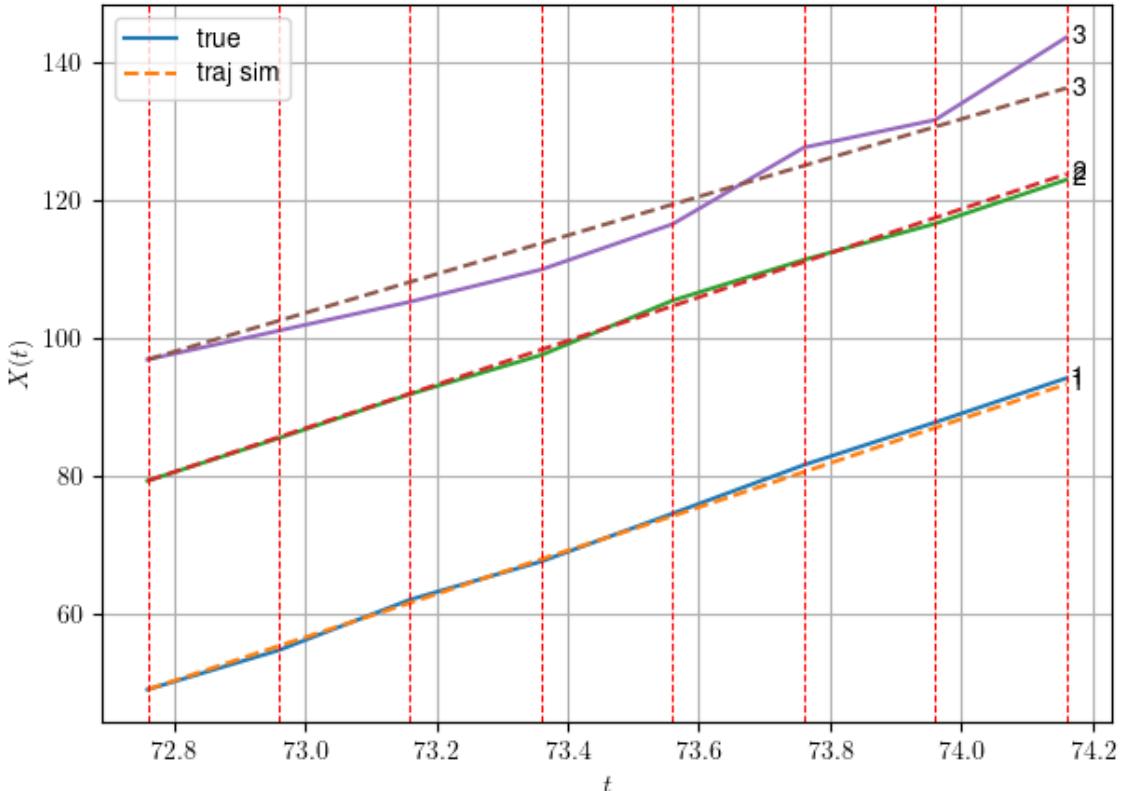
121253838742728]

```
- Time interval n.6: [73.96, 74.16]
  * y_true: [32.05509091 31.88895952]
  * v_ann: [31.53501319885254, 31.718700408935547, 2
```

8.121253838742728]

```
* err= 4.215720536512161
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.0006876472787613608
```

*df n. 3 – Scene n. 7, at it = 350*



For scene 7/55

```
* use LR_NN=0.0001 with err=48.66585514336963 at it=19
* v0_scn_mean = 28.282275602898547
* MAE = 3.8080566207267483
```

```

=====
=====

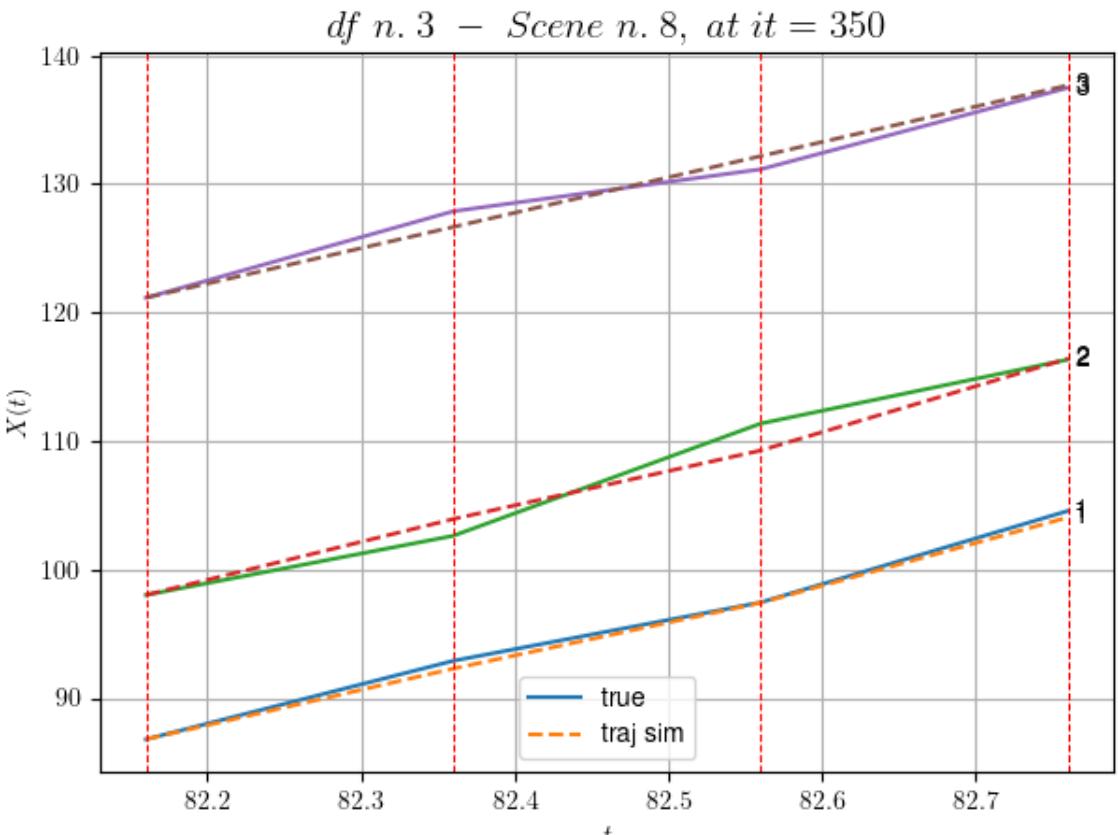
    - Time interval n.0: [82.16, 82.36]
      * y_true: [30.54468004 23.04450554]
      * v_ann: [27.507129669189453, 29.544471740722656, 2
7.55025511528052]

-----
    - Time interval n.1: [82.36, 82.56]
      * y_true: [22.71402344 43.65971655]
      * v_ann: [25.61023712158203, 26.682373046875, 27.55
025511528052]

-----
    - Time interval n.2: [82.56, 82.76]
      * y_true: [35.61686857 24.88594316]
      * v_ann: [33.24769973754883, 35.72968292236328, 27.
55025511528052]

-----
* err= 0.7737744001364814
* Learning rate NN = 0.0005904899444431067
* diff = 0.00010527680366880660

```



For scene 8/55

```

* use LR_NN=0.001 with err=7.475033758768159 at it=19
* v0_scn_mean = 27.760215487364633
* MAE = 0.7710029158486337

```

```

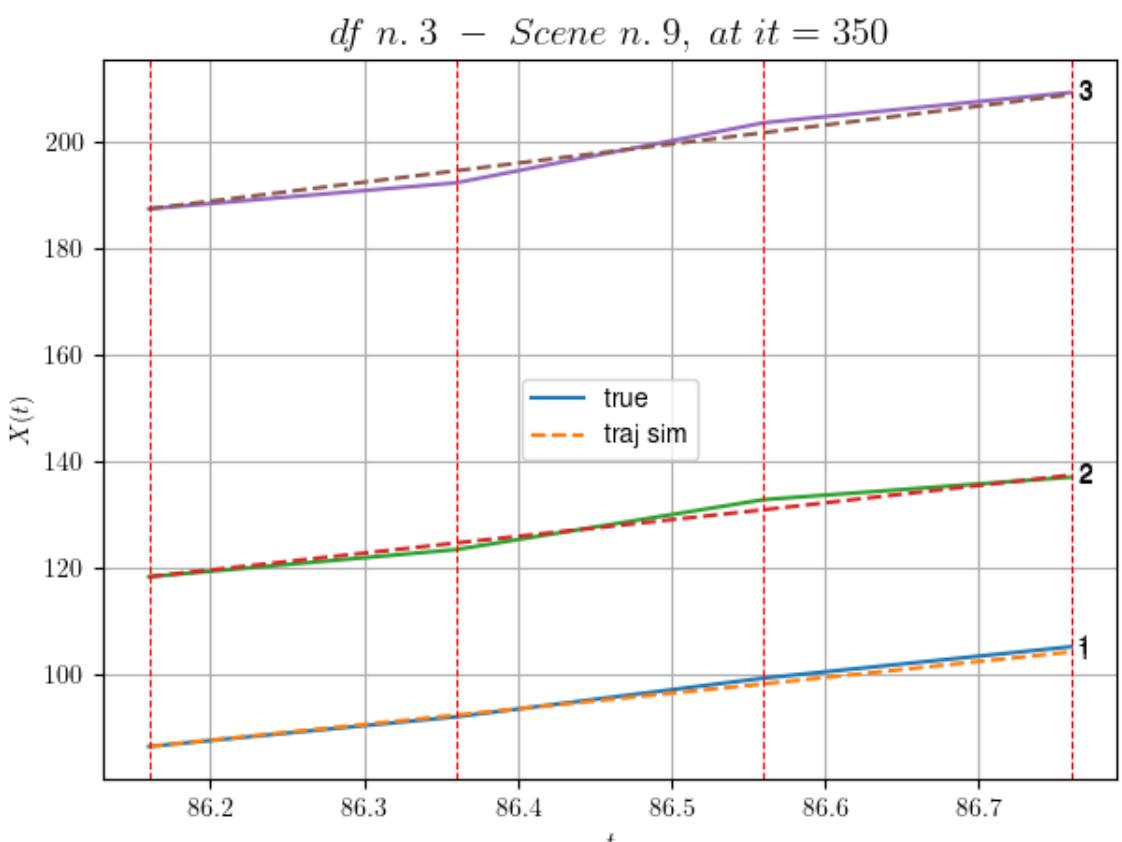
=====
- Time interval n.0: [86.16, 86.36]
  * y_true: [27.89181051 25.45740923]
  * v_ann: [29.499235153198242, 31.681957244873047, 3
  5.76469495843541]

=====
- Time interval n.1: [86.36, 86.56]
  * y_true: [36.25627338 46.92477715]
  * v_ann: [29.232192993164062, 31.164228439331055, 3
  5.76469495843541]

=====
- Time interval n.2: [86.56, 86.76]
  * y_true: [29.50579063 21.07714474]
  * v_ann: [29.990726470947266, 32.58525848388672, 3
  5.76469495843541]

=====
* err= 1.3597862351988734
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.002114609661803657

```



For scene 9/55  
 \* use LR\_NN=1e-05 with err=12.845137122363345 at it=19  
 \* v0\_scn\_mean = 35.27062004231874  
 \* MAE = 1.3597862351988734

```
=====
- Time interval n.0: [130.96, 131.16]
  * y_true: [15.85249734 39.95916833]
  * v_ann: [32.50764083862305, 31.19352149963379, 31.
52325223025]

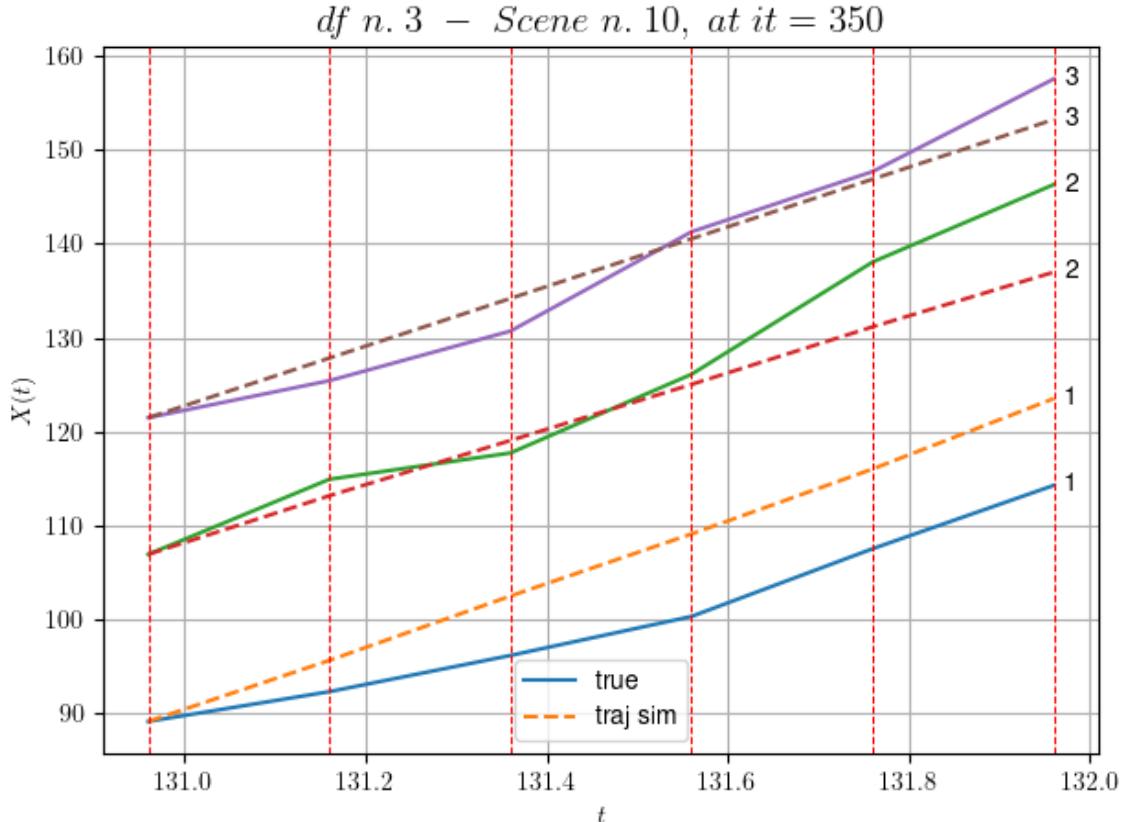
-----
- Time interval n.1: [131.16, 131.36]
  * y_true: [19.2732587 14.0236874]
  * v_ann: [34.256996154785156, 29.43083953857422, 3
1.752325223025]

-----
- Time interval n.2: [131.36, 131.56]
  * y_true: [20.77382027 41.90201833]
  * v_ann: [33.05005645751953, 29.8587646484375, 31.7
52325223025]

-----
- Time interval n.3: [131.56, 131.76]
  * y_true: [36.06757222 59.75967406]
  * v_ann: [34.596858978271484, 30.659656524658203, 3
1.752325223025]

-----
- Time interval n.4: [131.76, 131.96]
  * y_true: [33.71775213 41.23564164]
  * v_ann: [37.4815673828125, 29.10591697692871, 31.7
52325223025]

-----
* err= 25.783081632763004
* Learning rate NN = 1.9371018424862996e-05
* diff = 0.003452940566180729
```



For scene 10/55

\* use LR\_NN=5e-05 with err=59.64885310952267 at it=19

\* v0\_scn\_mean = 31.60213862272465

\* MAE = 20.165316250270234

- Time interval n.0: [139.16, 139.36]  
 \* y\_true: [22.50033849 31.62238978]  
 \* v\_ann: [27.869359970092773, 27.59697723388672, 2  
 8.144643973847053]

- Time interval n.1: [139.36, 139.56]  
 \* y\_true: [29.90063418 17.15160439]  
 \* v\_ann: [27.855087280273438, 27.600290298461914, 2  
 8.144643973847053]

- Time interval n.2: [139.56, 139.76]  
 \* y\_true: [27.10078793 37.57385655]  
 \* v\_ann: [27.66400146484375, 27.553363800048828, 2  
 8.144643973847053]

- Time interval n.3: [139.76, 139.96]  
 \* y\_true: [25.40095052 21.65266443]  
 \* v\_ann: [27.854726791381836, 27.588855743408203, 2  
 8.144643973847053]

```
- Time interval n.4: [139.96, 140.16]
  * y_true: [21.40097883 32.03445568]
  * v_ann: [27.680187225341797, 27.56110382080078, 2
8.144643973847053]

-----
- Time interval n.5: [140.16, 140.36]
  * y_true: [21.7011754 31.91506312]
  * v_ann: [27.648746490478516, 27.538774490356445, 2
8.144643973847053]

-----
- Time interval n.6: [140.36, 140.56]
  * y_true: [30.50199276 23.65435061]
  * v_ann: [27.619674682617188, 27.533206939697266, 2
8.144643973847053]

-----
- Time interval n.7: [140.56, 140.76]
  * y_true: [27.90220498 42.04863469]
  * v_ann: [27.593704223632812, 27.533832550048828, 2
8.144643973847053]

-----
- Time interval n.8: [140.76, 140.96]
  * y_true: [45.30444602 33.92792147]
  * v_ann: [27.942218780517578, 27.589731216430664, 2
8.144643973847053]

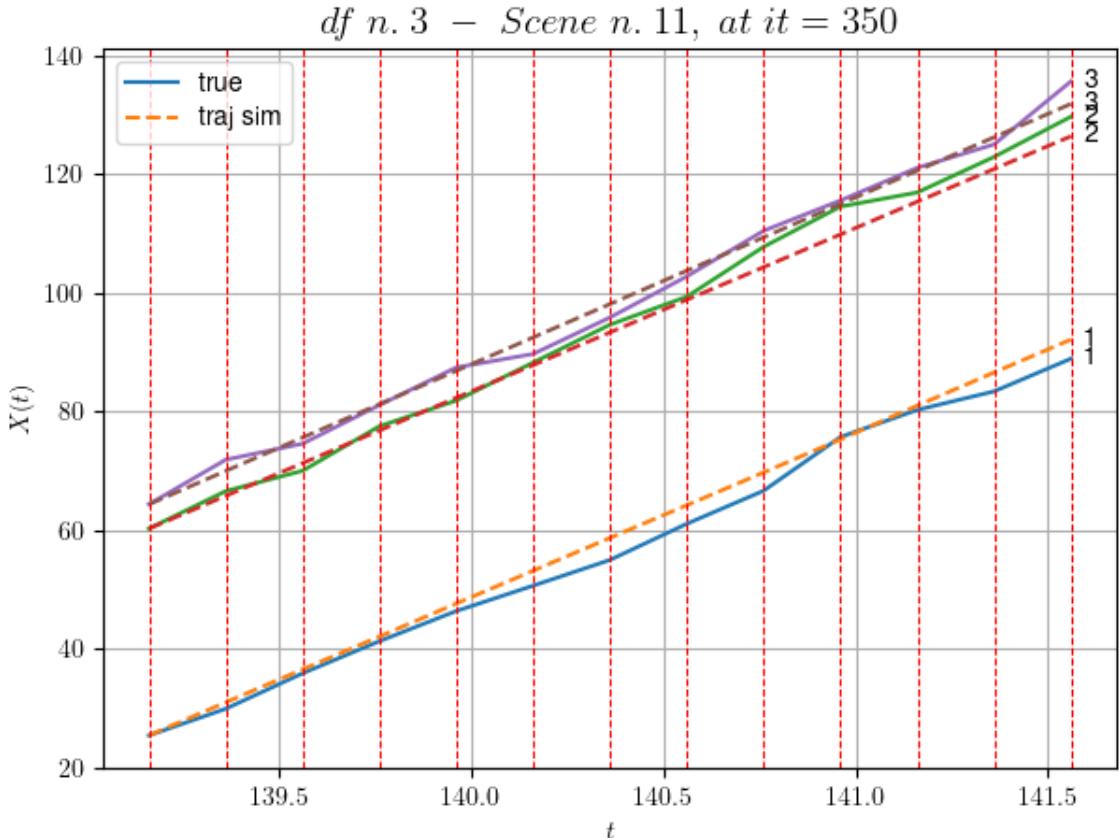
-----
- Time interval n.9: [140.96, 141.16]
  * y_true: [22.85268623 11.9131035 ]
  * v_ann: [28.46516227722168, 27.64655113220215, 28.
144643973847053]

-----
- Time interval n.10: [141.16, 141.36]
  * y_true: [15.65202595 30.01833255]
  * v_ann: [27.969467163085938, 27.615615844726562, 2
8.144643973847053]

-----
- Time interval n.11: [141.36, 141.56]
  * y_true: [27.55395105 33.94025545]
  * v_ann: [27.77617835998535, 27.55776023864746, 28.
144643973847053]

-----
* err= 4.039668454294037
```

\* Learning rate NN = 8.862932190822903e-06  
 \* diff = 0.003638301564742541



For scene 11/55

\* use LR\_NN=0.0001 with err=446.9438954303257 at it=19  
 \* v0\_scn\_mean = 28.30366103886055  
 \* MAE = 3.9300596927933964

---



---

- Time interval n.0: [143.76, 143.96]

\* y\_true: [30.62207823 41.7261053 ]

\* v\_ann: [30.38348960876465, 30.27963638305664, 29.  
 414748692205094]

---



---

- Time interval n.1: [143.96, 144.16]

\* y\_true: [21.21173425 33.31570327]

\* v\_ann: [31.1810245513916, 30.66285514831543, 29.4  
 414748692205094]

---



---

- Time interval n.2: [144.16, 144.36]

\* y\_true: [29.72284222 27.36558717]

\* v\_ann: [30.7353572845459, 30.388744354248047, 29.  
 414748692205094]

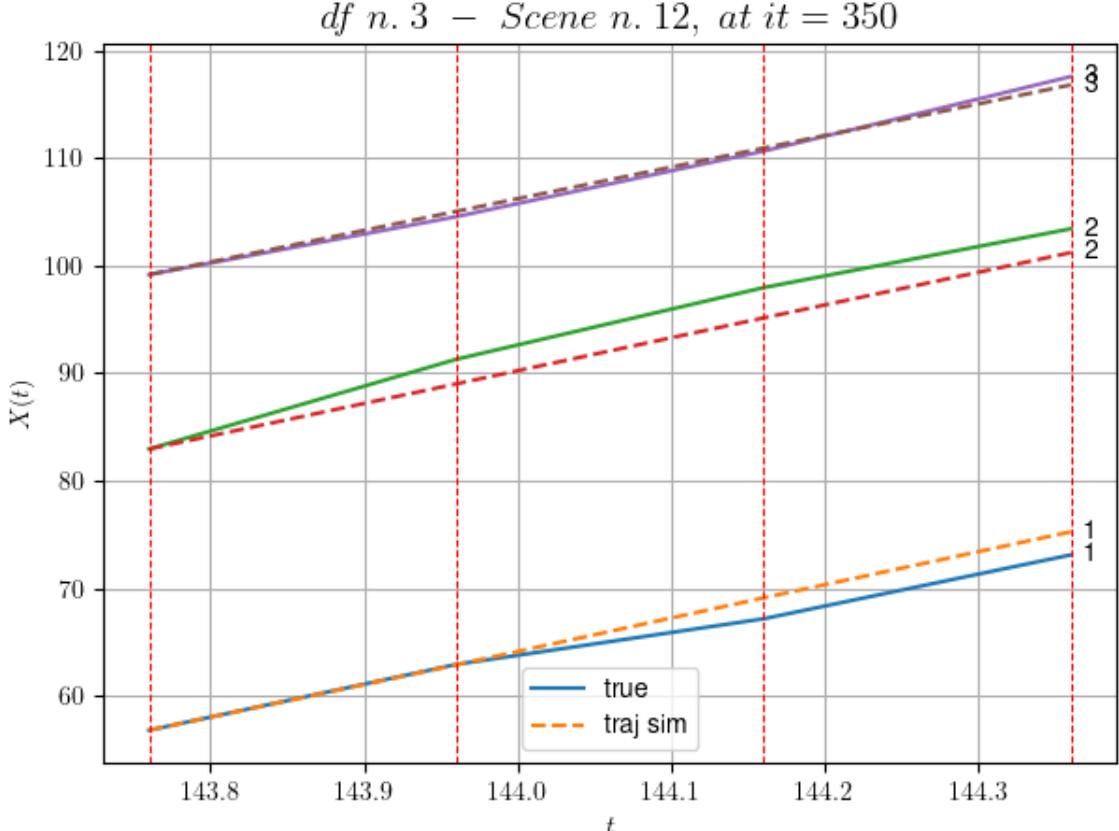
---



---

\* err= 2.2857983783890305

\* Learning rate NN = 2.952449540316593e-05  
 \* diff = 0.0034974070115572076



For scene 12/55

\* use LR\_NN=5e-05 with err=17.70035140949838 at it=19  
 \* v0\_scn\_mean = 29.464908846886736  
 \* MAE = 2.2857983783890305

- 
- 
- Time interval n.0: [149.36, 149.56]
    - \* y\_true: [25.90049539 27.45094024]
    - \* v\_ann: [27.39385986328125, 27.234424591064453, 23.443602704289464]

---

  - Time interval n.1: [149.56, 149.76]
    - \* y\_true: [21.18057417 22.42095425]
    - \* v\_ann: [27.383100509643555, 27.180583953857422, 23.443602704289464]

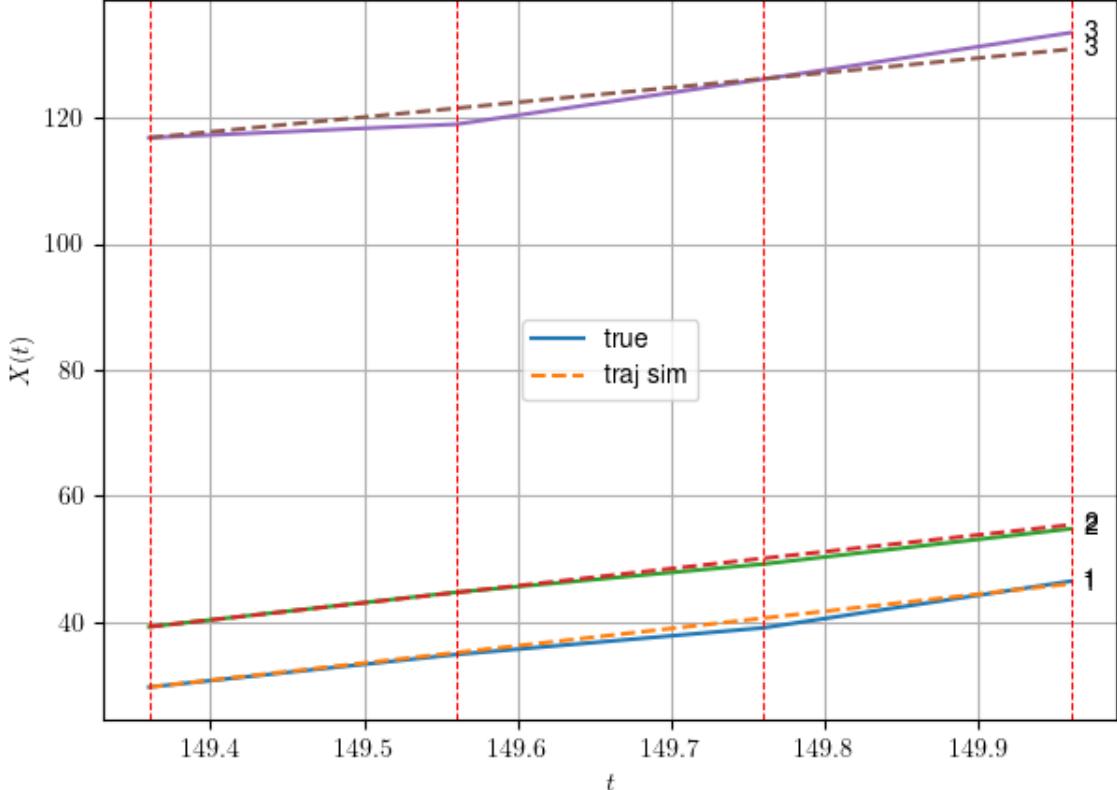
---

  - Time interval n.2: [149.76, 149.96]
    - \* y\_true: [37.02126181 27.98148311]
    - \* v\_ann: [27.290767669677734, 26.595870971679688, 23.443602704289464]

---
- \* err= 1.4365840834055073

\* Learning rate NN = 5.9048988987342454e-06  
 \* diff = 0.0000270520153047802

df n. 3 - Scene n. 13, at it = 350



For scene 13/55

\* use LR\_NN=1e-05 with err=26.67542827537676 at it=19  
 \* v0\_scn\_mean = 24.005532080823883  
 \* MAE = 1.4365840834055073

---



---

- Time interval n.0: [156.16, 156.36]  
 \* y\_true: [12.56997445 35.72646923]  
 \* v\_ann: [28.55571937561035, 30.04335594177246, 36.  
 779567918368514]

---

- Time interval n.1: [156.36, 156.56]  
 \* y\_true: [42.07610638 31.26485338]  
 \* v\_ann: [29.30654525756836, 29.905115127563477, 3  
 6.779567918368514]

---

- Time interval n.2: [156.56, 156.76]  
 \* y\_true: [30.09491831 26.35466702]  
 \* v\_ann: [29.30937957763672, 30.182626724243164, 3  
 6.779567918368514]

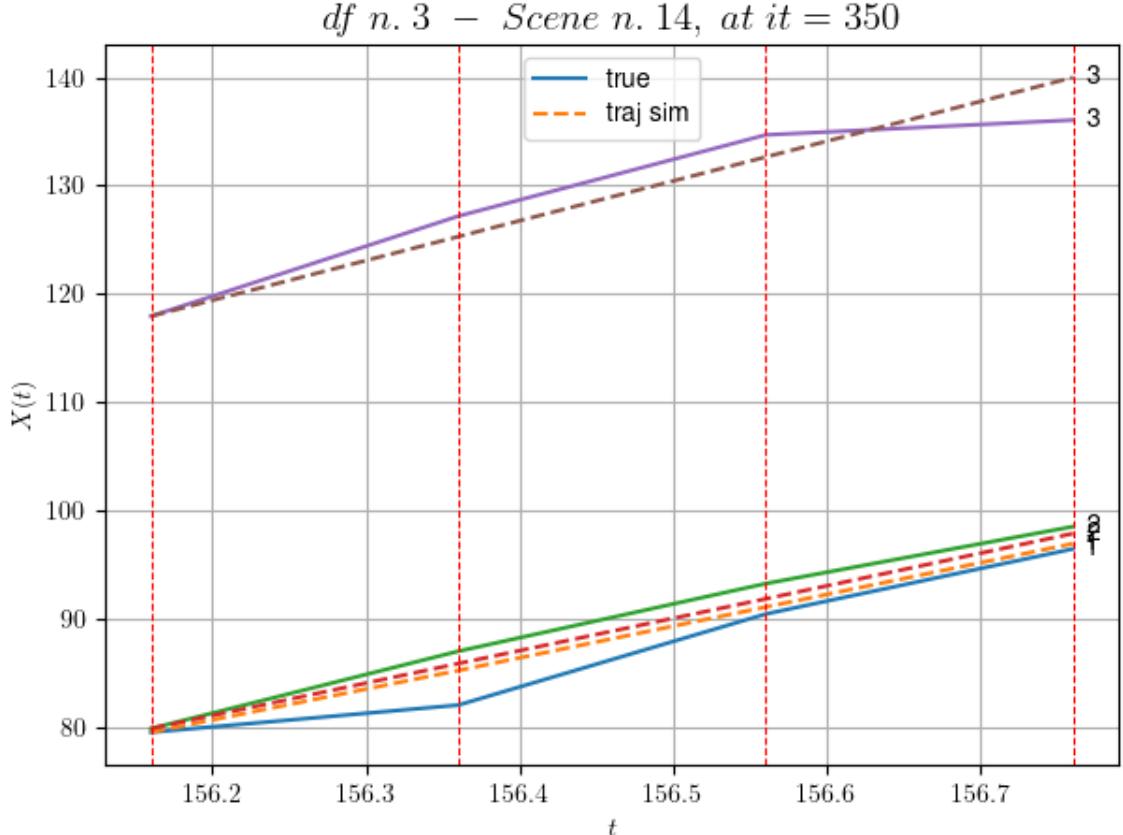
---



---

\* err= 3.1510107827506597  
 \* Learning rate NN = 5.9048988987342454e-06

\* diff = 0.002307944792510064



For scene 14/55

\* use LR\_NN=1e-05 with err=32.05035098680883 at it=19  
 \* v0\_scn\_mean = 36.19851124932992  
 \* MAE = 2.759395152180156

---



---

- Time interval n.0: [207.96, 208.16]  
 \* y\_true: [30.12104774 28.85226703]  
 \* v\_ann: [30.580976486206055, 30.362916946411133, 3  
 1.124901516782685]

---

- Time interval n.1: [208.16, 208.36]  
 \* y\_true: [31.19139939 27.73265496]  
 \* v\_ann: [29.864397048950195, 29.972373962402344, 3  
 1.124901516782685]

---

- Time interval n.2: [208.36, 208.56]  
 \* y\_true: [31.59181924 26.81292648]  
 \* v\_ann: [29.569700241088867, 29.7488956451416, 31.  
 124901516782685]

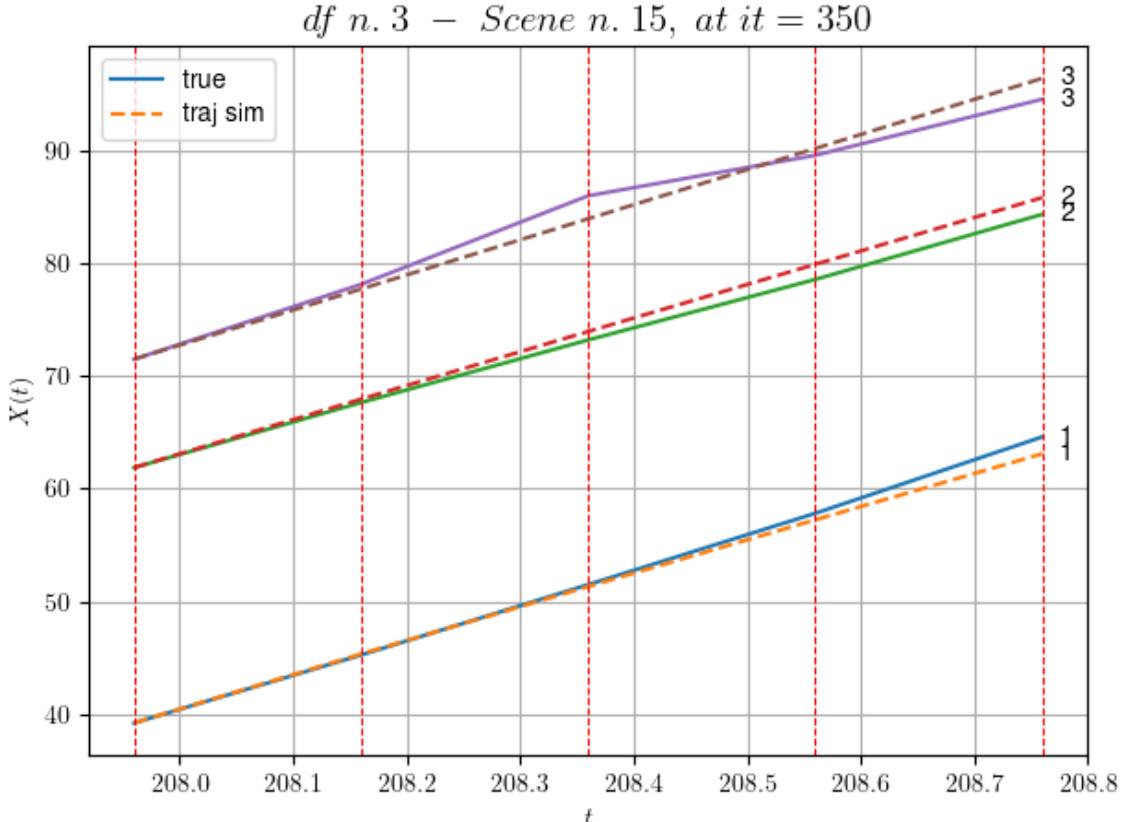
---

- Time interval n.3: [208.56, 208.76]  
 \* y\_true: [33.88244728 28.87369213]

```
* v_ann: [29.290712356567383, 29.59772300720215, 3  
1.124901516782685]
```

---

```
* err= 1.02486399512204  
* Learning rate NN = 0.000239148415857926  
* diff = 6.889216046213065e-05
```



For scene 15/55

```
* use LR_NN=0.0005 with err=10.874439647690552 at it=19  
* v0_scn_mean = 31.028489542419454  
* MAE = 0.887758603097964
```

---



---

```
- Time interval n.0: [218.16, 218.36]  
* y_true: [26.47083003 31.40159485]  
* v_ann: [31.252395629882812, 31.398469924926758, 3  
1.94691151510619]
```

---



---

```
- Time interval n.1: [218.36, 218.56]  
* y_true: [32.09751616 29.50187244]  
* v_ann: [31.15485191345215, 31.18132209777832, 31.  
94691151510619]
```

---



---

```
- Time interval n.2: [218.56, 218.76]  
* y_true: [31.61167285 38.50305628]
```

```

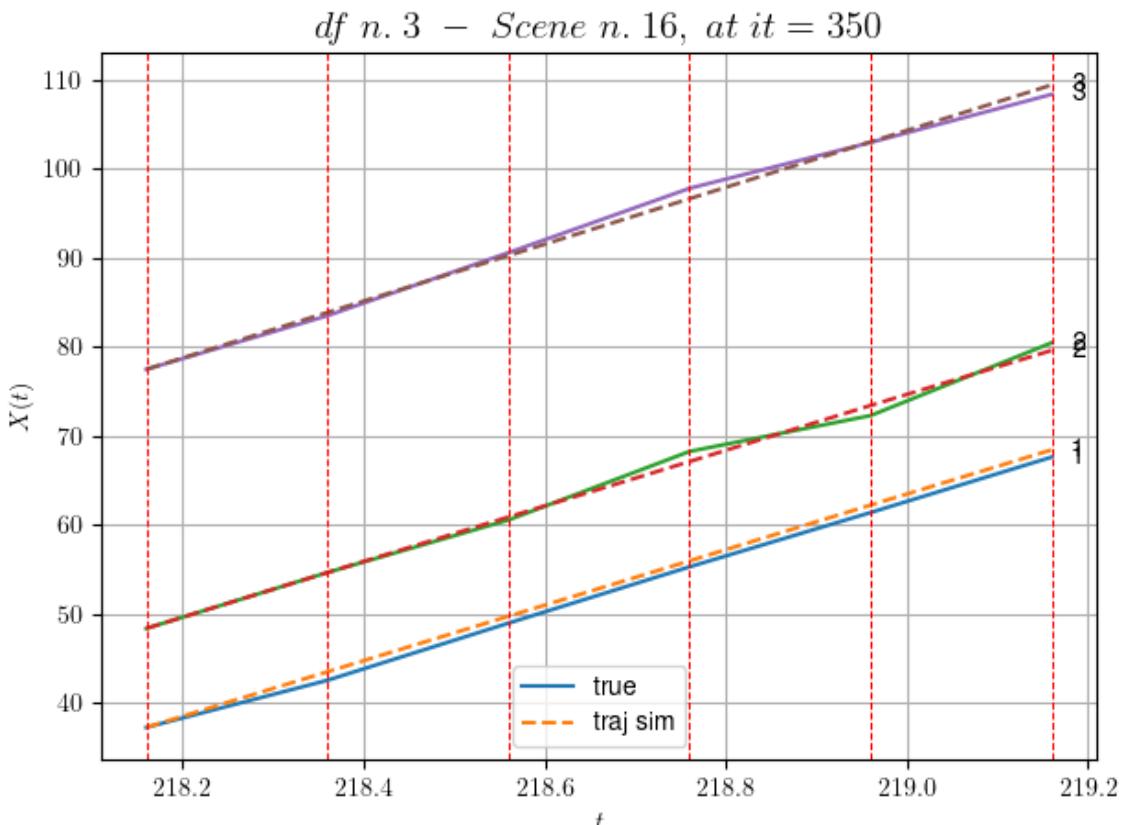
* v_ann: [31.138092041015625, 31.148332595825195, 3
1.94691151510619]

-----
- Time interval n.3: [218.76, 218.96]
* y_true: [30.522016 20.15190279]
* v_ann: [31.323476791381836, 31.513927459716797, 3
1.94691151510619]

-----
- Time interval n.4: [218.96, 219.16]
* y_true: [31.13252968 40.9045659 ]
* v_ann: [31.042137145996094, 30.923633575439453, 3
1.94691151510619]

-----
* err= 0.5260267415796146
* Learning rate NN = 1.9371018424862996e-05
* diff = 0.0001920220022011605

```



For scene 16/55

```

* use LR_NN=5e-05 with err=30.004485171431742 at it=19
* v0_scn_mean = 31.780047500540046
* MAE = 0.49265211875209486

```

---



---



---

- Time interval n.0: [222.96, 223.16]  
\* y\_true: [37.21103813 39.71315438]  
\* v\_ann: [35.337135314941406, 34.340389251708984, 3

1.27974144015426]

---

- Time interval n.1: [223.16, 223.36]
  - \* y\_true: [31.35126998 28.99272163]
  - \* v\_ann: [36.21866989135742, 34.44675827026367, 31.

27974144015426]

---

- Time interval n.2: [223.36, 223.56]
  - \* y\_true: [33.72173898 31.78369531]
  - \* v\_ann: [34.99710464477539, 33.81270217895508, 31.

27974144015426]

---

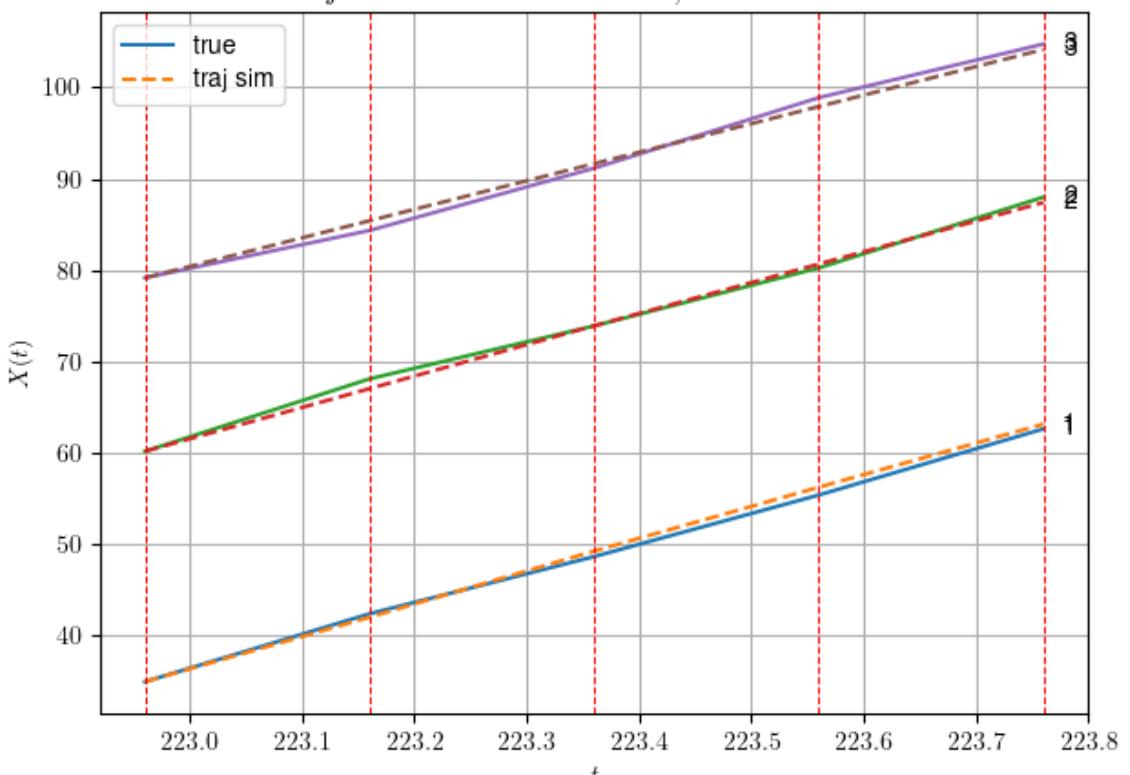
- Time interval n.3: [223.56, 223.76]
  - \* y\_true: [36.23248355 38.79526469]
  - \* v\_ann: [34.573944091796875, 33.729827880859375, 31.

1.27974144015426]

---

- \* err= 0.39115293290845976
- \* Learning rate NN = 4.7829678806010634e-05
- \* diff = 0.0002881976953592602

*df n. 3 – Scene n. 17, at it = 350*



For scene 17/55

- \* use LR\_NN=0.0001 with err=6.2440216860399325 at it=19
- \* v0\_scn\_mean = 31.17005859496375
- \* MAE = 0.39115293290845976

```
=====
- Time interval n.0: [247.36, 247.56]
  * y_true: [24.34113117 25.37248976]
  * v_ann: [31.472835540771484, 25.967193603515625, 2
9.199550876740744]

-----
- Time interval n.1: [247.56, 247.76]
  * y_true: [20.86113385 27.00305492]
  * v_ann: [27.733867645263672, 23.897748947143555, 2
9.199550876740744]

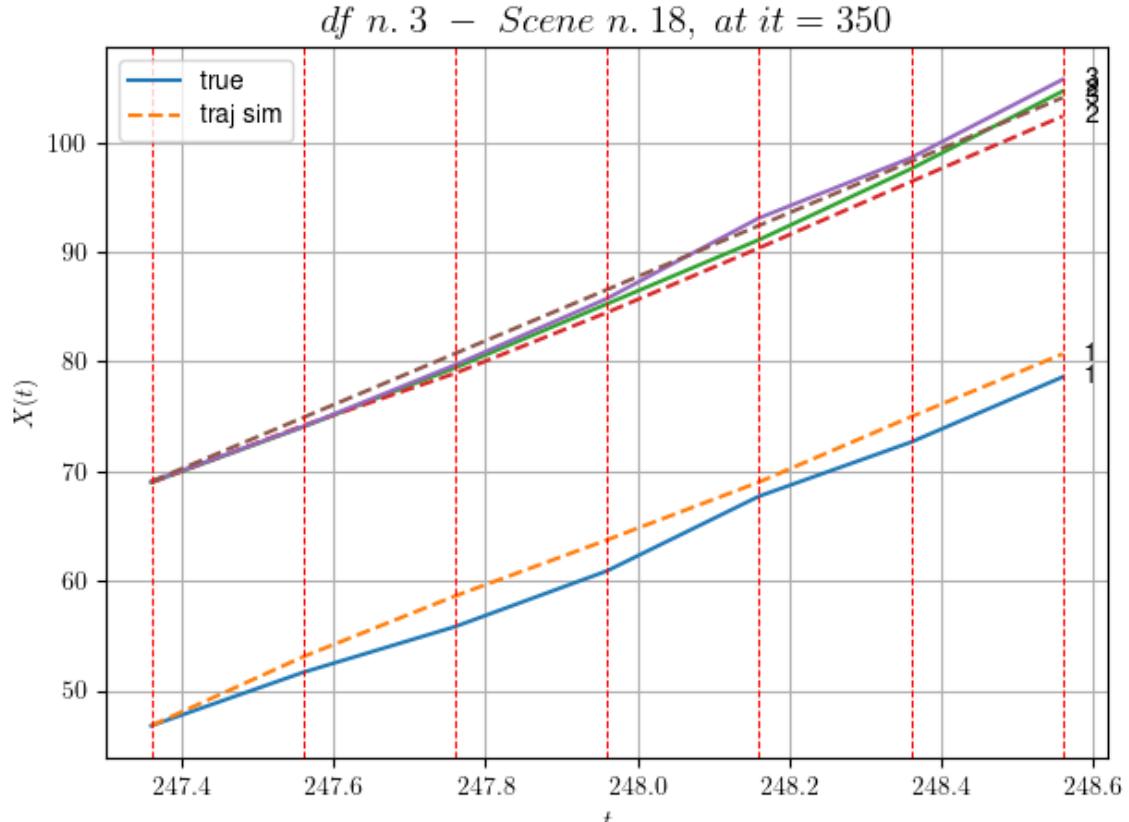
-----
- Time interval n.2: [247.76, 247.96]
  * y_true: [25.44173909 29.15378269]
  * v_ann: [25.571245193481445, 27.73728370666504, 2
9.199550876740744]

-----
- Time interval n.3: [247.96, 248.16]
  * y_true: [34.05263307 29.24437105]
  * v_ann: [26.37929916381836, 29.409217834472656, 2
9.199550876740744]

-----
- Time interval n.4: [248.16, 248.36]
  * y_true: [24.6823336 32.34552948]
  * v_ann: [29.775714874267578, 30.270898818969727, 2
9.199550876740744]

-----
- Time interval n.5: [248.36, 248.56]
  * y_true: [29.77329807 35.48696999]
  * v_ann: [28.71409034729004, 29.95663833618164, 29.
199550876740744]

=====
* err= 2.049731945395782
* Learning rate NN = 0.00031381050939671695
* diff = 0.0018481535245147285
```



For scene 18/55

- \* use LR\_NN=0.001 with err=39.269767431509145 at it=19
- \* v0\_scn\_mean = 29.26815499825632
- \* MAE = 1.7039908509241066

---



---

- Time interval n.0: [269.56, 269.76]
  - \* y\_true: [27.75027124 32.18076388]
  - \* v\_ann: [29.538272857666016, 29.39051628112793, 3 0.539171773719648]

---



---

- Time interval n.1: [269.76, 269.96]
  - \* y\_true: [33.80053503 32.77104018]
  - \* v\_ann: [29.545255661010742, 29.457294464111328, 3 0.539171773719648]

---



---

- Time interval n.2: [269.96, 270.16]
  - \* y\_true: [22.10049768 29.95131945]
  - \* v\_ann: [29.748214721679688, 29.686376571655273, 3 0.539171773719648]

---



---

- Time interval n.3: [270.16, 270.36]
  - \* y\_true: [32.40098084 29.70158012]
  - \* v\_ann: [29.518775939941406, 29.43975067138672, 3

0.539171773719648]

---

- Time interval n.4: [270.36, 270.56]
  - \* y\_true: [29.55119411 25.63174114]
  - \* v\_ann: [29.6208553314209, 29.5262393951416, 30.53

9171773719648]

---

- Time interval n.5: [270.56, 270.76]
  - \* y\_true: [29.3015063 30.75243246]
  - \* v\_ann: [29.523473739624023, 29.381433486938477, 3

0.539171773719648]

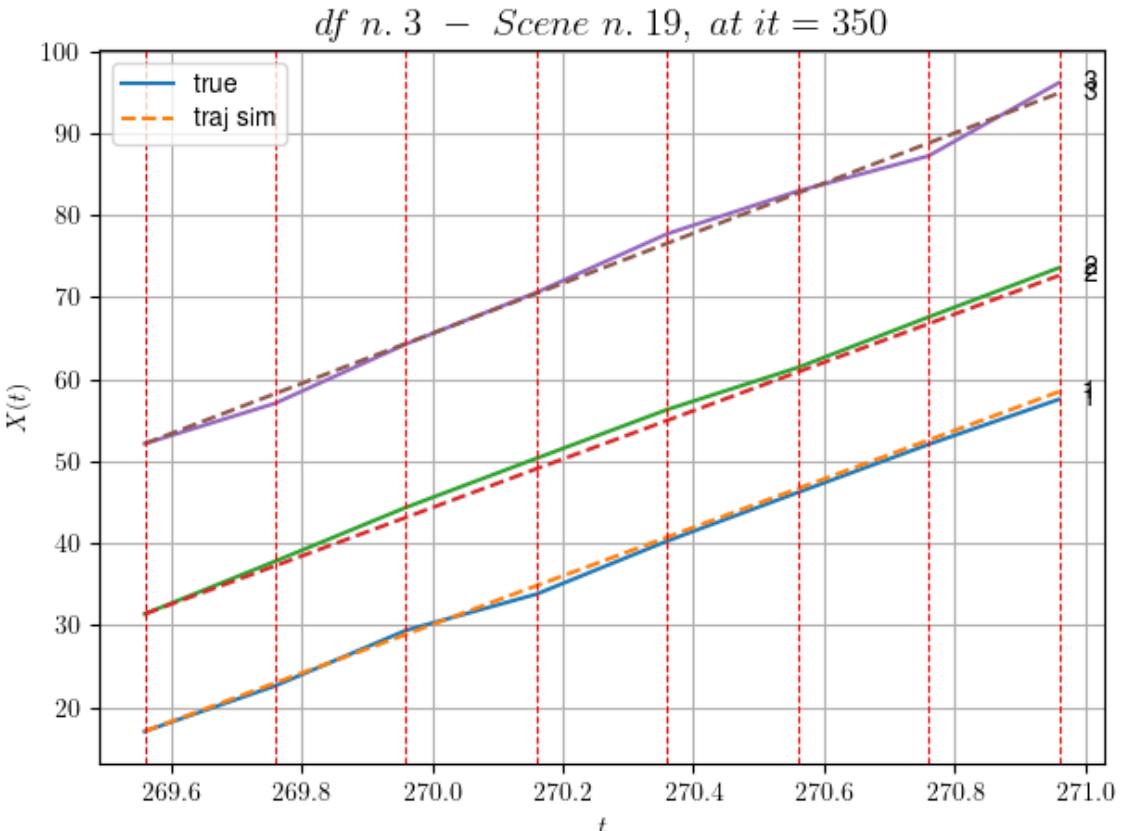
---

- Time interval n.6: [270.76, 270.96]
  - \* y\_true: [27.50174001 30.06304641]
  - \* v\_ann: [29.54958724975586, 29.462350845336914, 3

0.539171773719648]

---

- \* err= 0.7039159952959079
- \* Learning rate NN = 2.5418647055630572e-05
- \* diff = 0.00012773050250185464



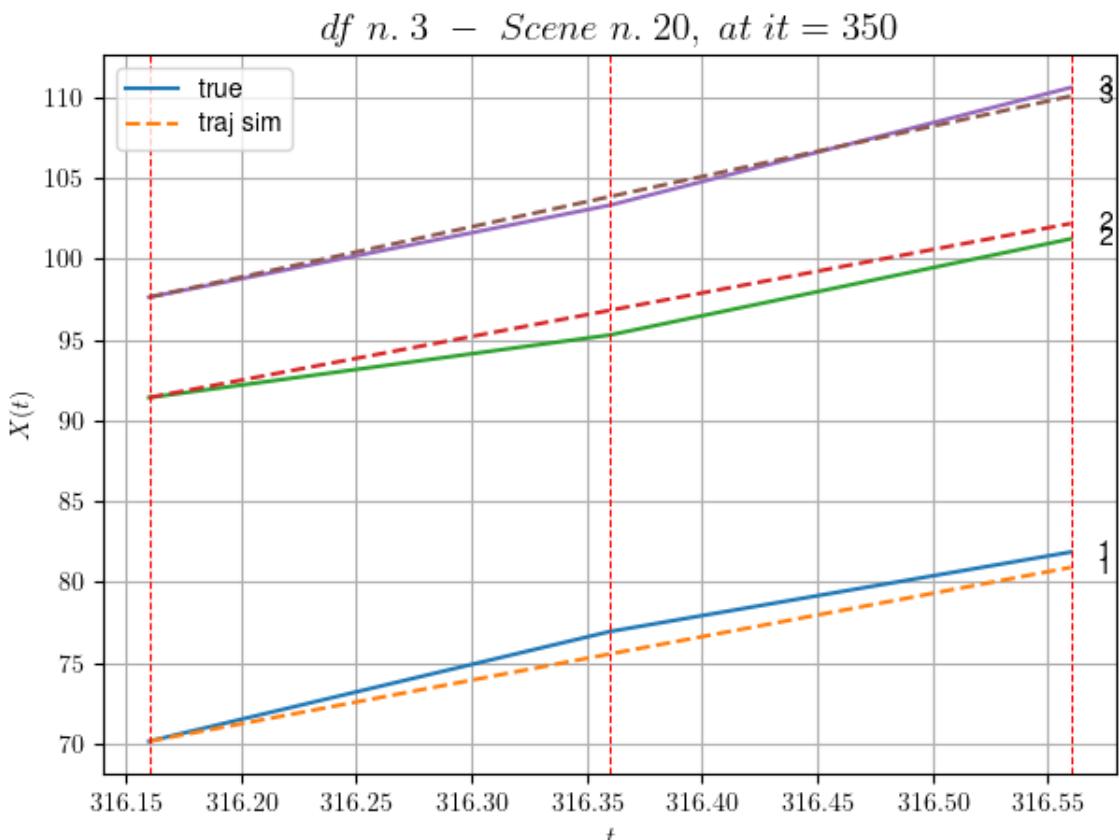
For scene 19/55

- \* use LR\_NN=0.0001 with err=6.1642492265177795 at it=19
- \* v0\_scn\_mean = 30.492960959306302
- \* MAE = 0.6995098452669009

```
=====
- Time interval n.0: [316.16, 316.36]
  * y_true: [33.9635286 19.3731464]
  * v_ann: [27.018341064453125, 27.014427185058594, 3
  1.119723216261207]
```

```
=====
- Time interval n.1: [316.36, 316.56]
  * y_true: [24.60296417 29.75560281]
  * v_ann: [26.790678024291992, 26.868989944458008, 3
  1.119723216261207]
```

```
=====
* err= 0.7371052996483436
* Learning rate NN = 0.00036449998151510954
* diff = 3.536138083348739e-06
```



For scene 20/55

```
* use LR_NN=0.0005 with err=3.4849789505980815 at it=19
* v0_scn_mean = 31.02375505868512
* MAE = 0.7366999364798952
```

```
=====
- Time interval n.0: [317.76, 317.96]
  * y_true: [22.24301013 28.10582296]
  * v_ann: [25.397043228149414, 24.536529541015625, 2
  8.729615682184367]
```

```

-----  

-----  

    - Time interval n.1: [317.96, 318.16]  

      * y_true: [28.26433817 33.10585656]  

      * v_ann: [26.008934020996094, 24.138561248779297, 2  

8.729615682184367]  

-----  

-----  

    - Time interval n.2: [318.16, 318.36]  

      * y_true: [11.28182915 18.67354228]  

      * v_ann: [27.582420349121094, 24.816797256469727, 2  

8.729615682184367]  

-----  

-----  

    - Time interval n.3: [318.36, 318.56]  

      * y_true: [28.12514655 32.86712293]  

      * v_ann: [25.960689544677734, 24.222932815551758, 2  

8.729615682184367]  

-----  

-----  

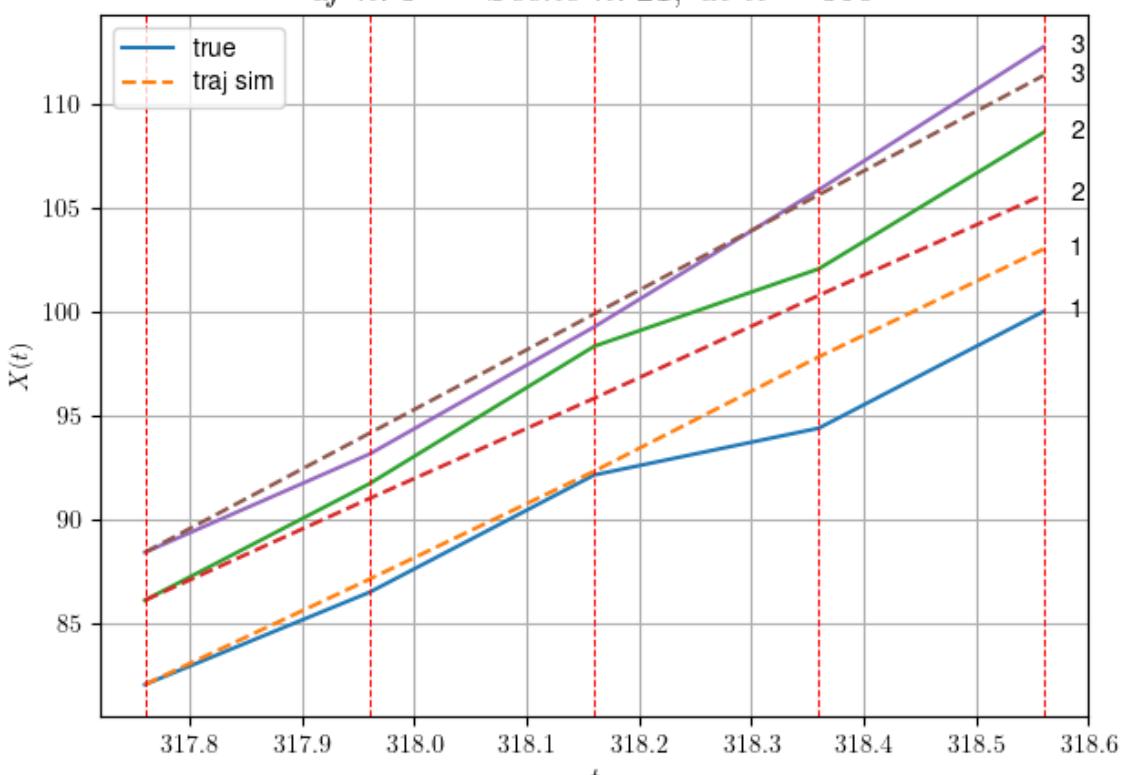
      * err= 2.809743473731871  

      * Learning rate NN = 0.000239148415857926  

      * diff = 0.0014472331341357503

```

*df n. 3 – Scene n. 21, at it = 350*



For scene 21/55

```

* use LR_NN=0.0005 with err=25.749061523574994 at it=19
* v0_scn_mean = 28.83849655615748
* MAE = 1.9957791313215925

```

```
- Time interval n.0: [325.76, 325.96]
  * y_true: [25.31057708 30.22149101]
  * v_ann: [26.927520751953125, 27.165328979492188, 3
3.135529650132085]

-----
- Time interval n.1: [325.96, 326.16]
  * y_true: [25.23074384 33.46208613]
  * v_ann: [26.966842651367188, 27.204519271850586, 3
3.135529650132085]

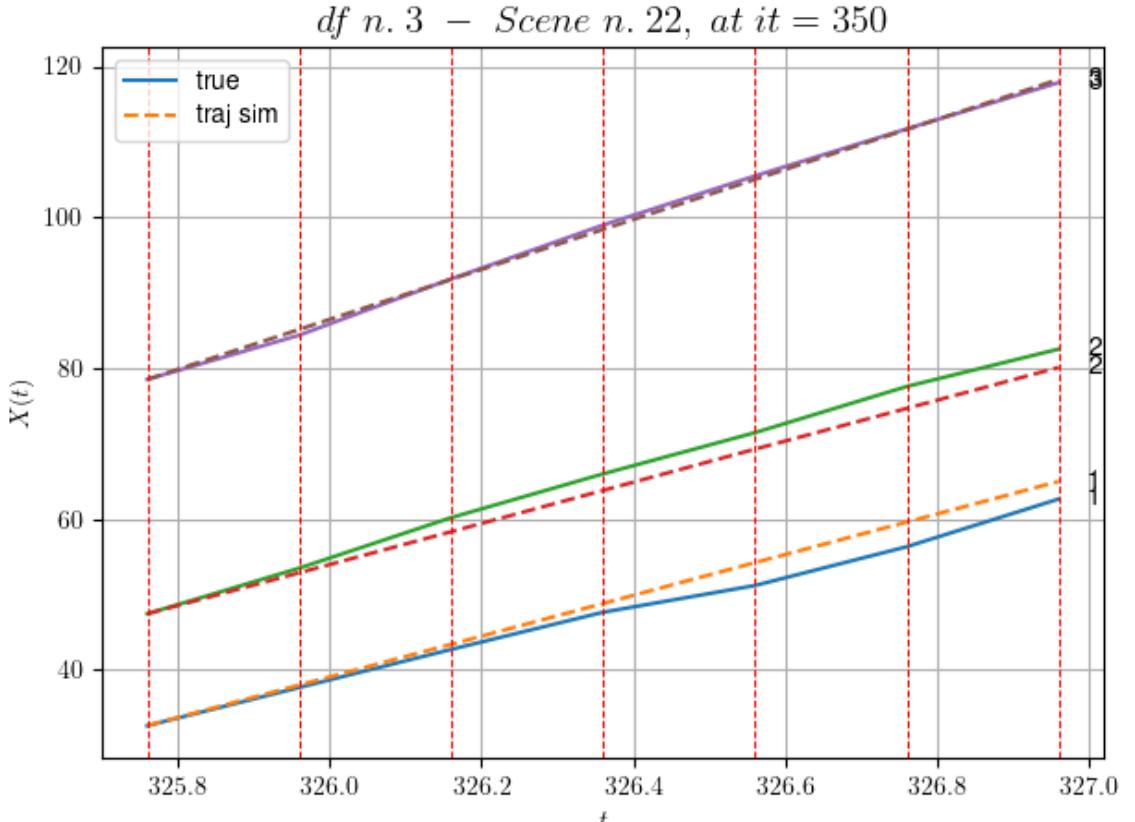
-----
- Time interval n.2: [326.16, 326.36]
  * y_true: [24.63092838 29.01218385]
  * v_ann: [27.080894470214844, 27.357929229736328, 3
3.135529650132085]

-----
- Time interval n.3: [326.36, 326.56]
  * y_true: [17.72077879 27.33248549]
  * v_ann: [27.079748153686523, 27.35430335998535, 3
3.135529650132085]

-----
- Time interval n.4: [326.56, 326.76]
  * y_true: [25.71142574 30.60327071]
  * v_ann: [26.891157150268555, 27.028553009033203, 3
3.135529650132085]

-----
- Time interval n.5: [326.76, 326.96]
  * y_true: [31.6120671 24.79299826]
  * v_ann: [26.961830139160156, 27.12044334411621, 3
3.135529650132085]

-----
* err= 2.6849575131366286
* Learning rate NN = 1.5690524378442205e-05
* diff = 0.009984433100667545
```



For scene 22/55

\* use LR\_NN=5e-05 with err=11.63437044723014 at it=19

\* v0\_scn\_mean = 32.86679269873433

\* MAE = 1.3607276389244969

---



---

- Time interval n.0: [335.76, 335.96]  
 \* y\_true: [36.00253797 32.17585284]  
 \* v\_ann: [42.132686614990234, 36.56119155883789, 9.  
 495828685169807]

---



---



---

- Time interval n.1: [335.96, 336.16]  
 \* y\_true: [33.90297107 37.71766361]  
 \* v\_ann: [27.635351181030273, 29.75760841369629, 9.  
 495828685169807]

---

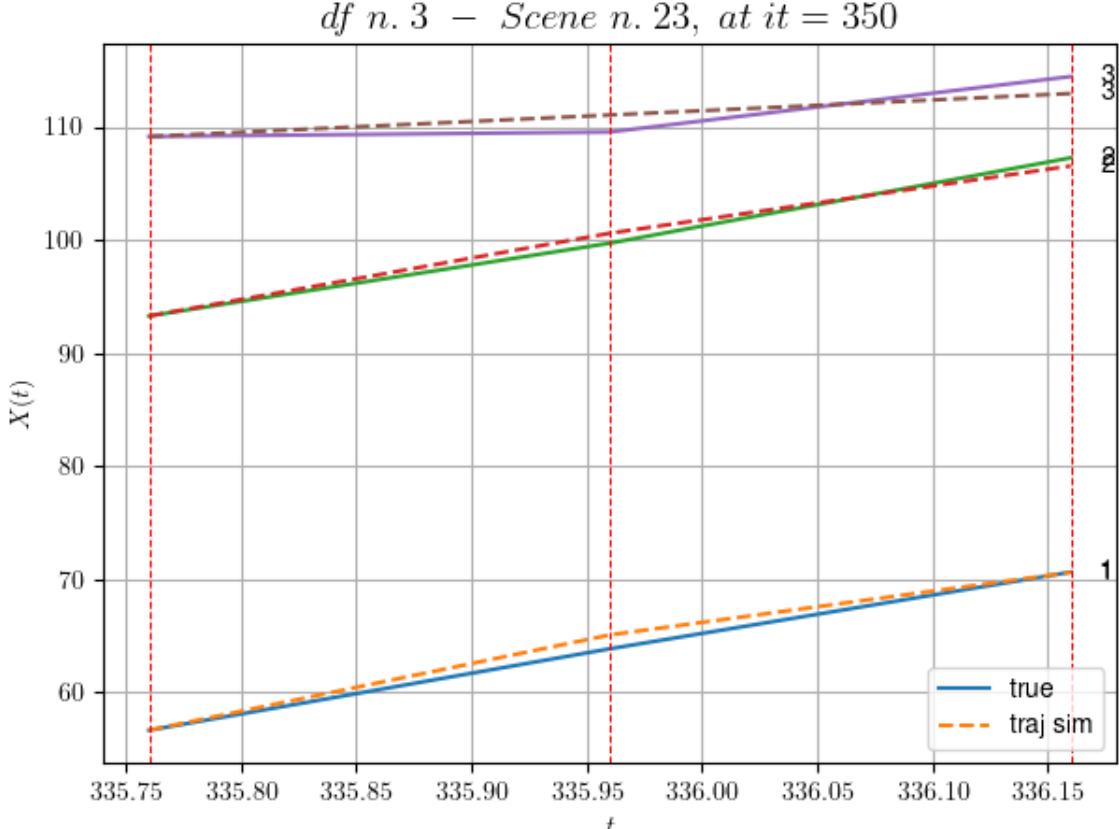


---



---

\* err= 0.8100490762890301  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.0016144219678556615



For scene 23/55

\* use LR\_NN=0.0005 with err=16.936925257089374 at it=19  
 \* v0\_scn\_mean = 11.25318042632105  
 \* MAE = 0.7625047435007977

---



---

- Time interval n.0: [371.16, 371.36]  
 \* y\_true: [24.42036896 26.80112378]  
 \* v\_ann: [27.099184036254883, 27.155662536621094, 3  
 2.53948924917097]

---

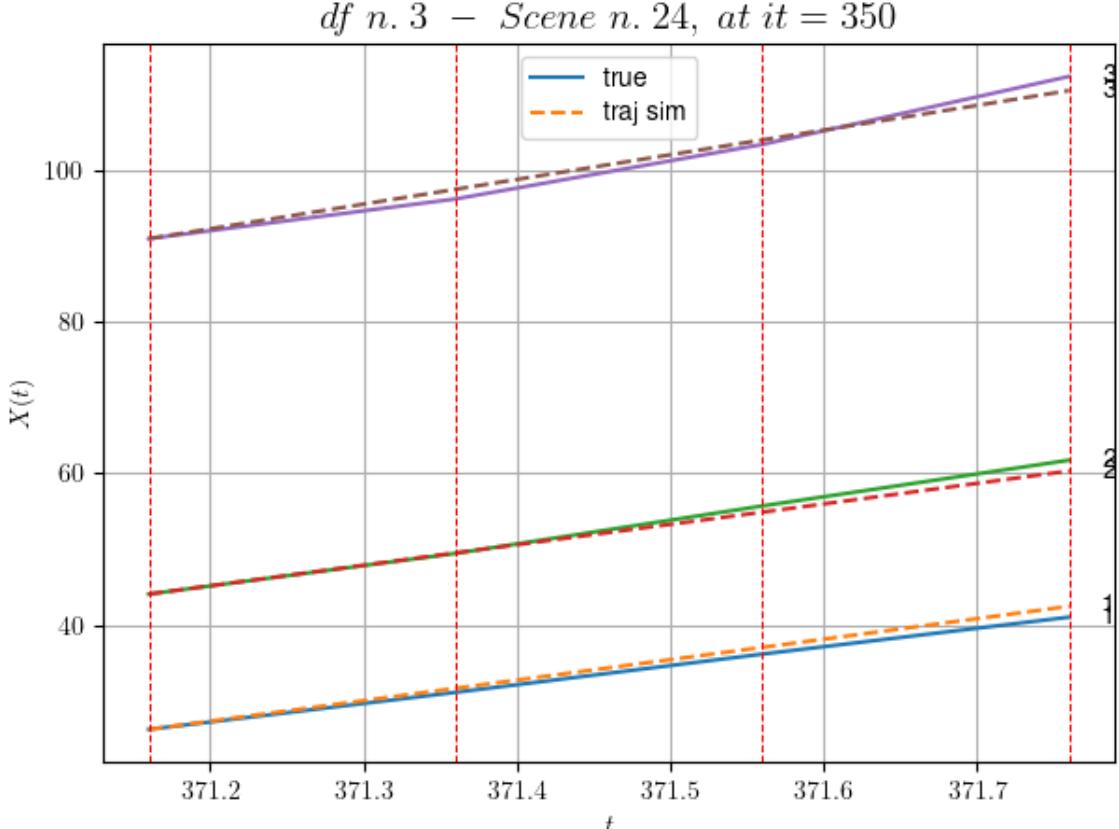
- Time interval n.1: [371.36, 371.56]  
 \* y\_true: [25.21053633 31.30165898]  
 \* v\_ann: [26.958223342895508, 26.843414306640625, 3  
 2.53948924917097]

---

- Time interval n.2: [371.56, 371.76]  
 \* y\_true: [24.36067127 30.15199262]  
 \* v\_ann: [27.087890625, 27.126861572265625, 32.5394  
 8924917097]

---

\* err= 0.94006648418727  
 \* Learning rate NN = 2.952449540316593e-05  
 \* diff = 0.0007088579084866264



For scene 24/55

\* use LR\_NN=5e-05 with err=8.588577130367655 at it=19  
 \* v0\_scn\_mean = 32.32183715364606  
 \* MAE = 0.94006648418727

- 
- 
- Time interval n.0: [387.36, 387.56]
    - \* y\_true: [32.47194771 39.46360823]
    - \* v\_ann: [28.343311309814453, 29.079008102416992, 3
    - 3.031876180270814]

---

  - Time interval n.1: [387.56, 387.76]
    - \* y\_true: [28.80212467 26.65295039]
    - \* v\_ann: [31.96422004699707, 34.20478820800781, 33.
    - 031876180270814]

---

  - Time interval n.2: [387.76, 387.96]
    - \* y\_true: [28.30253286 24.25305315]
    - \* v\_ann: [29.041154861450195, 30.176118850708008, 3
    - 3.031876180270814]

---

  - Time interval n.3: [387.96, 388.16]
    - \* y\_true: [34.31356051 24.78356316]
    - \* v\_ann: [27.359846115112305, 27.38465118408203, 3

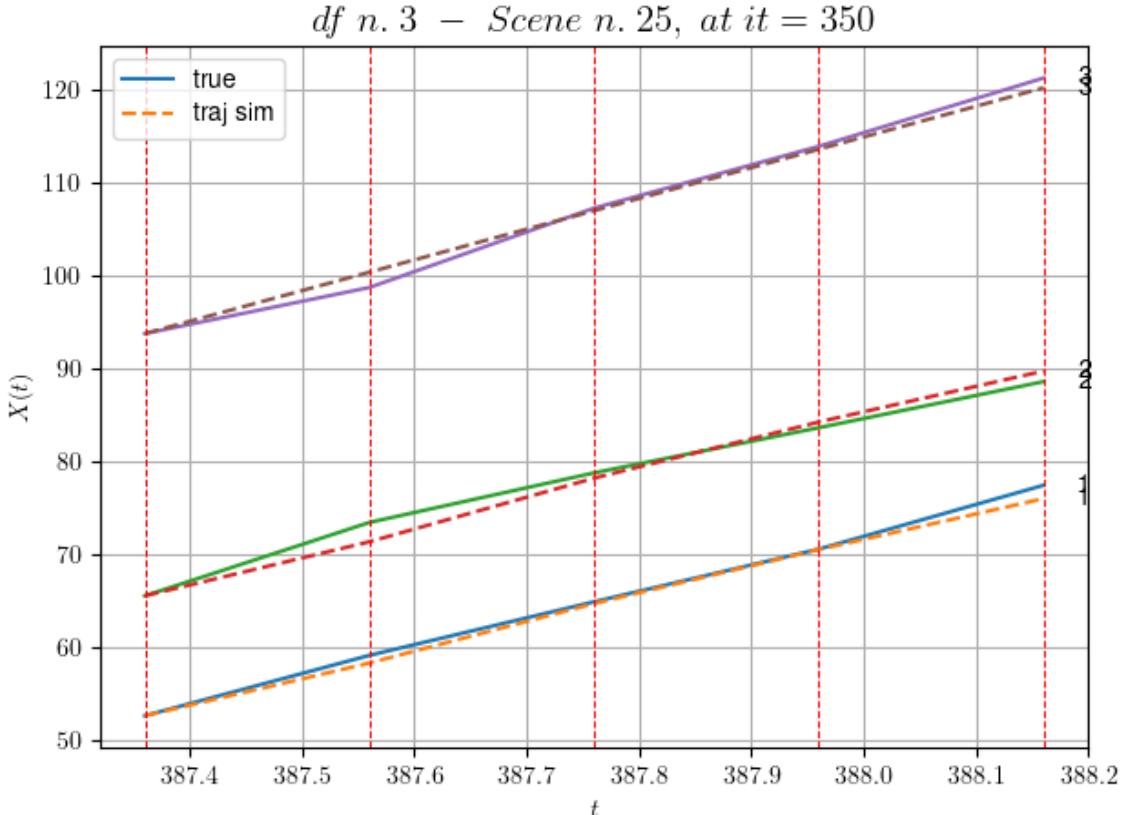
3.031876180270814]

---



---

- \* err= 0.8723732009041948
- \* Learning rate NN = 0.000239148415857926
- \* diff = 0.0013979206317322745



For scene 25/55

- \* use LR\_NN=0.0005 with err=17.2431599934914 at it=19
- \* v0\_scn\_mean = 32.772023060505326
- \* MAE = 0.8723732009041948

---



---

- Time interval n.0: [390.36, 390.56]
  - \* y\_true: [34.37306474 33.21473815]
  - \* v\_ann: [32.14795684814453, 31.941102981567383, 3

6.35421452147191]

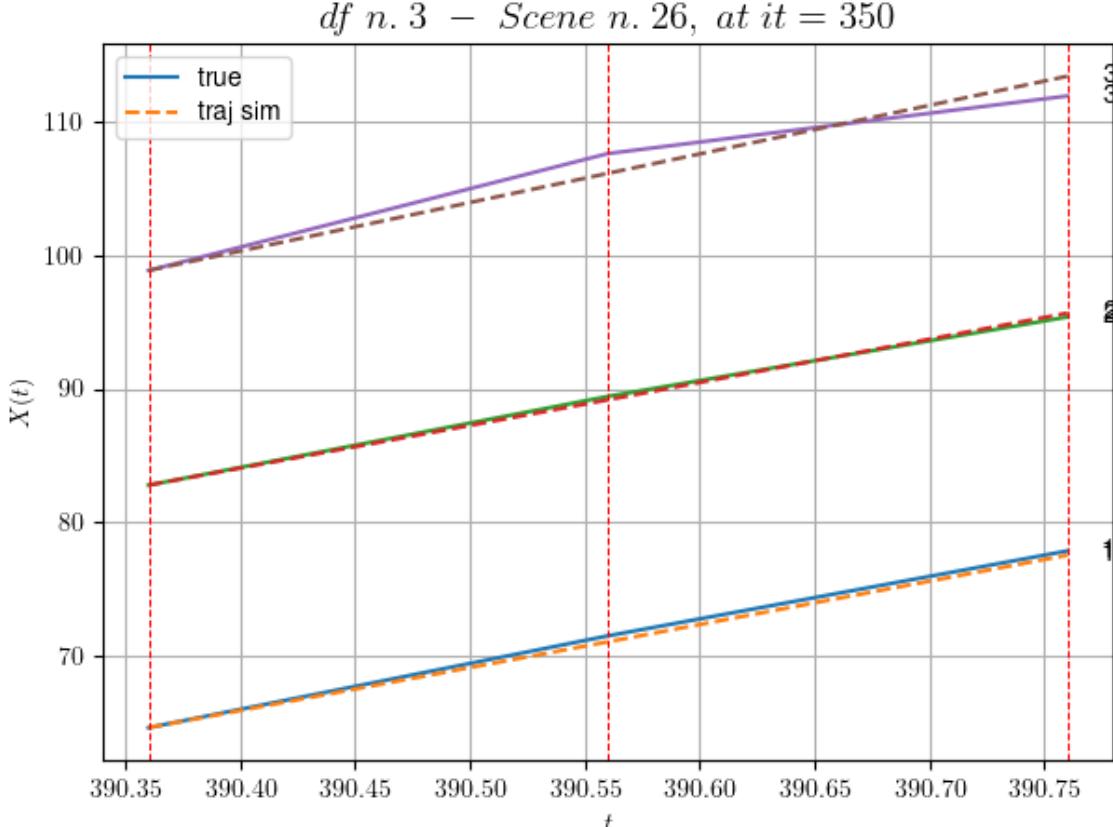
---

- Time interval n.1: [390.56, 390.76]
  - \* y\_true: [31.79338609 29.7348149 ]
  - \* v\_ann: [32.42655944824219, 32.45477294921875, 36.

35421452147191]

---

- \* err= 0.5358306981343771
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 3.247915773862964e-05



For scene 26/55

```
* use LR_NN=0.0001 with err=35.904940197238794 at it=19
* v0_scn_mean = 35.809613631169675
* MAE = 0.4882711157141779
```

---



---

```
- Time interval n.0: [427.96, 428.16]
* y_true: [33.16108667 24.70091575]
* v_ann: [32.073429107666016, 32.17848587036133, 3
7.34980306665235]
```

---

```
- Time interval n.1: [428.16, 428.36]
* y_true: [36.08159054 35.68166414]
* v_ann: [31.998931884765625, 31.46647071838379, 3
7.34980306665235]
```

---

```
- Time interval n.2: [428.36, 428.56]
* y_true: [27.64533545 36.4184567 ]
* v_ann: [32.090850830078125, 32.45298767089844, 3
7.34980306665235]
```

---

```
- Time interval n.3: [428.56, 428.76]
* y_true: [24.96174823 38.17283814]
* v_ann: [32.09394454956055, 32.36446762084961, 37.
```

34980306665235]

```

-----  

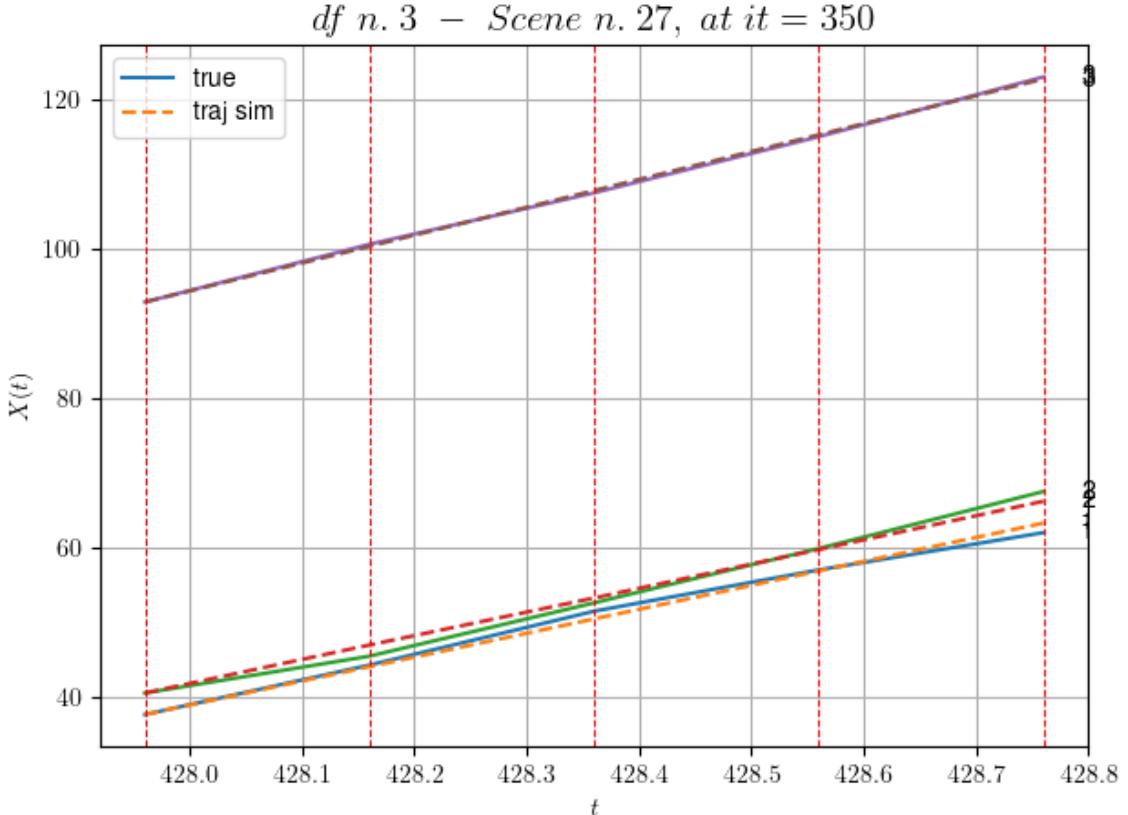
-----  

* err= 0.4988236928801589  

* Learning rate NN = 2.3914839403005317e-05  

* diff = 2.5664195100250087e-05

```



For scene 27/55

```

* use LR_NN=5e-05 with err=74.07516332185959 at it=19
* v0_scn_mean = 36.71987323345084
* MAE = 0.4911453693457519

```

---



---



---

- Time interval n.0: [439.36, 439.56]  
\* y\_true: [29.12388438 22.06331107]  
\* v\_ann: [25.28569984436035, 25.28070068359375, 33.  
53635301945251]

---



---



---

- Time interval n.1: [439.56, 439.76]  
\* y\_true: [38.07606081 22.99369197]  
\* v\_ann: [25.297849655151367, 25.503671646118164, 3  
3.53635301945251]

---



---



---

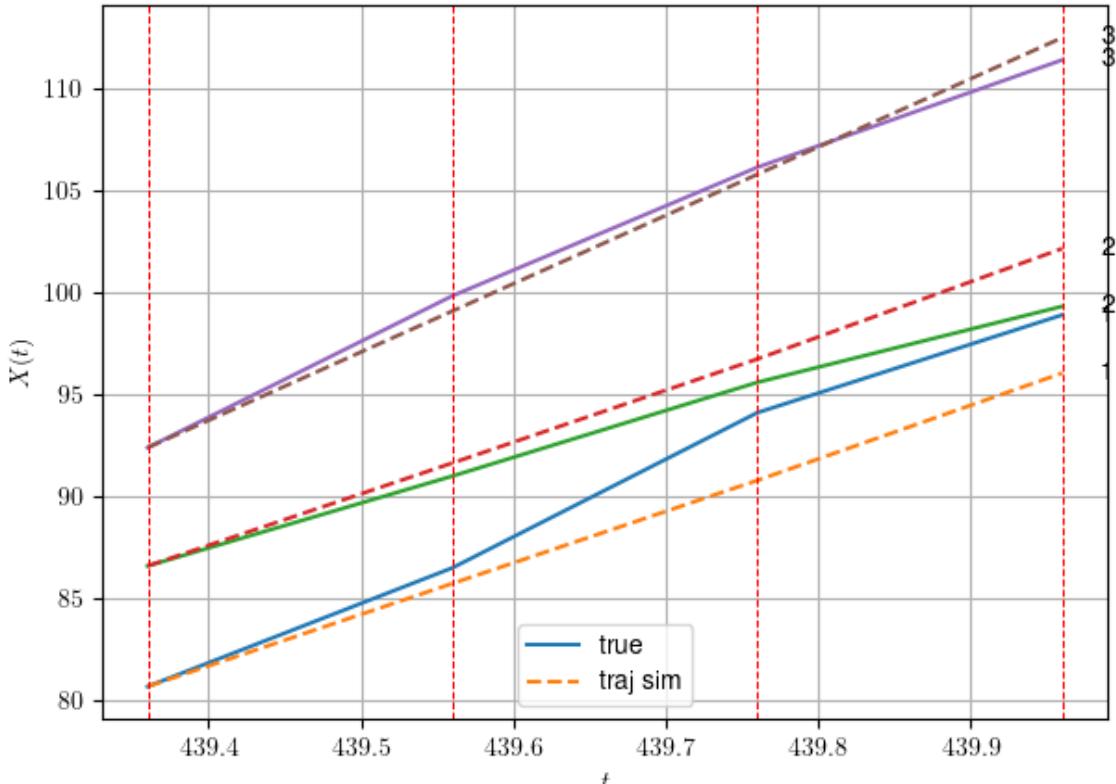
- Time interval n.2: [439.76, 439.96]  
\* y\_true: [23.98424021 18.65338098]  
\* v\_ann: [26.32842445373535, 27.108291625976562, 3  
3.53635301945251]

```

* err= 2.6184861926323566
* Learning rate NN = 0.0002952449722215533
* diff = 0.0010985309698714474

```

*df n. 3 – Scene n. 28, at it = 350*



For scene 28/55

```

* use LR_NN=0.0005 with err=13.439517722104625 at it=19
* v0_scn_mean = 33.233262685264364
* MAE = 2.536800847068544

```

---



---

- Time interval n.0: [448.36, 448.56]
  - \* y\_true: [32.70350359 27.85524745]
  - \* v\_ann: [32.942081451416016, 31.968551635742188, 31.585036733084028]

---



---

- Time interval n.1: [448.56, 448.76]
  - \* y\_true: [39.76511656 28.75604876]
  - \* v\_ann: [32.265506744384766, 31.68000030517578, 31.585036733084028]

---

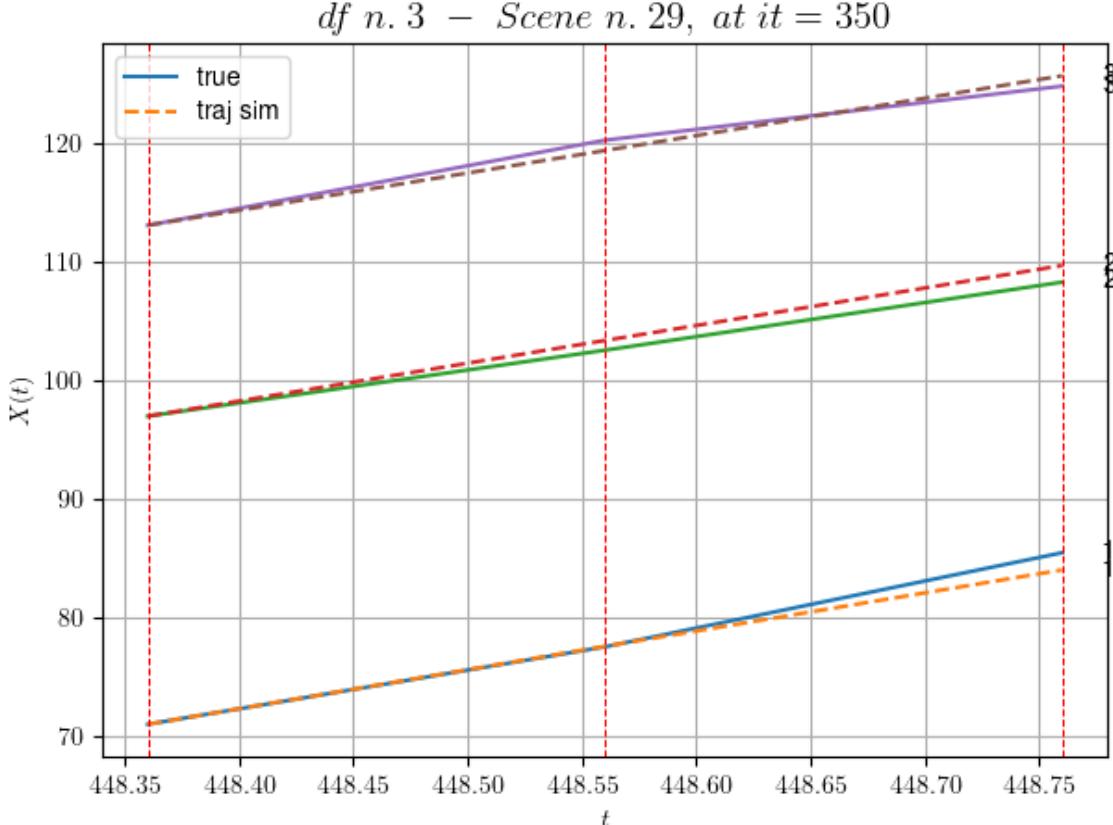


---

```

* err= 0.6999535971262197
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0023810507799355562

```



For scene 29/55

\* use LR\_NN=0.0001 with err=0.6180741663290968 at it=19  
 \* v0\_scn\_mean = 31.449187933349577  
 \* MAE = 0.5144327322019285

---



---

- Time interval n.0: [465.16, 465.36]  
 \* y\_true: [25.95020905 30.0319773 ]  
 \* v\_ann: [26.452707290649414, 26.464176177978516, 2  
 4.72211720249987]

---

- Time interval n.1: [465.36, 465.56]  
 \* y\_true: [21.30025919 28.782318 ]  
 \* v\_ann: [26.64558219909668, 26.567989349365234, 2  
 4.72211720249987]

---

- Time interval n.2: [465.56, 465.76]  
 \* y\_true: [22.00036741 28.59272475]  
 \* v\_ann: [26.444576263427734, 26.46048927307129, 2  
 4.72211720249987]

---

- Time interval n.3: [465.76, 465.96]  
 \* y\_true: [26.90061063 23.70259195]  
 \* v\_ann: [26.283405303955078, 26.383394241333008, 2

4.72211720249987]

```
- Time interval n.4: [465.96, 466.16]
  * y_true: [23.75070885 23.26288454]
  * v_ann: [26.14778709411621, 26.32817840576172, 24.
```

72211720249987]

```
- Time interval n.5: [466.16, 466.36]
  * y_true: [28.05107156 31.61450449]
  * v_ann: [25.796642303466797, 26.186363220214844, 2
```

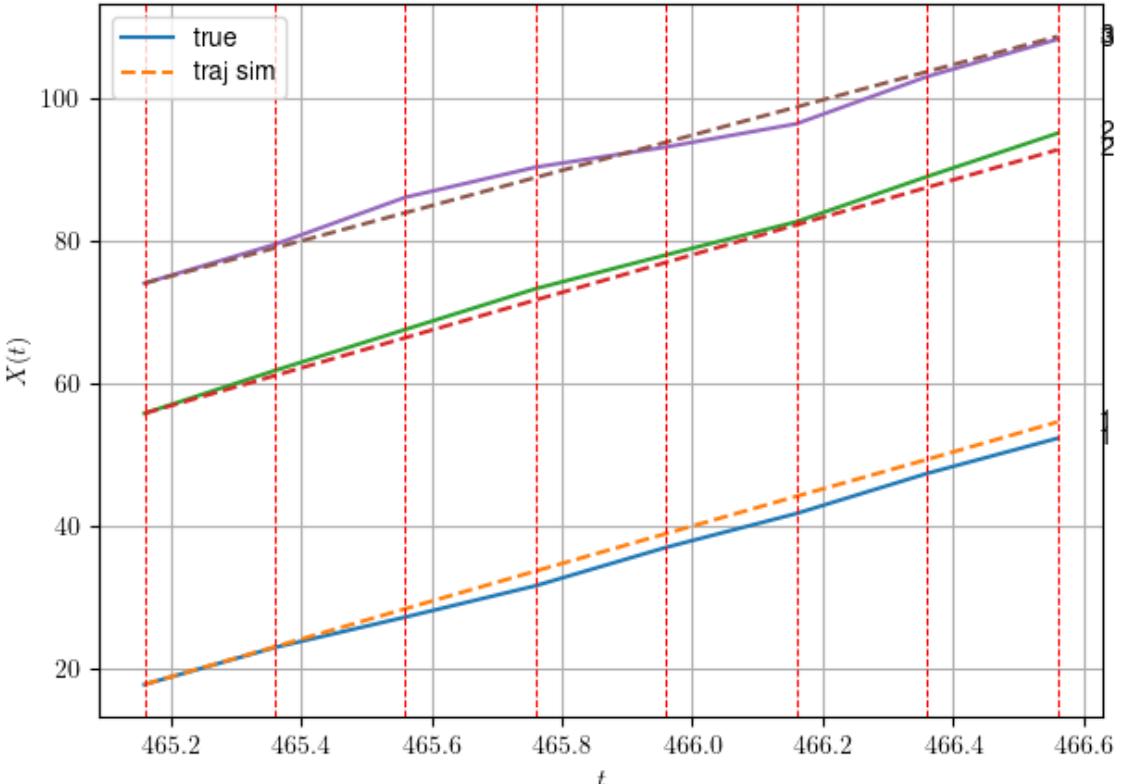
4.72211720249987]

```
- Time interval n.6: [466.36, 466.56]
  * y_true: [24.65117633 30.37492519]
  * v_ann: [26.29343605041504, 26.399518966674805, 2
```

4.72211720249987]

```
* err= 2.1342095358989126
* Learning rate NN = 2.5418647055630572e-05
* diff = 0 001054356973015036
```

df n. 3 – Scene n. 30, at it = 350



For scene 30/55

```
* use LR_NN=0.0001 with err=64.66371757784452 at it=19
* v0_scn_mean = 25.174468891400444
* MAE = 2.122576397324757
```

```
=====
- Time interval n.0: [467.16, 467.36]
  * y_true: [14.52040439 29.14139959]
  * v_ann: [19.264604568481445, 20.42564582824707, 2
0.77632950178191]

-----
- Time interval n.1: [467.36, 467.56]
  * y_true: [ 8.96028804 21.01119683]
  * v_ann: [19.641769409179688, 20.15561294555664, 2
0.77632950178191]

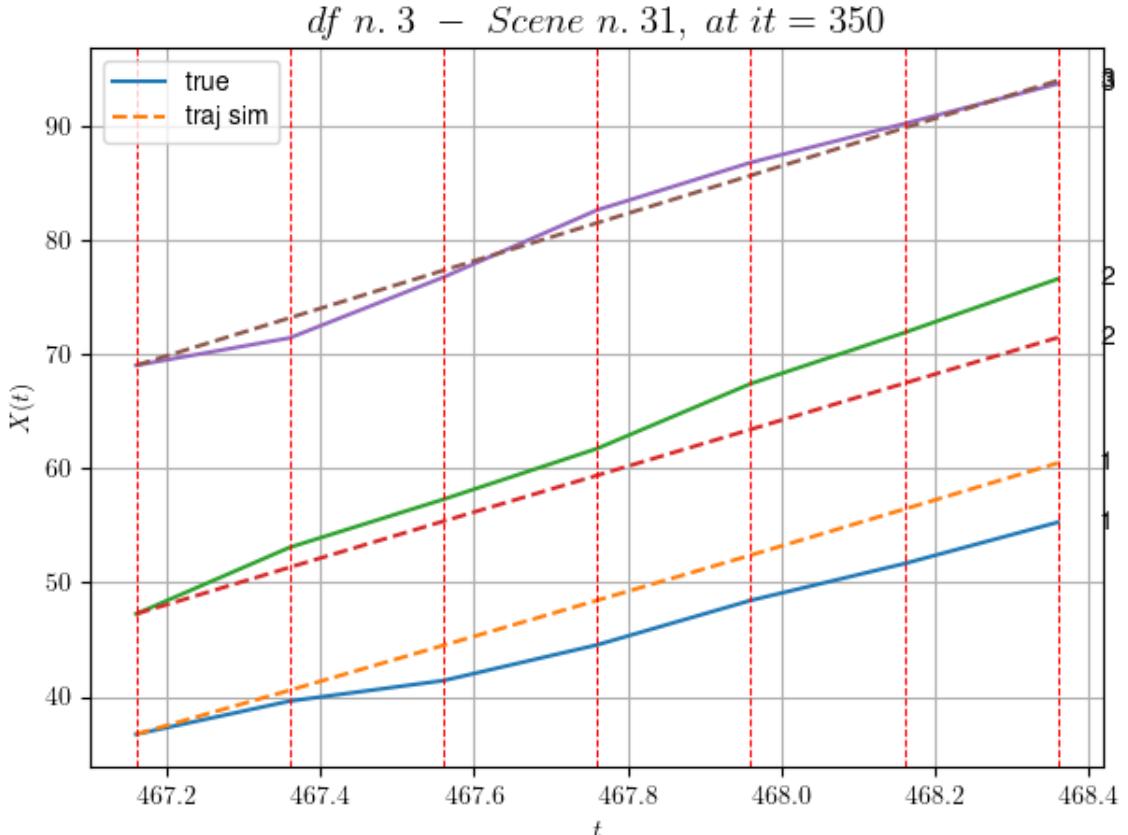
-----
- Time interval n.2: [467.56, 467.76]
  * y_true: [15.62056342 22.22157858]
  * v_ann: [19.690837860107422, 20.048931121826172, 2
0.77632950178191]

-----
- Time interval n.3: [467.76, 467.96]
  * y_true: [19.48080782 28.40220095]
  * v_ann: [19.78034210205078, 20.145992279052734, 2
0.77632950178191]

-----
- Time interval n.4: [467.96, 468.16]
  * y_true: [16.10078185 22.34213456]
  * v_ann: [20.148746490478516, 20.1892147064209, 20.
77632950178191]

-----
- Time interval n.5: [468.16, 468.36]
  * y_true: [18.12099432 23.56241547]
  * v_ann: [20.23066520690918, 20.03289222717285, 20.
77632950178191]

=====
* err= 8.162825530138855
* Learning rate NN = 3.138104875688441e-05
* diff = 0.0129843075166729
```



For scene 31/55

\* use LR\_NN=0.0001 with err=16.145627948963206 at it=19  
 \* v0\_scn\_mean = 21.56686295768006  
 \* MAE = 8.162825530138855

---



---

- Time interval n.0: [480.76, 480.96]  
 \* y\_true: [26.72145209 13.04113053]  
 \* v\_ann: [17.86609649658203, 18.330333709716797, 1  
 8.30492624469463]

---

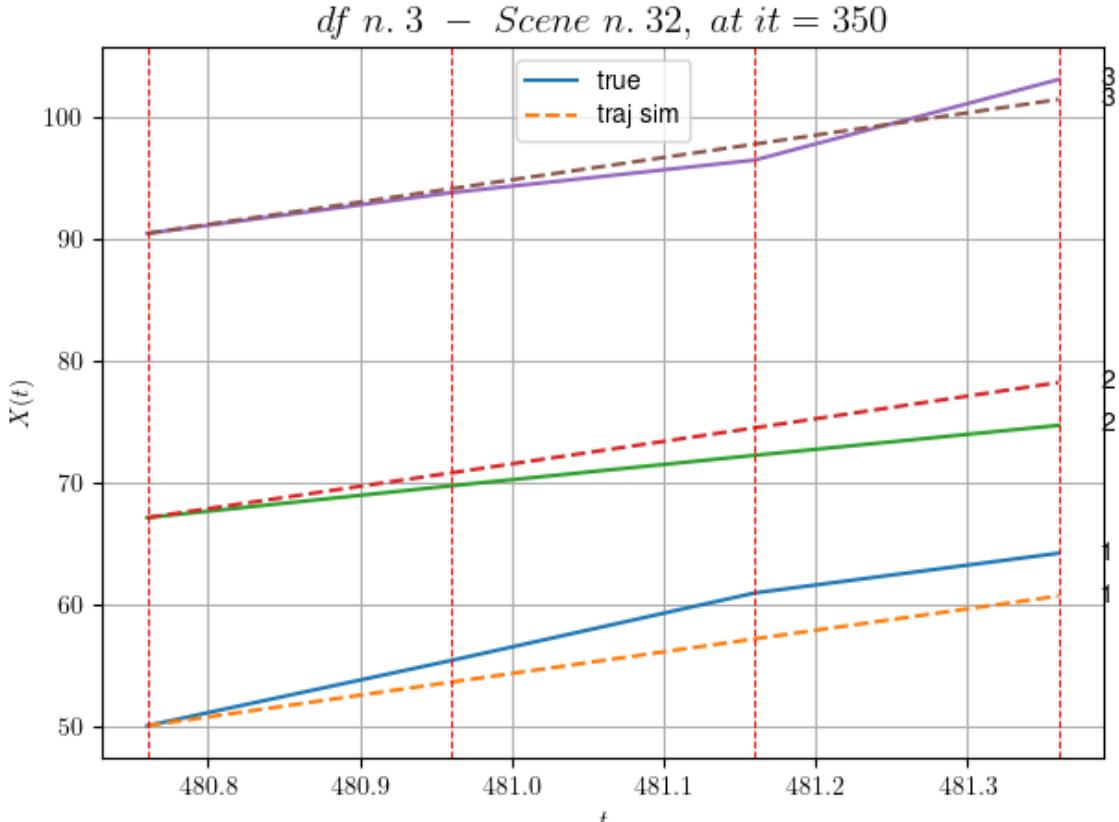
- Time interval n.1: [480.96, 481.16]  
 \* y\_true: [27.70182882 12.50117676]  
 \* v\_ann: [17.729413986206055, 18.468538284301758, 1  
 8.30492624469463]

---

- Time interval n.2: [481.16, 481.36]  
 \* y\_true: [16.26121495 12.26123448]  
 \* v\_ann: [17.56527328491211, 18.573802947998047, 1  
 8.30492624469463]

---

\* err= 4.385665139866017  
 \* Learning rate NN = 2.952449540316593e-05  
 \* diff = 0.001480915101850222



For scene 32/55

- \* use LR\_NN=5e-05 with err=15.376741328705089 at it=19
- \* v0\_scn\_mean = 19.30727634756958
- \* MAE = 4.290206517746608

---



---

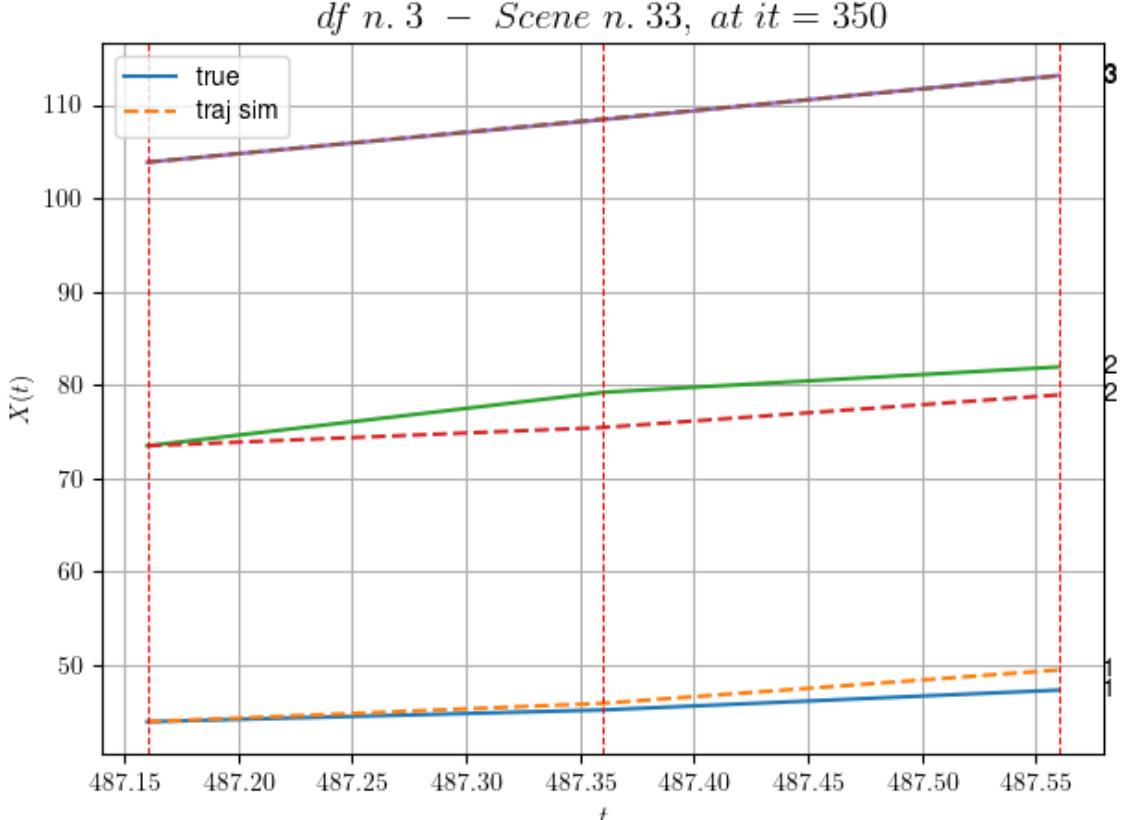
- Time interval n.0: [487.16, 487.36]
- \* y\_true: [ 6.3002445 28.62315801]
- \* v\_ann: [9.857588768005371, 9.811659812927246, 23.071881683467836]

---

- Time interval n.1: [487.36, 487.56]
- \* y\_true: [10.63044184 13.60161023]
- \* v\_ann: [17.852508544921875, 17.44837188720703, 23.071881683467836]

---

- \* err= 3.1416311439470204
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 5.716627699881016e-05



For scene 33/55

- \* use LR\_NN=0.001 with err=8.28628065176694 at it=19
- \* v0\_scn\_mean = 23.665670166773452
- \* MAE = 2.9310801125521895

---



---

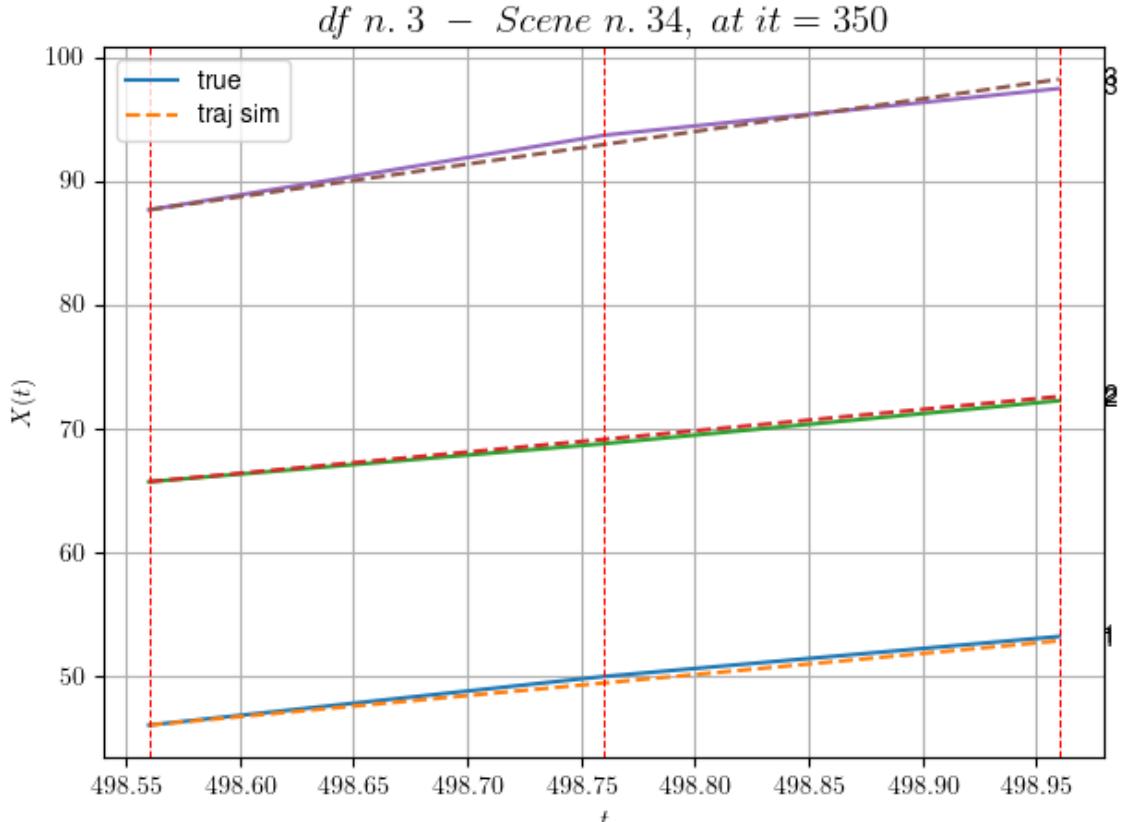
- Time interval n.0: [498.56, 498.76]
- \* y\_true: [19.66086018 15.38134444]
- \* v\_ann: [17.040180206298828, 17.14320945739746, 2  
6.404288947135246]

---

- Time interval n.1: [498.76, 498.96]
- \* y\_true: [16.17082592 17.38167269]
- \* v\_ann: [17.044939041137695, 17.32421875, 26.40428  
8947135246]

---

- \* err= 0.1958224404698108
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 7.80076391166673e-05



For scene 34/55

\* use LR\_NN=0.0001 with err=0.8225402262122365 at it=19

\* v0\_scn\_mean = 26.71246668240688

\* MAE = 0.1958224404698108

---



---

- Time interval n.0: [517.96, 518.16]  
 \* y\_true: [11.01062169 17.99135838]  
 \* v\_ann: [13.620274543762207, 13.482928276062012, 1  
 3.435858379543824]

---



---

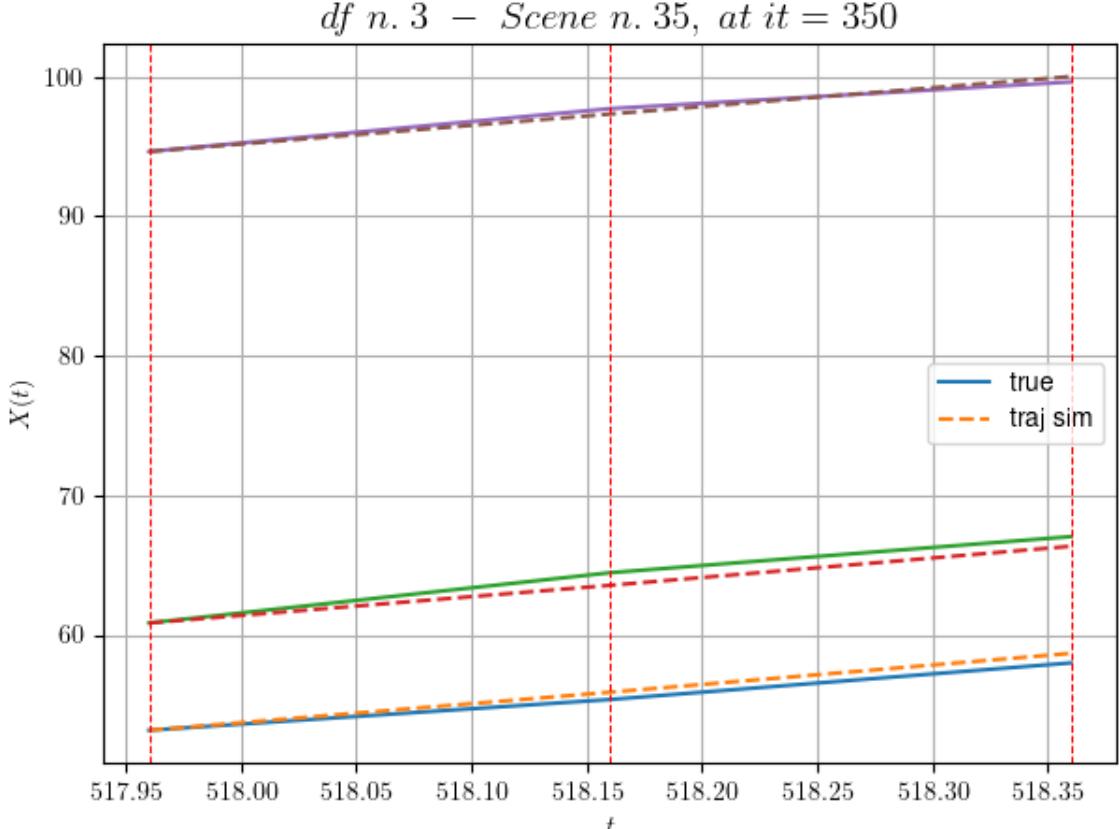
- Time interval n.1: [518.16, 518.36]  
 \* y\_true: [13.11081201 12.94110202]  
 \* v\_ann: [13.934783935546875, 13.992992401123047, 1  
 3.435858379543824]

---



---

\* err= 0.2594570143346288  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 9.975845006726658e-07



For scene 35/55

```
* use LR_NN=0.0005 with err=7.929108178473025 at it=19
* v0_scn_mean = 14.855521855352594
* MAE = 0.2594570143346288
```

---



---

- Time interval n.0: [527.36, 527.56]
  - \* y\_true: [14.45064103 23.0016556 ]
  - \* v\_ann: [17.0281925201416, 16.89641761779785, 16.921000530112345]
  
- Time interval n.1: [527.56, 527.76]
  - \* y\_true: [16.14079976 10.04077962]
  - \* v\_ann: [17.178569793701172, 17.402545928955078, 16.921000530112345]
  
- Time interval n.2: [527.76, 527.96]
  - \* y\_true: [12.25068777 19.3317022 ]
  - \* v\_ann: [16.423498153686523, 16.46876335144043, 16.921000530112345]
  
- Time interval n.3: [527.96, 528.16]
  - \* y\_true: [17.36107311 21.34208771]
  - \* v\_ann: [16.067873001098633, 16.30081558227539, 16.921000530112345]

6.921000530112345]

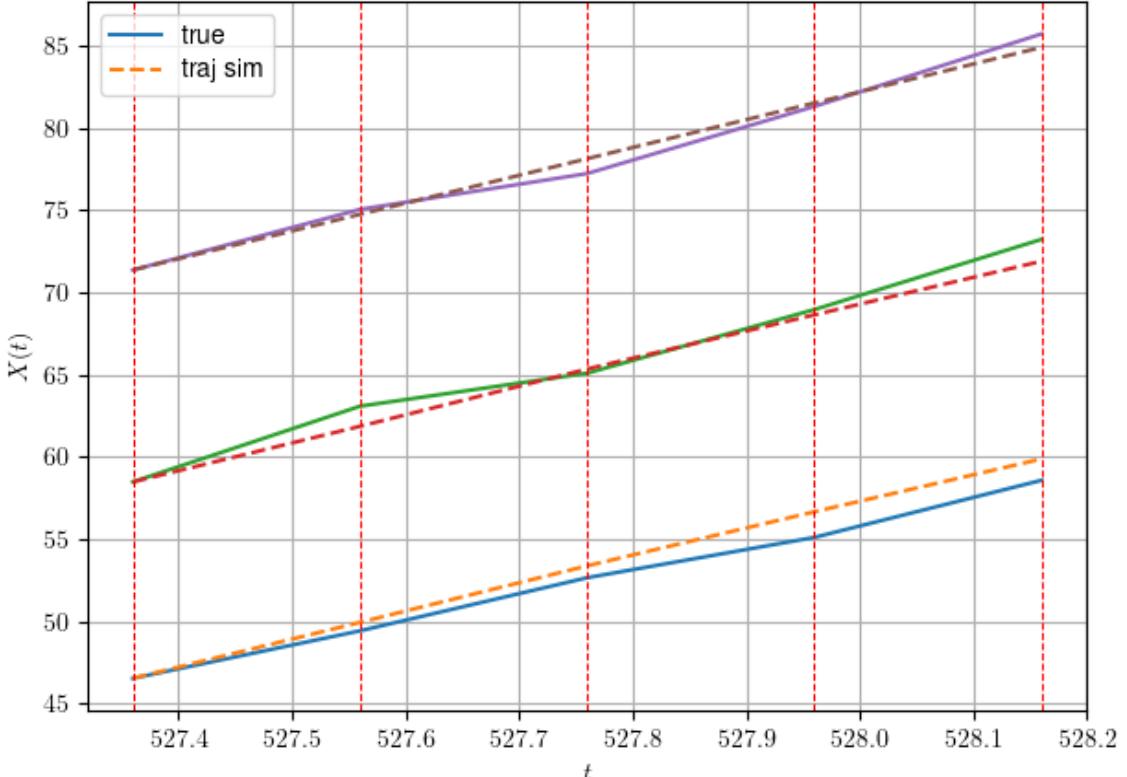
---



---

- \* err= 0.662856516278957
- \* Learning rate NN = 0.000239148415857926
- \* diff = 1.0302086583258152e-05

*df n. 3 – Scene n. 36, at it = 350*



For scene 36/55

- \* use LR\_NN=0.0005 with err=14.134166920997496 at it=19
- \* v0\_scn\_mean = 18.04196280349681
- \* MAE = 0.6628160640530504

---



---

- Time interval n.0: [530.36, 530.56]  
 \* y\_true: [16.07060164 26.13260896]  
 \* v\_ann: [19.66476058959961, 19.759748458862305, 1  
 8.05494146639506]

---

- Time interval n.1: [530.56, 530.76]  
 \* y\_true: [15.14064363 18.85215172]  
 \* v\_ann: [19.715038299560547, 19.85580825805664, 1  
 8.05494146639506]

---

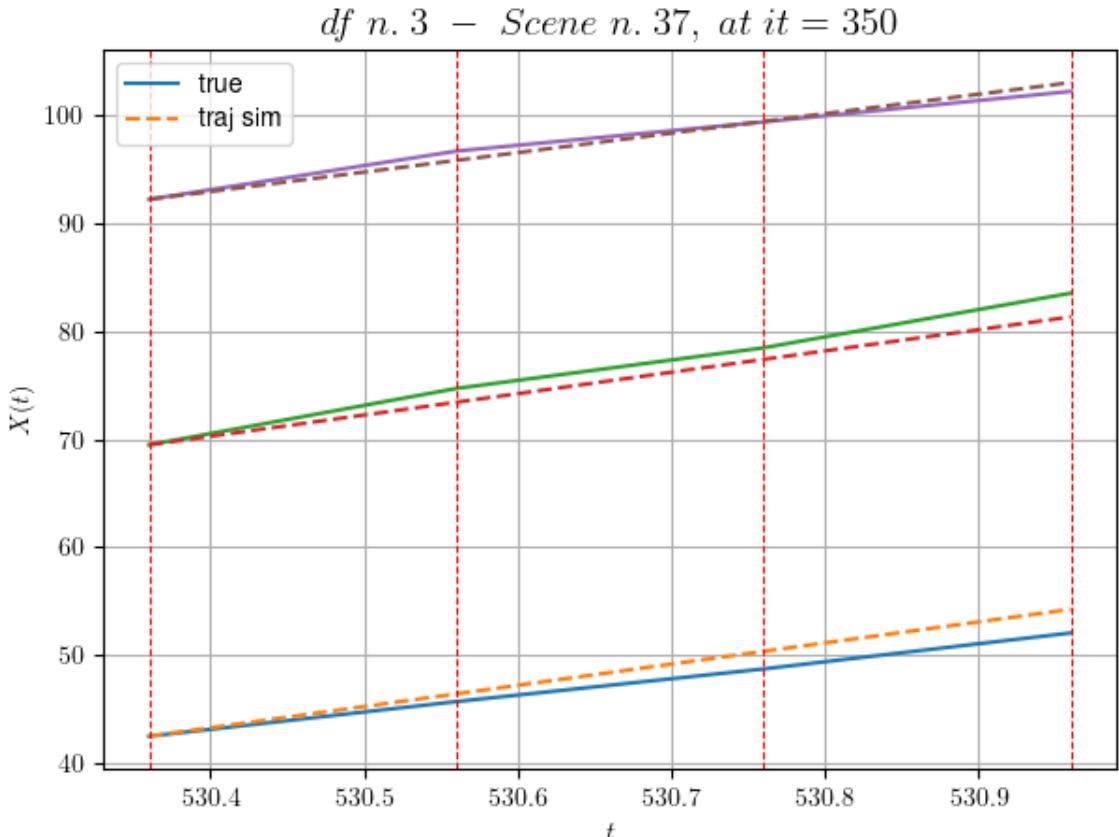
- Time interval n.2: [530.76, 530.96]  
 \* y\_true: [16.69081323 25.36324467]  
 \* v\_ann: [19.503013610839844, 19.7209529876709, 18.  
 05494146639506]

---

```

* err= 1.4210073075481304
* Learning rate NN = 2.952449540316593e-05
* diff = 4.810591824622179e-05

```



For scene 37/55

```

* use LR_NN=5e-05 with err=10.971107420404898 at it=19
* v0_scn_mean = 19.078717023566924
* MAE = 1.4210073075481304

```

- 
- 
- Time interval n.0: [576.56, 576.76]
    - \* y\_true: [22.12000755 22.50086521]
    - \* v\_ann: [21.871915817260742, 21.723949432373047, 21.51674944574841]
- 
- 
- Time interval n.1: [576.76, 576.96]
    - \* y\_true: [22.90003133 17.69083 ]
    - \* v\_ann: [22.20016860961914, 21.960506439208984, 21.51674944574841]
- 
- 
- Time interval n.2: [576.96, 577.16]
    - \* y\_true: [24.57008129 24.8113942 ]
    - \* v\_ann: [21.000293731689453, 21.14042091369629, 21.51674944574841]

```

-----  

- Time interval n.3: [577.16, 577.36]  

* y_true: [26.44016601 28.10183764]  

* v_ann: [23.30393409729004, 22.670948028564453, 2  

1.51674944574841]
-----
```

```

-----  

- Time interval n.4: [577.36, 577.56]  

* y_true: [27.01028631 17.73134123]  

* v_ann: [26.155933380126953, 24.38774299621582, 2  

1.51674944574841]
-----
```

```

-----  

- Time interval n.5: [577.56, 577.76]  

* y_true: [28.59045436 12.12102827]  

* v_ann: [23.916873931884766, 23.18042755126953, 2  

1.51674944574841]
-----
```

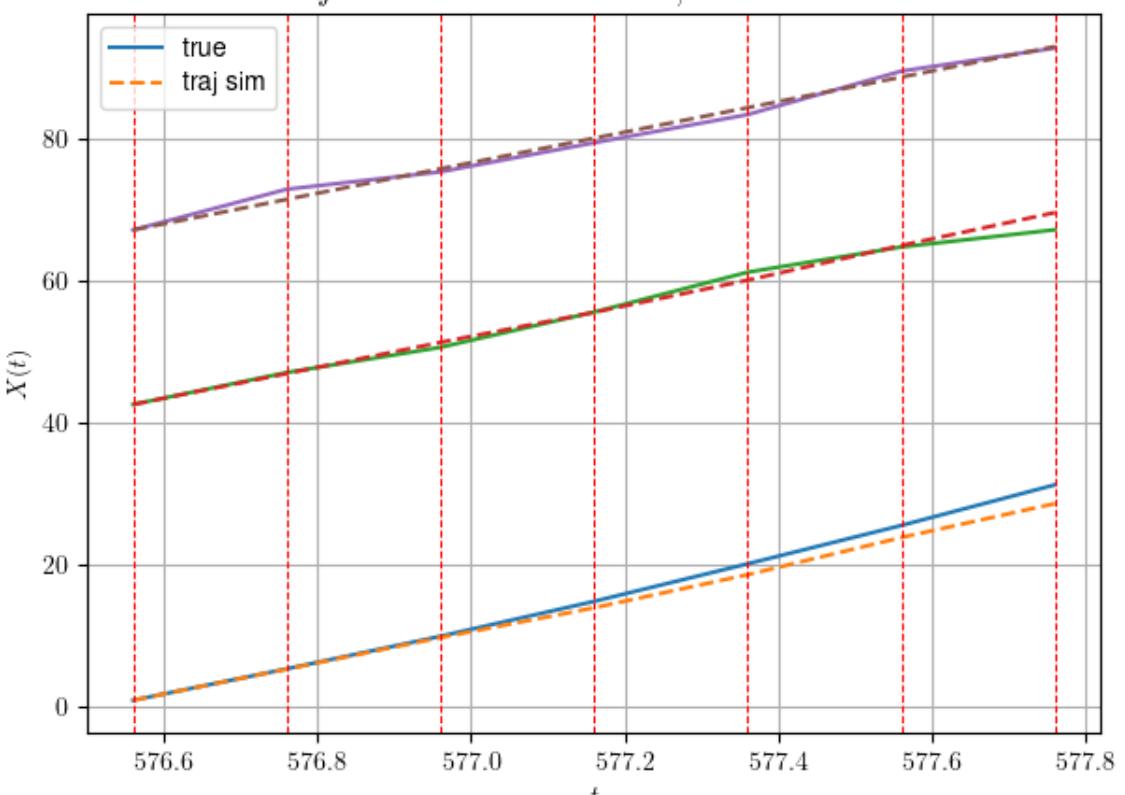
```

* err= 1.1932960320528494  

* Learning rate NN = 0.00015690525469835848  

* diff = 0.0058422639370256935
```

*df n. 3 – Scene n. 38, at it = 350*



For scene 38/55

```

* use LR_NN=0.0005 with err=19.656990583951735 at it=19
* v0_scn_mean = 22.243823703139324
* MAE = 0.9588131991067628
=====
```

```
=====
- Time interval n.0: [579.56, 579.76]
  * y_true: [21.03058275 42.18516565]
  * v_ann: [26.175569534301758, 25.752973556518555, 2
5.358438002860908]

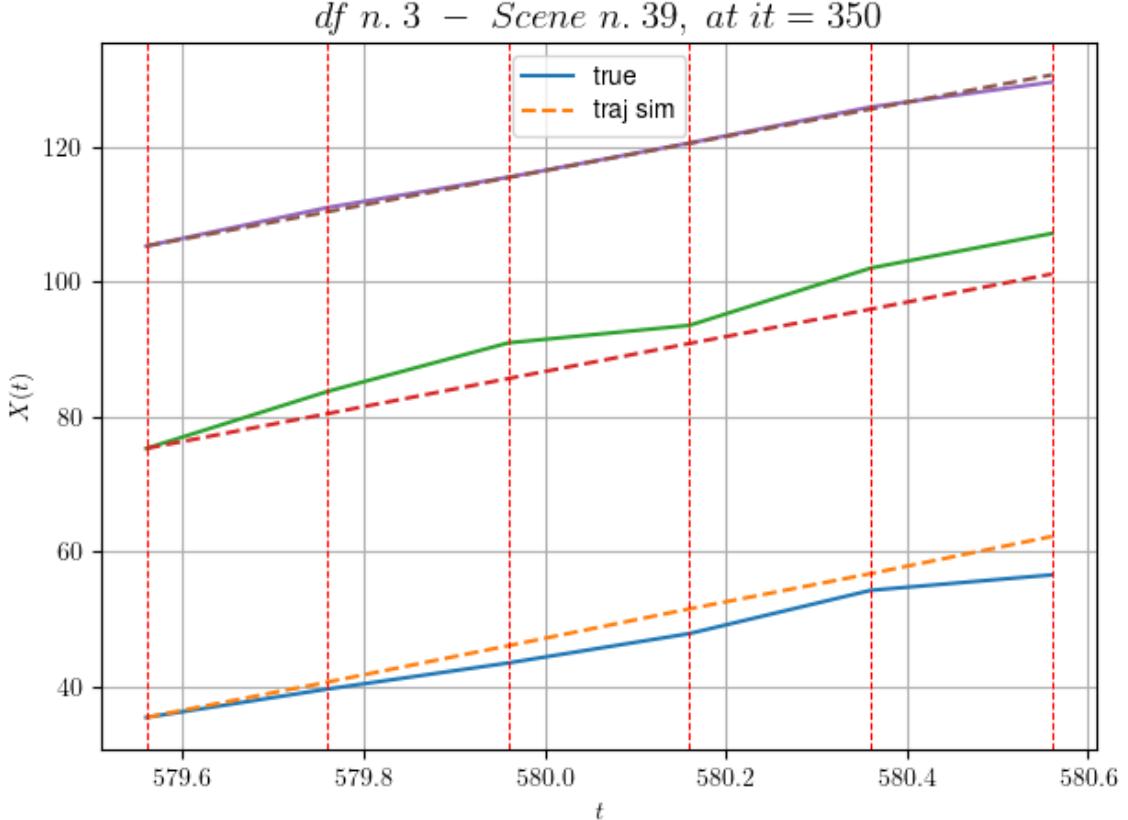
-----
- Time interval n.1: [579.76, 579.96]
  * y_true: [19.36065083 36.06520173]
  * v_ann: [26.987524032592773, 26.05910301208496, 2
5.358438002860908]

-----
- Time interval n.2: [579.96, 580.16]
  * y_true: [21.76088956 12.96224398]
  * v_ann: [27.306385040283203, 25.98809051513672, 2
5.358438002860908]

-----
- Time interval n.3: [580.16, 580.36]
  * y_true: [32.02164742 42.42773504]
  * v_ann: [26.074195861816406, 25.40158462524414, 2
5.358438002860908]

-----
- Time interval n.4: [580.36, 580.56]
  * y_true: [11.44064385 25.66536311]
  * v_ann: [27.566879272460938, 26.0847110748291, 25.
358438002860908]

-----
* err= 10.017588688847239
* Learning rate NN = 1.9371018424862996e-05
* diff = 0.0212164817817726
```



For scene 39/55

\* use LR\_NN=5e-05 with err=39.07278408968597 at it=19  
 \* v0\_scn\_mean = 25.756252522262212  
 \* MAE = 10.017588688847239

---



---

- Time interval n.0: [592.16, 592.36]  
 \* y\_true: [ 4.45046478 21.56401461]  
 \* v\_ann: [15.935111999511719, 15.775304794311523, 2  
 4.71001897344754]

---

- Time interval n.1: [592.36, 592.56]  
 \* y\_true: [14.40168088 21.61284101]  
 \* v\_ann: [14.326683044433594, 15.565744400024414, 2  
 4.71001897344754]

---

- Time interval n.2: [592.56, 592.76]  
 \* y\_true: [14.40168088 22.933287 ]  
 \* v\_ann: [14.301277160644531, 15.703169822692871, 2  
 4.71001897344754]

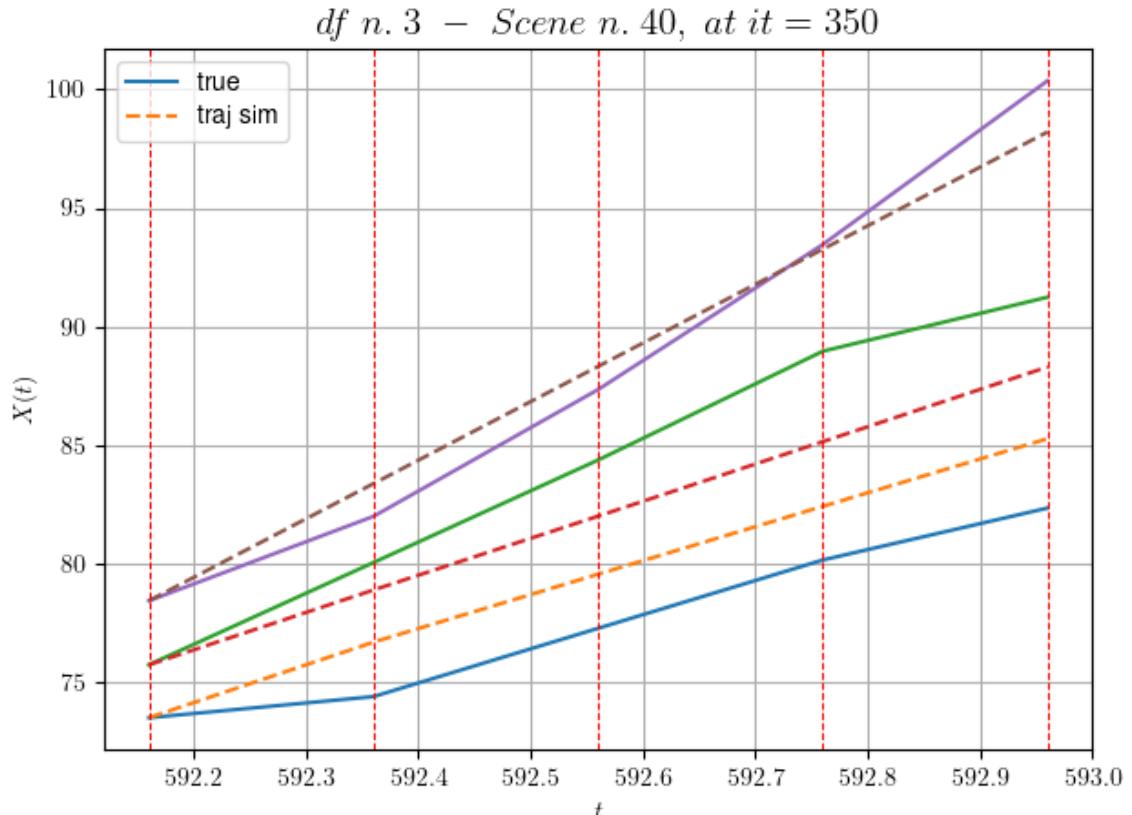
---

- Time interval n.3: [592.76, 592.96]  
 \* y\_true: [10.94538603 11.39186219]  
 \* v\_ann: [14.262839317321777, 15.74399471282959, 2  
 4.71001897344754]

```

* err= 4.124121268560821
* Learning rate NN = 0.000239148415857926
* diff = 0.00357117318467548

```



For scene 40/55

```

* use LR_NN=0.0005 with err=17.037992513529755 at it=19
* v0_scn_mean = 25.163407565696268
* MAE = 4.037092922208184

```

---



---

- Time interval n.0: [21.56, 21.76]  
\* y\_true: [26.48927836 26.93283237 27.60013316]  
\* v\_ann: [24.615890502929688, 24.418725967407227, 2  
4.724266052246094, 29.083788662827438]

---



---

- Time interval n.1: [21.76, 21.96]  
\* y\_true: [24.19440937 24.35304119 22.73494812]  
\* v\_ann: [26.059181213378906, 26.349346160888672, 2  
5.88808250427246, 29.083788662827438]

---

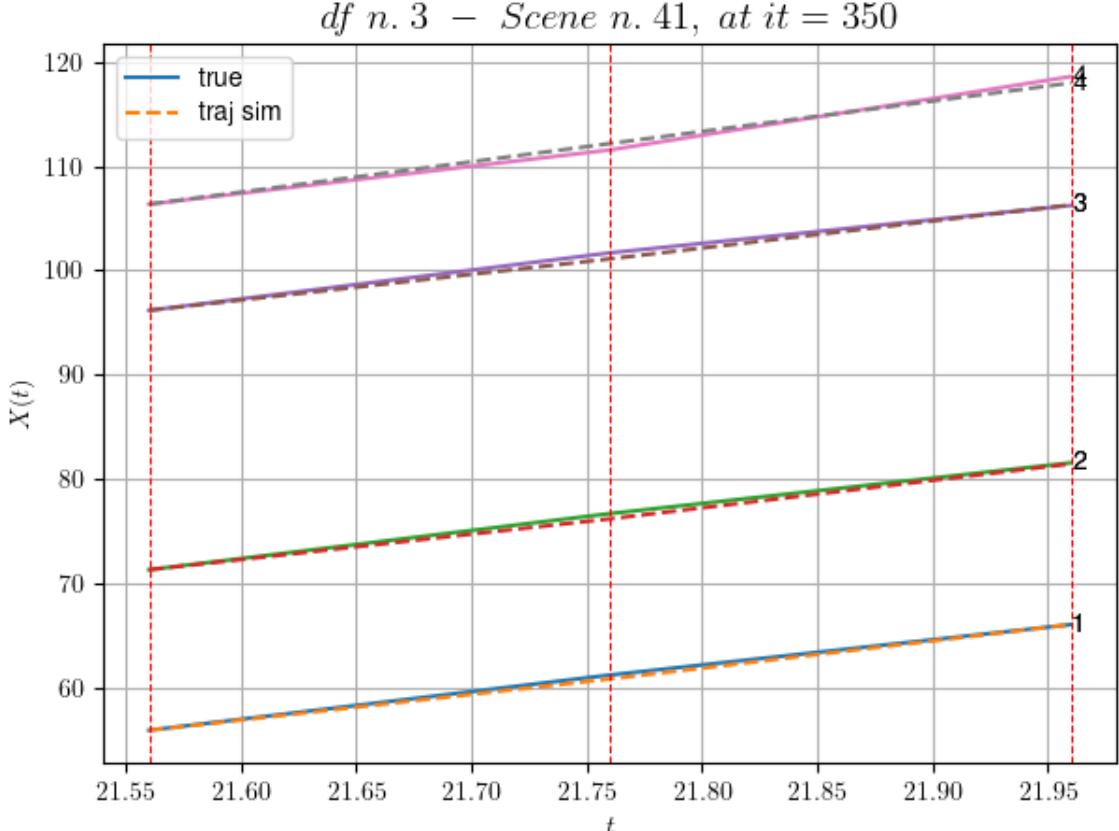


---

```

* err= 0.1242205054075138
* Learning rate NN = 0.00036449998151510954
* diff = 7.730153394752692e-07

```



For scene 41/55

\* use LR\_NN=0.0005 with err=3.923617770154979 at it=19  
 \* v0\_scn\_mean = 29.188365659888323  
 \* MAE = 0.12418959948828687

---



---

- Time interval n.0: [31.36, 31.56]  
 \* y\_true: [24.92105739 19.11766565 26.56610692]  
 \* v\_ann: [20.985729217529297, 22.197599411010742, 1  
 8.94379997253418, 30.91704367792893]

---

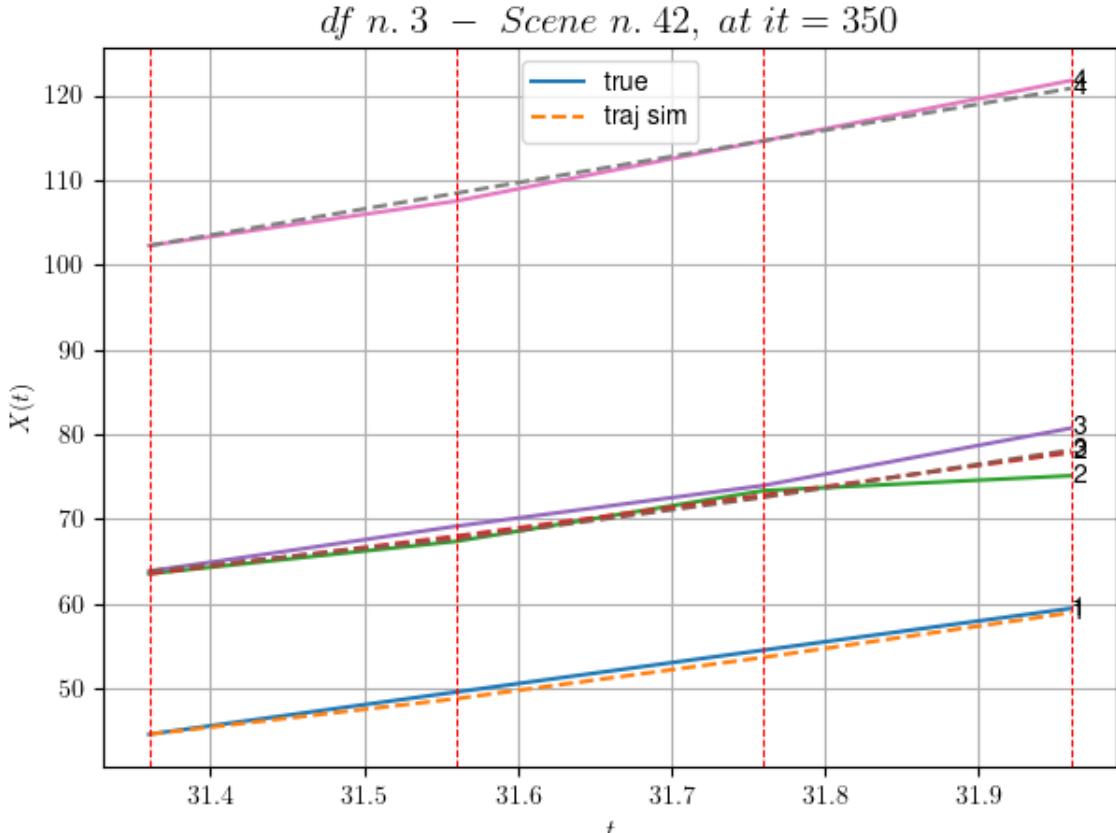
- Time interval n.1: [31.56, 31.76]  
 \* y\_true: [24.72130541 29.91666352 24.00857353]  
 \* v\_ann: [24.37675666809082, 24.16852569580078, 24.  
 644826889038086, 30.91704367792893]

---

- Time interval n.2: [31.76, 31.96]  
 \* y\_true: [24.58151426 8.80091982 33.80389928]  
 \* v\_ann: [26.350481033325195, 25.040748596191406, 2  
 7.902986526489258, 30.91704367792893]

---

\* err= 1.391340024171197  
 \* Learning rate NN = 0.0005904899444431067  
 \* diff = 8.145652145241655e-05



For scene 42/55

\* use LR\_NN=0.001 with err=15.516078758621955 at it=19  
 \* v0\_scn\_mean = 30.812371676917195  
 \* MAE = 0.5834155778294235

---



---

For scene 43/55

\* use LR\_NN=0.0005 with err=15.196929874661691 at it=19  
 \* v0\_scn\_mean = 25.099172339191735  
 \* MAE = 4.274273025663263

---



---

- Time interval n.0: [34.96, 35.16]  
 \* y\_true: [33.40218228 30.49313647 20.11252108]  
 \* v\_ann: [25.714658737182617, 25.744192123413086, 2  
 5.639833450317383, 34.0439495799761]

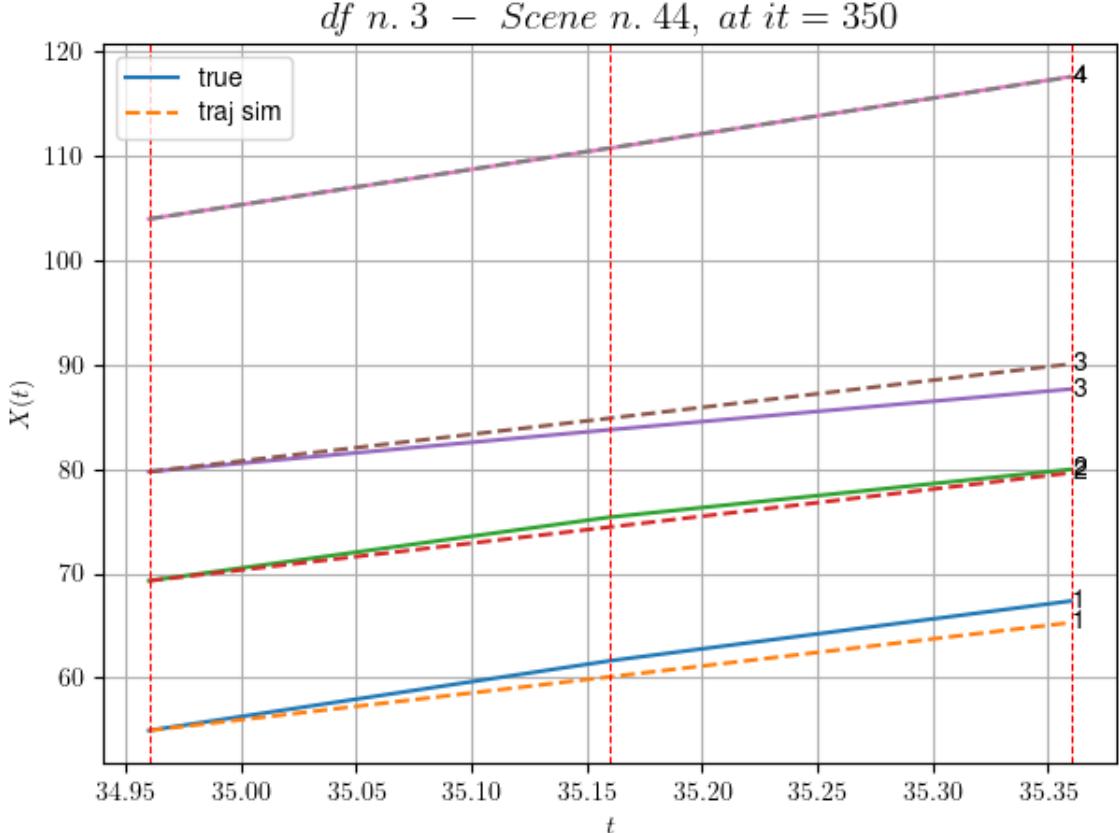
---

- Time interval n.1: [35.16, 35.36]  
 \* y\_true: [28.66899207 22.90260208 19.5026699 ]  
 \* v\_ann: [25.980249404907227, 25.97140884399414, 2  
 6.00191307067871, 34.0439495799761]

---

\* err= 1.2245966431075637

\* Learning rate NN = 7.289998757187277e-05  
 \* diff = 0.0002888898670865281



For scene 44/55

\* use LR\_NN=0.0001 with err=10.24597504865998 at it=19  
 \* v0\_scn\_mean = 33.582370372012356  
 \* MAE = 1.1462733522929858

- 
- 
- Time interval n.0: [83.36, 83.56]
    - \* y\_true: [27.1108197 22.97496526 13.79424223]
    - \* v\_ann: [30.45500373840332, 28.849225997924805, 28.50033950805664, 26.108277505261047]

---

  - Time interval n.1: [83.56, 83.76]
    - \* y\_true: [28.73111951 35.1785896 26.83859352]
    - \* v\_ann: [20.131916046142578, 25.054738998413086, 25.847814559936523, 26.108277505261047]

---

  - Time interval n.2: [83.76, 83.96]
    - \* y\_true: [29.25142438 34.77932949 18.27648805]
    - \* v\_ann: [29.315080642700195, 28.122713088989258, 28.02354621887207, 26.108277505261047]

---

  - Time interval n.3: [83.96, 84.16]

```

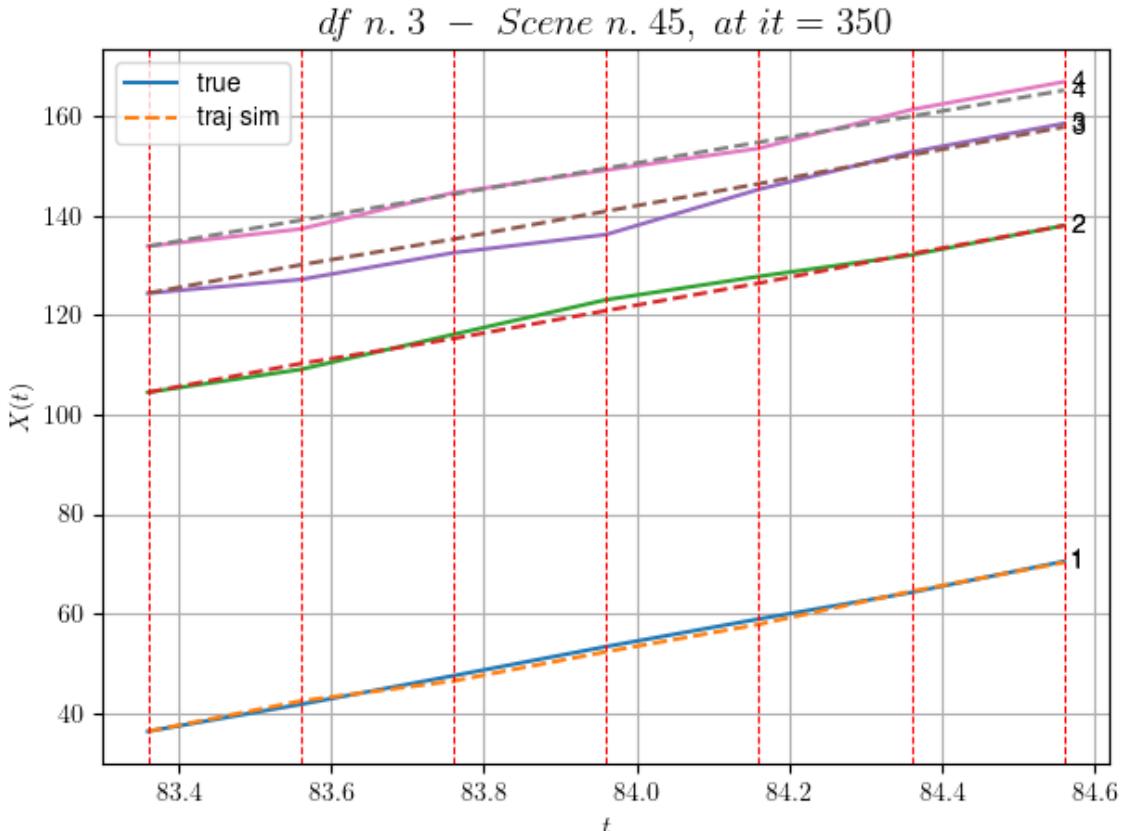
* y_true: [27.70171969 23.46694627 45.36715188]
* v_ann: [27.53479766845703, 27.566503524780273, 2
7.56659698486328, 26.108277505261047]

-----
- Time interval n.4: [84.16, 84.36]
* y_true: [26.72197507 21.43687952 37.53588876]
* v_ann: [33.19501876831055, 29.550762176513672, 2
8.89473533630371, 26.108277505261047]

-----
- Time interval n.5: [84.36, 84.56]
* y_true: [31.24277517 29.71036516 28.7233215 ]
* v_ann: [28.94648551940918, 28.253780364990234, 2
8.074491500854492, 26.108277505261047]

-----
* err= 2.2350085548390766
* Learning rate NN = 0.00015690525469835848
* diff = 6.053755510531255e-05

```



For scene 45/55

```

* use LR_NN=0.0005 with err=110.18702386898966 at it=19
* v0_scn_mean = 26.552481408205672
* MAE = 2.2150619584236644
=====
```

For scene 46/55

```
* use LR_NN=0.001 with err=23.897275682026315 at it=19
```

```
* v0_scn_mean = 29.593790259949973
* MAE = 1.1050431404976826
```

---



---

```
- Time interval n.0: [142.16, 142.36]
* y_true: [31.90177154 33.47450881 19.84324761]
* v_ann: [26.539993286132812, 26.726667404174805, 2
6.317508697509766, 28.121504824700015]
```

---

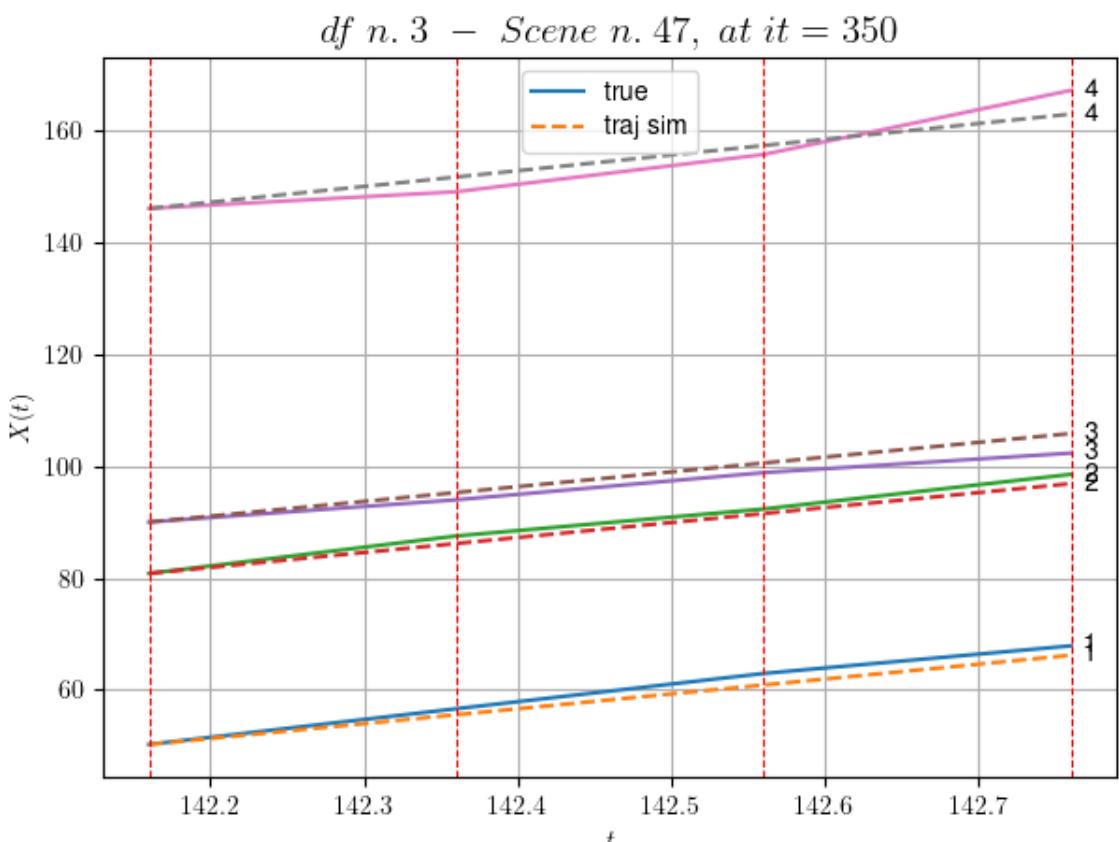
```
- Time interval n.1: [142.36, 142.56]
* y_true: [31.50218522 24.08376432 24.27420294]
* v_ann: [26.580934524536133, 26.76845359802246, 2
6.395248413085938, 28.121504824700015]
```

---

```
- Time interval n.2: [142.56, 142.76]
* y_true: [24.70204715 30.9853993 17.45337402]
* v_ann: [26.59462547302246, 26.768840789794922, 2
6.38562774658203, 28.121504824700015]
```

---

```
* err= 3.61589738802273
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.005793743106955684
```



For scene 47/55

\* use LR\_NN=1e-05 with err=34.724776179352574 at it=19

```
* v0_scn_mean = 28.335917566014114
* MAE = 2.8305833240243246
```

---



---

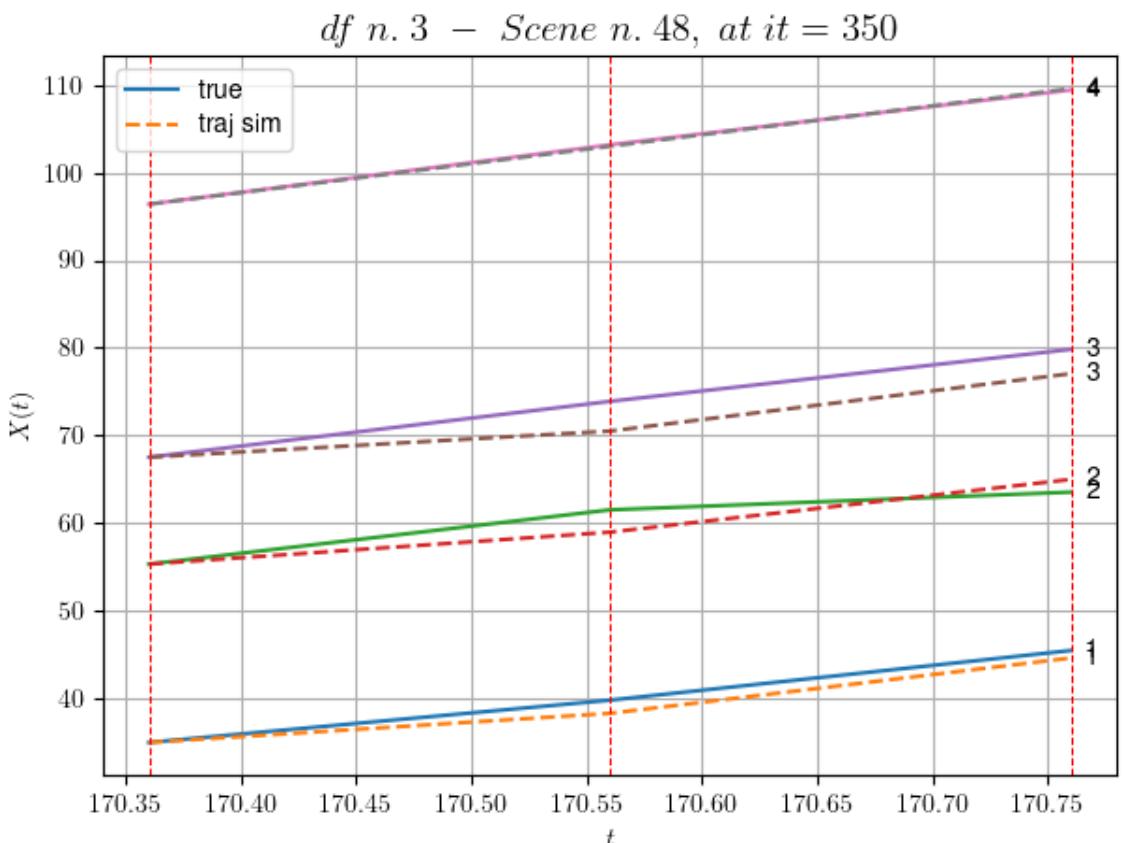
```
- Time interval n.0: [170.36, 170.56]
  * y_true: [24.1106547 30.95205085 31.86307572]
  * v_ann: [16.61099624633789, 18.227313995361328, 1
4.920310974121094, 32.99611396138362]
```

---

```
- Time interval n.1: [170.56, 170.76]
  * y_true: [28.33103197 10.10076519 29.63331411]
  * v_ann: [31.56001091003418, 30.09109115600586, 32.
74980545043945, 32.99611396138362]
```

---

```
* err= 2.563444625024922
* Learning rate NN = 0.0007289999630302191
* diff = 0.00031305871399300855
```



For scene 48/55

```
* use LR_NN=0.001 with err=2.794829113697448 at it=19
* v0_scn_mean = 32.654135437192195
* MAE = 1.0938116070976887
```

---



---

- Time interval n.0: [248.16, 248.36]  
 \* y\_true: [31.21204442 24.6823336 32.34552948]  
 \* v\_ann: [33.1444091796875, 33.856109619140625, 32.  
 43177795410156, 30.248935217315484]

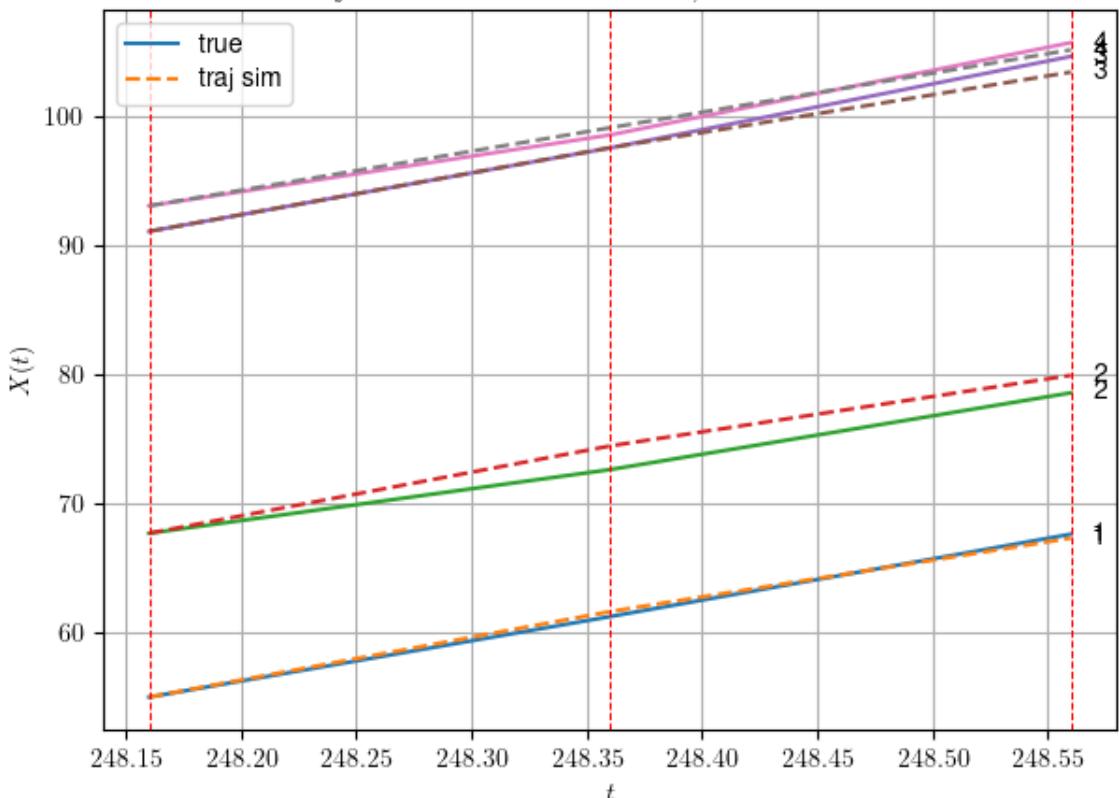
---

- Time interval n.1: [248.36, 248.56]  
 \* y\_true: [31.9625999 29.77329807 35.48696999]  
 \* v\_ann: [28.493820190429688, 27.394485473632812, 2  
 9.336904525756836, 30.248935217315484]

---

\* err= 0.6286437218744874  
 \* Learning rate NN = 0.0007289999630302191  
 \* diff = 1.7167618873825674e-05

*df n. 3 – Scene n. 49, at it = 350*



For scene 49/55

\* use LR\_NN=0.001 with err=19.75672945698446 at it=19  
 \* v0\_scn\_mean = 30.220521579071338  
 \* MAE = 0.6242745796506388

---

- Time interval n.0: [320.56, 320.76]  
 \* y\_true: [27.61038846 20.60122903 24.07186814]  
 \* v\_ann: [34.163002014160156, 31.150192260742188, 3  
 3.90595626831055, 28.130406759666638]

---

```

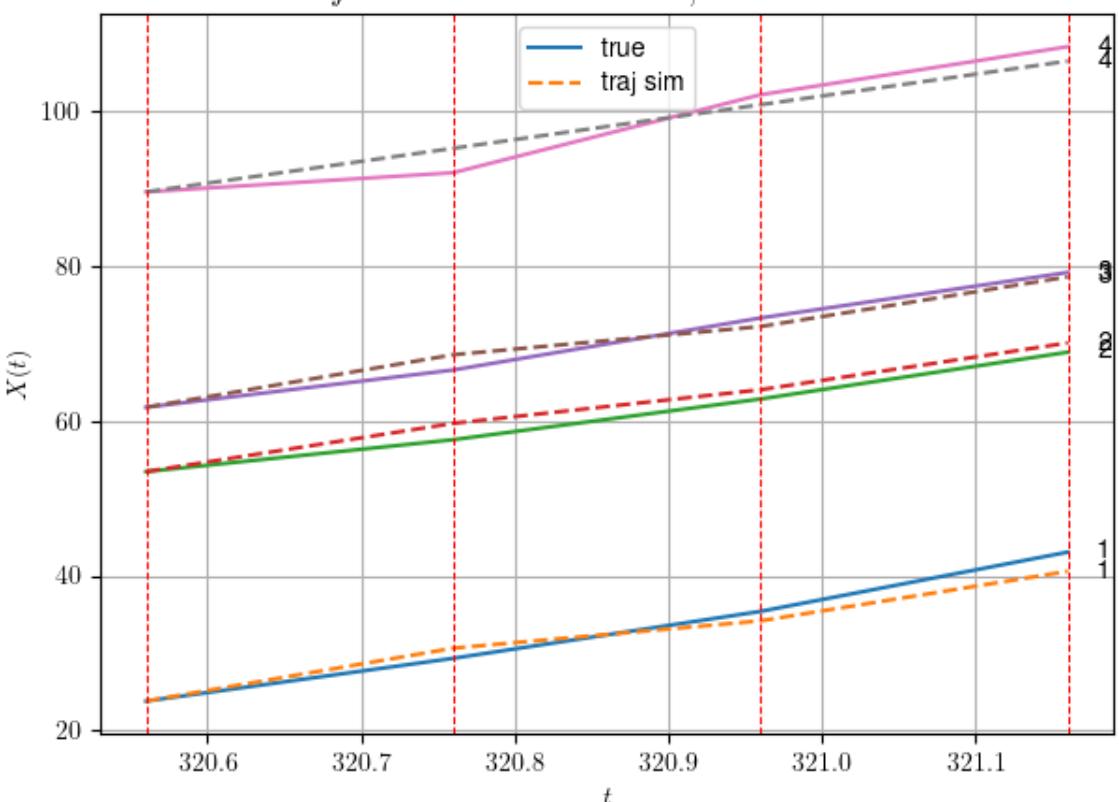
- Time interval n.1: [320.76, 320.96]
  * y_true: [30.26064275 26.25184013 33.56317876]
  * v_ann: [17.61450958251953, 21.671323776245117, 1
  8.195711135864258, 28.130406759666638]

-----
- Time interval n.2: [320.96, 321.16]
  * y_true: [38.25114958 30.20253063 29.36323845]
  * v_ann: [31.9204044342041, 30.21126937866211, 32.0
  6136703491211, 28.130406759666638]

-----
* err= 2.320218642836679
* Learning rate NN = 0.0005904899444431067
* diff = A 00115210605715375

```

*df n. 3 – Scene n. 50, at it = 350*



For scene 50/55

```

* use LR_NN=0.001 with err=10.853717087529741 at it=19
* v0_scn_mean = 28.343803427953556
* MAE = 1.651123561983326

```

```

=====
=====
- Time interval n.0: [333.96, 334.16]
  * y_true: [31.40121985 21.58136302 16.05156144]
  * v_ann: [29.75279998779297, 29.532527923583984, 2
  9.61368179321289, 24.21959719997416]

```

```

=====
- Time interval n.1: [334.16, 334.36]
```

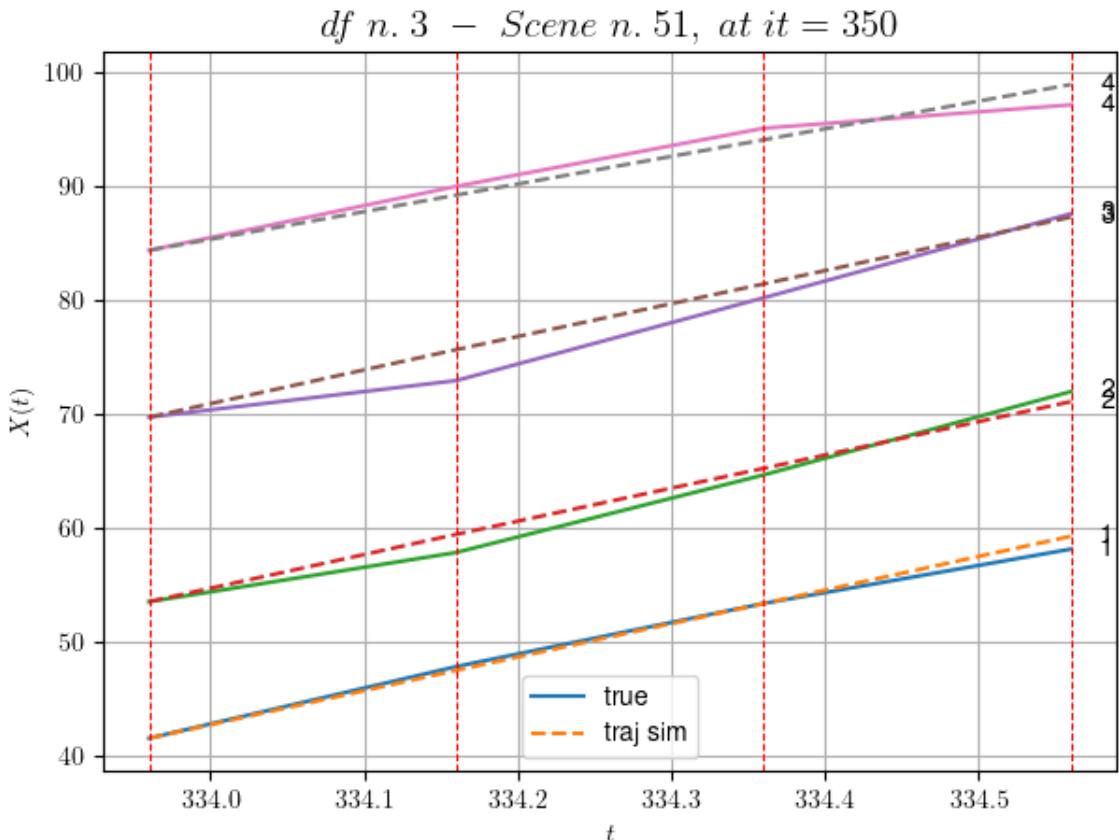
```

* y_true: [27.67132891 33.9725354 36.25406589]
* v_ann: [29.260709762573242, 28.90464210510254, 2
8.767351150512695, 24.21959719997416]

-----
- Time interval n.2: [334.36, 334.56]
* y_true: [23.81145278 36.52334008 36.85496039]
* v_ann: [29.508373260498047, 29.25006675720215, 2
9.290056228637695, 24.21959719997416]

-----
* err= 1.1690684383417498
* Learning rate NN = 5.904899080633186e-05
* diff = 0.00014370592148993389

```



For scene 51/55

```

* use LR_NN=0.0001 with err=4.374771225213381 at it=19
* v0_scn_mean = 24.87937638202892
* MAE = 1.161939950435816

```

```

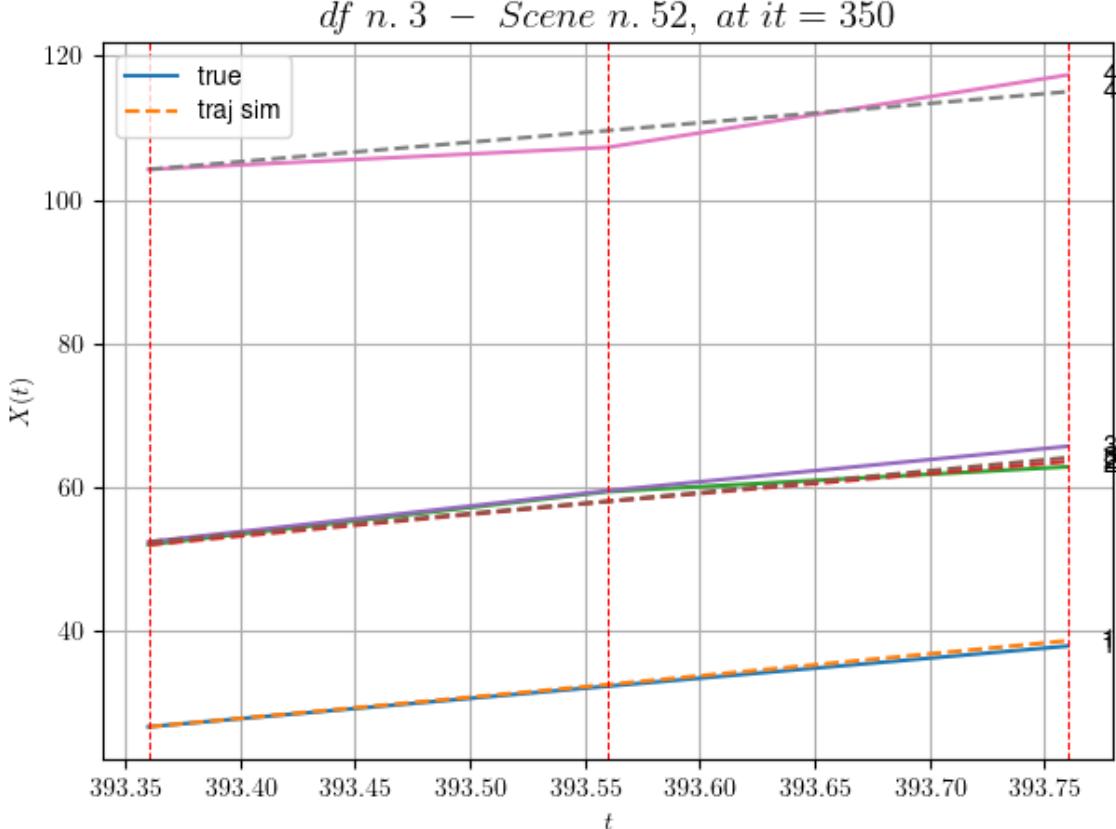
=====
=====
- Time interval n.0: [393.36, 393.56]
* y_true: [28.21049617 36.91227562 35.66212709]
* v_ann: [29.371822357177734, 30.08201789855957, 2
8.306108474731445, 27.00671910788577]

=====
- Time interval n.1: [393.56, 393.76]

```

```
* y_true: [27.89067116 17.24119841 30.82238865]
* v_ann: [30.4855564880371, 27.780658721923828, 3
0.30460548400879, 27.00671910788577]
```

```
-----  
-----  
* err= 1.5451655329648557  
* Learning rate NN = 7.289998757187277e-05  
* diff = 5.099437682298813e-05
```



For scene 52/55

```
* use LR_NN=0.0001 with err=16.014899806605822 at it=19
* v0_scn_mean = 27.348374263587086
* MAE = 1.4832225581676433
```

```
=====  
-----  
-----  
- Time interval n.0: [521.76, 521.96]  
* y_true: [10.54036018 15.07054541 11.30098461]  
* v_ann: [15.034915924072266, 15.00855541229248, 1  
5.021486282348633, 17.249600462639368]
```

```
-----  
-----  
- Time interval n.1: [521.96, 522.16]  
* y_true: [20.11080333 12.92054275 19.50185752]  
* v_ann: [14.917736053466797, 14.870739936828613, 1  
4.894996643066406, 17.249600462639368]
```

```
-----  
-----  
- Time interval n.2: [522.16, 522.36]
```

```

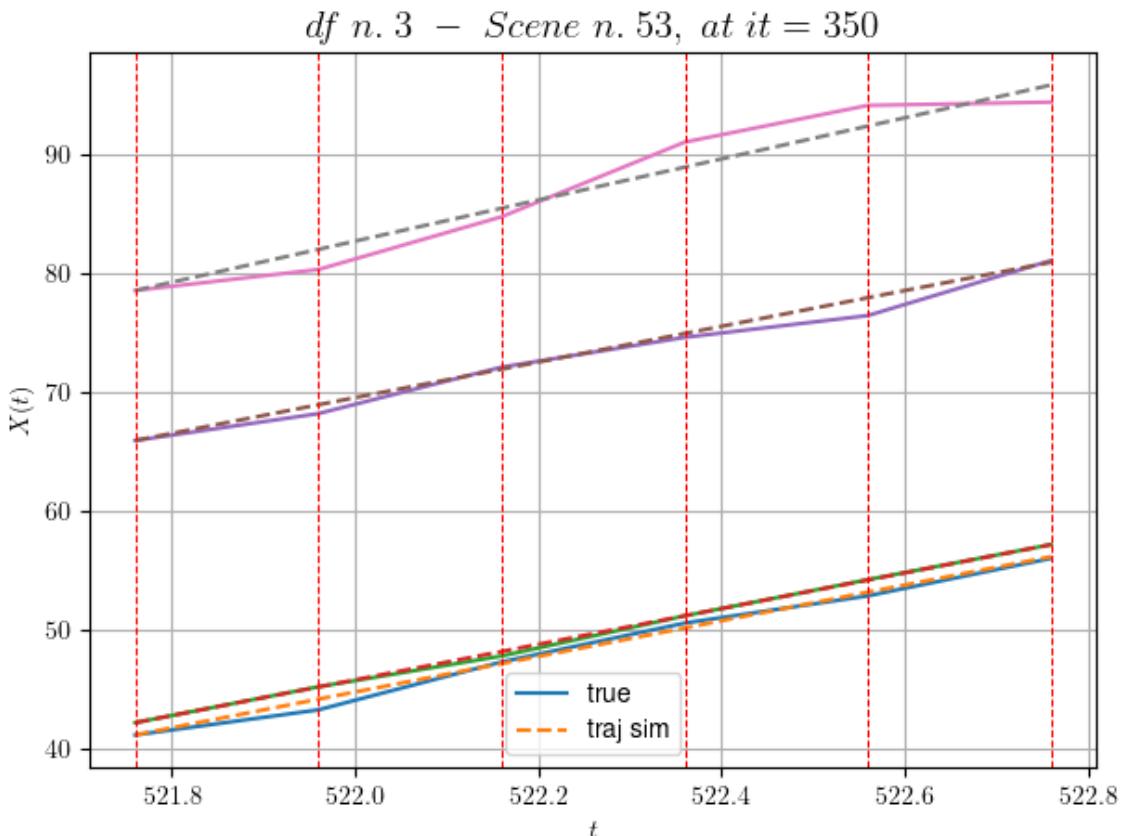
* y_true: [16.31074126 16.85079656 12.50130097]
* v_ann: [14.958535194396973, 15.00235366821289, 1
5.016489028930664, 17.249600462639368]

-----
- Time interval n.3: [522.36, 522.56]
* y_true: [11.43058292 15.20080004 9.15100954]
* v_ann: [15.023277282714844, 15.015005111694336, 1
5.022904396057129, 17.249600462639368]

-----
- Time interval n.4: [522.56, 522.76]
* y_true: [15.72089895 14.72089277 23.10276913]
* v_ann: [14.908230781555176, 14.857163429260254, 1
4.86827278137207, 17.249600462639368]

-----
* err= 0.7121648355317378
* Learning rate NN = 3.874203684972599e-05
* diff = 1.726398451584732e-05

```



For scene 53/55

```

* use LR_NN=0.0001 with err=32.19660174545088 at it=19
* v0_scn_mean = 18.704939903274198
* MAE = 0.7081608852538857

```

---

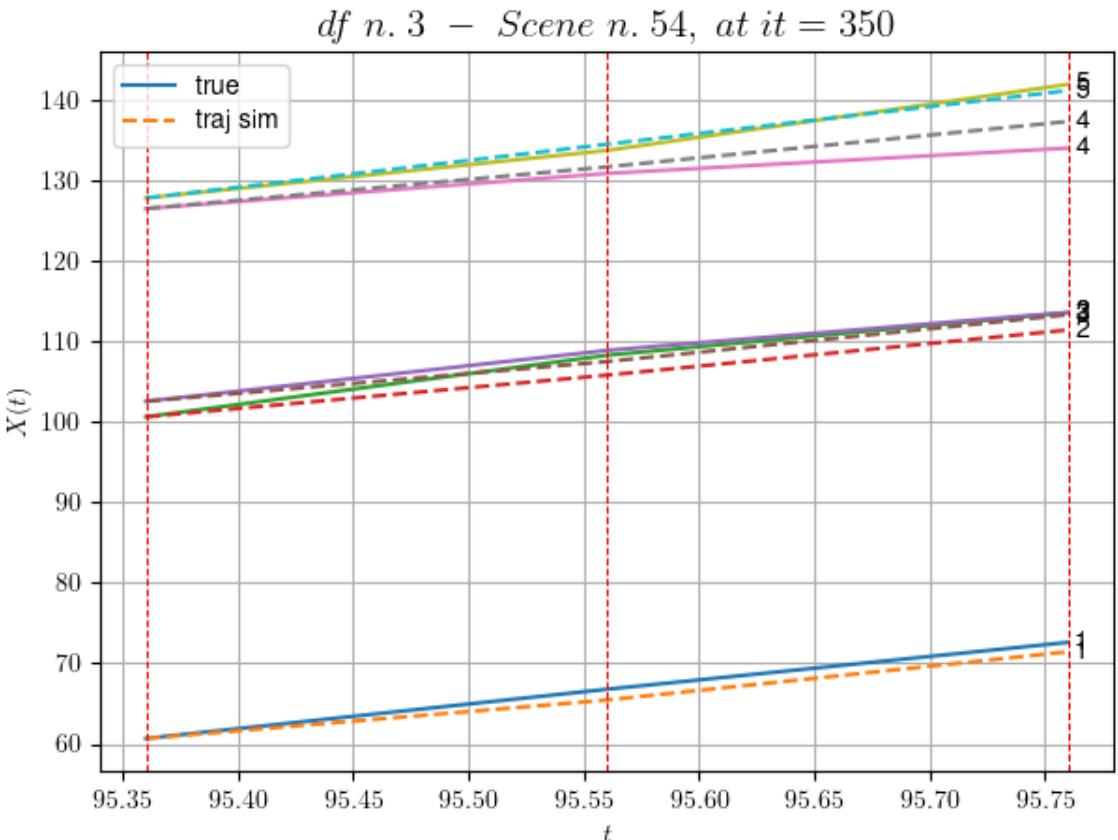


---

- Time interval n.0: [95.36, 95.56]

```
* y_true: [30.52238998 38.21809619 31.62683865 21.8  
1676128]  
* v_ann: [23.845670700073242, 25.862186431884766, 2  
4.694522857666016, 25.89435577392578, 33.34860961624609]  
-----  
-----  
- Time interval n.1: [95.56, 95.76]  
* y_true: [29.11270185 26.43618159 23.59563306 15.7  
3527867]  
* v_ann: [29.958499908447266, 28.057947158813477, 2  
9.060199737548828, 28.179649353027344, 33.34860961624609]
```

```
* err= 1.9092671821365648  
* Learning rate NN = 0.00036449998151510954  
* diff = 1.1531270420575322e-05
```



For scene 54/55

```
* use LR_NN=0.0005 with err=19.381706044719127 at it=19  
* v0_scn_mean = 32.873133483201805  
* MAE = 1.9083989434163662
```

For df=3 with 55 scenes, time taken: 639.02

In df n.4/10 we have 30 scenes

```
*****
*****
```

For scene 0/30

- \* use LR\_NN=0.0005 with err=11.680605117442097 at it=19
- \* v0\_scn\_mean = 35.61121563984123
- \* MAE = 2.248391521850327

```
=====
=====
```

- Time interval n.0: [19.84, 20.04]

- \* y\_true: [38.50393497 35.76621737]

\* v\_ann: [30.626131057739258, 29.431468963623047, 2  
6.058995147815423]

```
-----
-----
```

- Time interval n.1: [20.04, 20.24]

- \* y\_true: [14.10165462 33.63672046]

\* v\_ann: [31.762958526611328, 30.001737594604492, 2  
6.058995147815423]

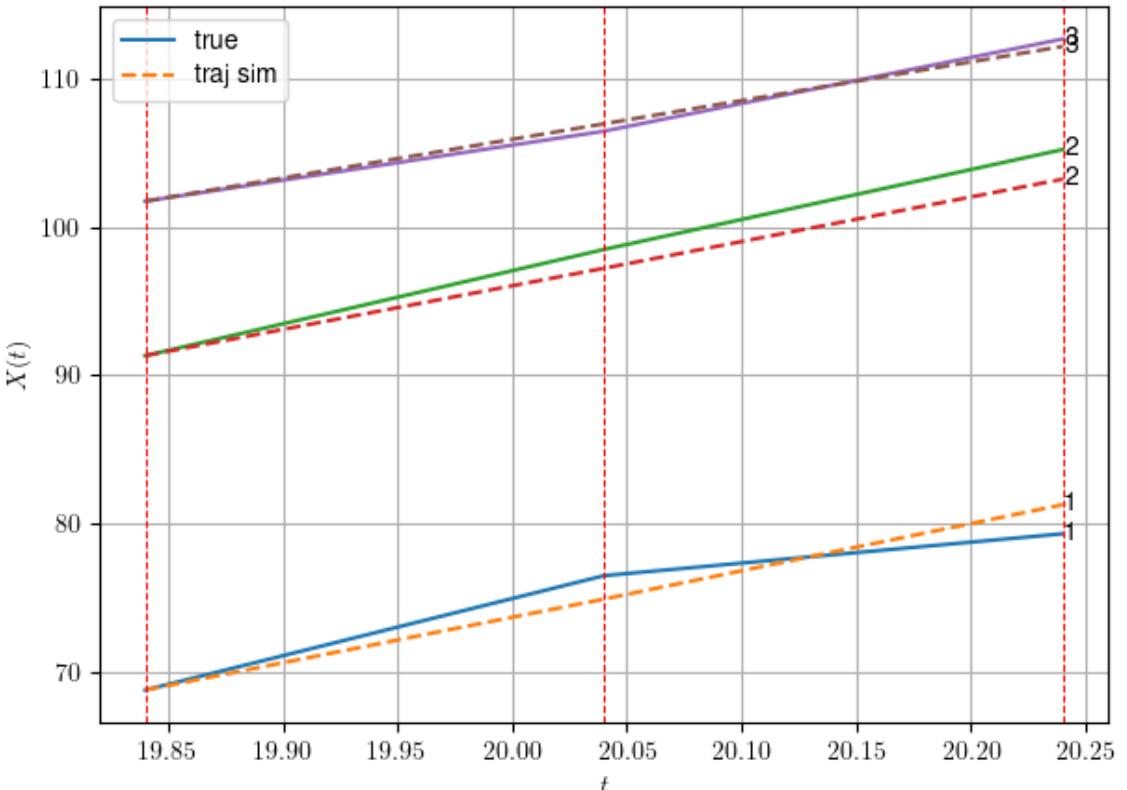
```
-----
-----
```

\* err= 1.3761919682872028

\* Learning rate NN = 7.289998757187277e-05

\* diff = 0.00042227767285840656

*df n. 4 – Scene n. 1, at it = 350*



For scene 1/30

- \* use LR\_NN=0.0001 with err=10.6158278413586 at it=19
- \* v0\_scn\_mean = 26.396766991043386
- \* MAE = 1.3761919682872028

```
=====
=====

    - Time interval n.0: [23.64, 23.84]
        * y_true: [16.50112189 27.57447859]
        * v_ann: [16.5927677154541, 17.63410186767578, 25.9
5.974604646459856]

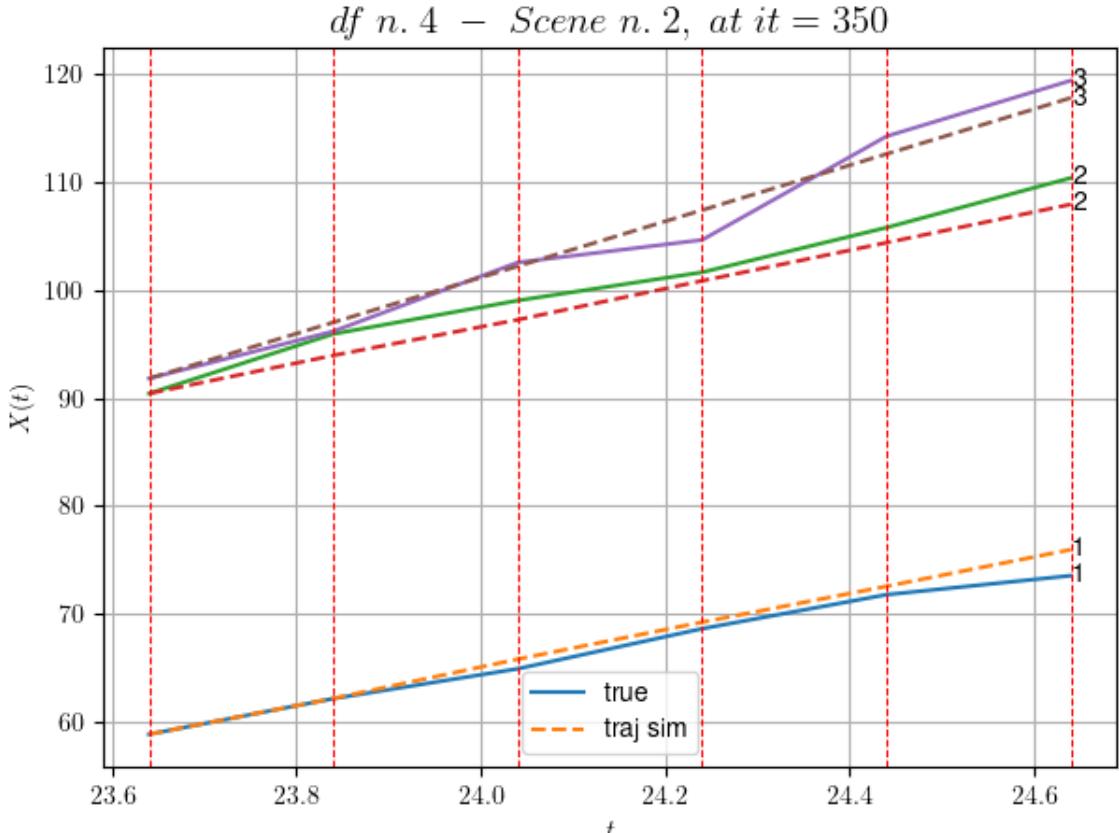
-----
    - Time interval n.1: [23.84, 24.04]
        * y_true: [13.80103575 15.46275359]
        * v_ann: [18.156747817993164, 16.511442184448242, 2
5.974604646459856]

-----
    - Time interval n.2: [24.04, 24.24]
        * y_true: [18.55153987 13.07248815]
        * v_ann: [17.117244720458984, 18.01714324951172, 2
5.974604646459856]

-----
    - Time interval n.3: [24.24, 24.44]
        * y_true: [15.75144675 20.6942352 ]
        * v_ann: [16.611099243164062, 17.658077239990234, 2
5.974604646459856]

-----
    - Time interval n.4: [24.44, 24.64]
        * y_true: [ 8.80086699 23.00509018]
        * v_ann: [16.992412567138672, 17.733598709106445, 2
5.974604646459856]

-----
    * err= 2.0535505645595067
    * Learning rate NN = 0.0001937102060765028
    * diff = 0.00012555317868834237
```



For scene 2/30

```
* use LR_NN=0.0005 with err=41.94995666718079 at it=19
* v0_scn_mean = 26.31960934939314
* MAE = 1.961044792759564
```

---



---

- Time interval n.0: [80.24, 80.44]
  - \* y\_true: [20.8407888 28.56113721]
  - \* v\_ann: [26.569547653198242, 27.273258209228516, 2
  - 2.36782942305619]

---

- Time interval n.1: [80.44, 80.64]
  - \* y\_true: [28.49133895 28.481454 ]
  - \* v\_ann: [26.347606658935547, 26.368837356567383, 2
  - 2.36782942305619]

---

- Time interval n.2: [80.64, 80.84]
  - \* y\_true: [29.84173661 32.11200361]
  - \* v\_ann: [26.7303466796875, 27.136411666870117, 22.
  - 36782942305619]

---

- Time interval n.3: [80.84, 81.04]
  - \* y\_true: [10.79069268 21.14157827]
  - \* v\_ann: [27.479549407958984, 28.479982376098633, 2

2.36782942305619]

---

- Time interval n.4: [81.04, 81.24]
  - \* y\_true: [20.33152897 19.96178137]
  - \* v\_ann: [25.171545028686523, 24.37582778930664, 2

2.36782942305619]

---

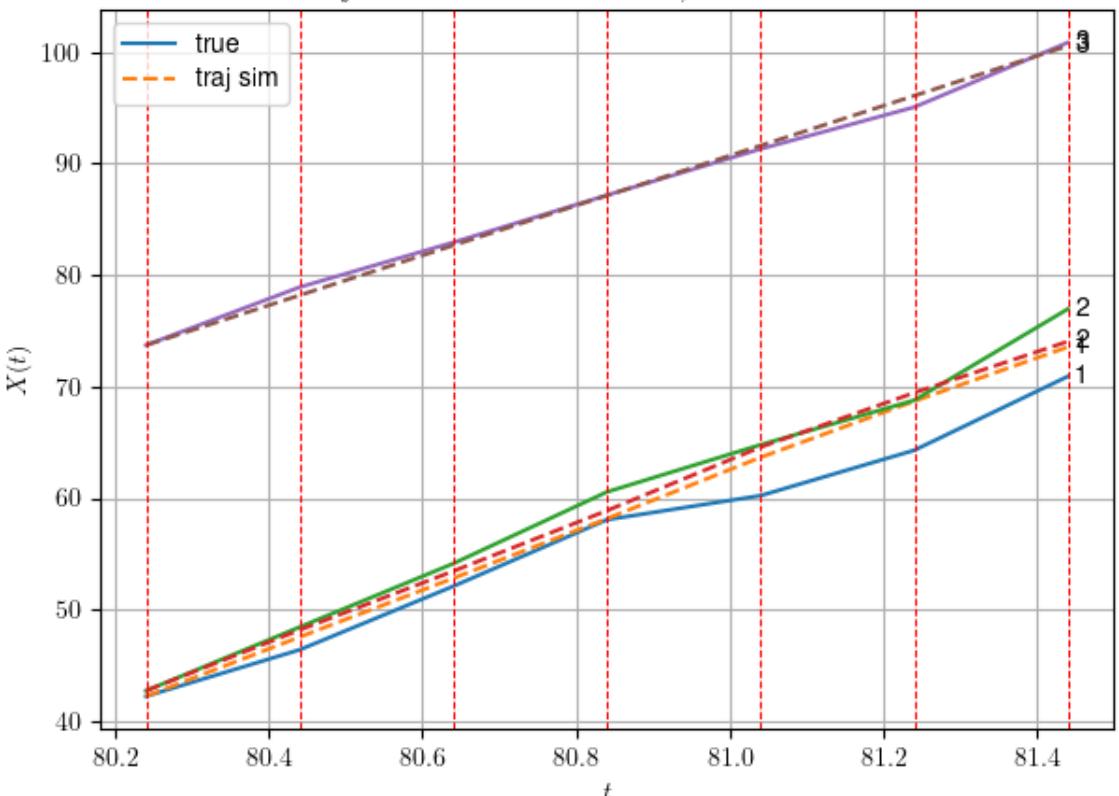
- Time interval n.5: [81.24, 81.44]
  - \* y\_true: [33.14293198 40.94411969]
  - \* v\_ann: [24.315105438232422, 23.003042221069336, 2

2.36782942305619]

---

- \* err= 2.574763928454213
- \* Learning rate NN = 0.00015690525469835848
- \* diff = 0.00029689811769273433

*df n. 4 – Scene n. 3, at it = 350*



For scene 3/30

- \* use LR\_NN=0.0005 with err=81.41218223509162 at it=19
- \* v0\_scn\_mean = 23.02196013851969
- \* MAE = 2.574763928454213

---



---

- Time interval n.0: [89.04, 89.24]
  - \* y\_true: [19.34082001 24.8230577 ]
  - \* v\_ann: [19.618221282958984, 20.29630470275879, 3

2.77541157779934]

---

- Time interval n.1: [89.24, 89.44]
  - \* y\_true: [14.120693 17.32233598]
  - \* v\_ann: [19.775373458862305, 20.4846248626709, 32.

77541157779934]

---

- Time interval n.2: [89.44, 89.64]
  - \* y\_true: [18.19104002 31.50485669]
  - \* v\_ann: [19.069238662719727, 19.56142807006836, 3

2.77541157779934]

---

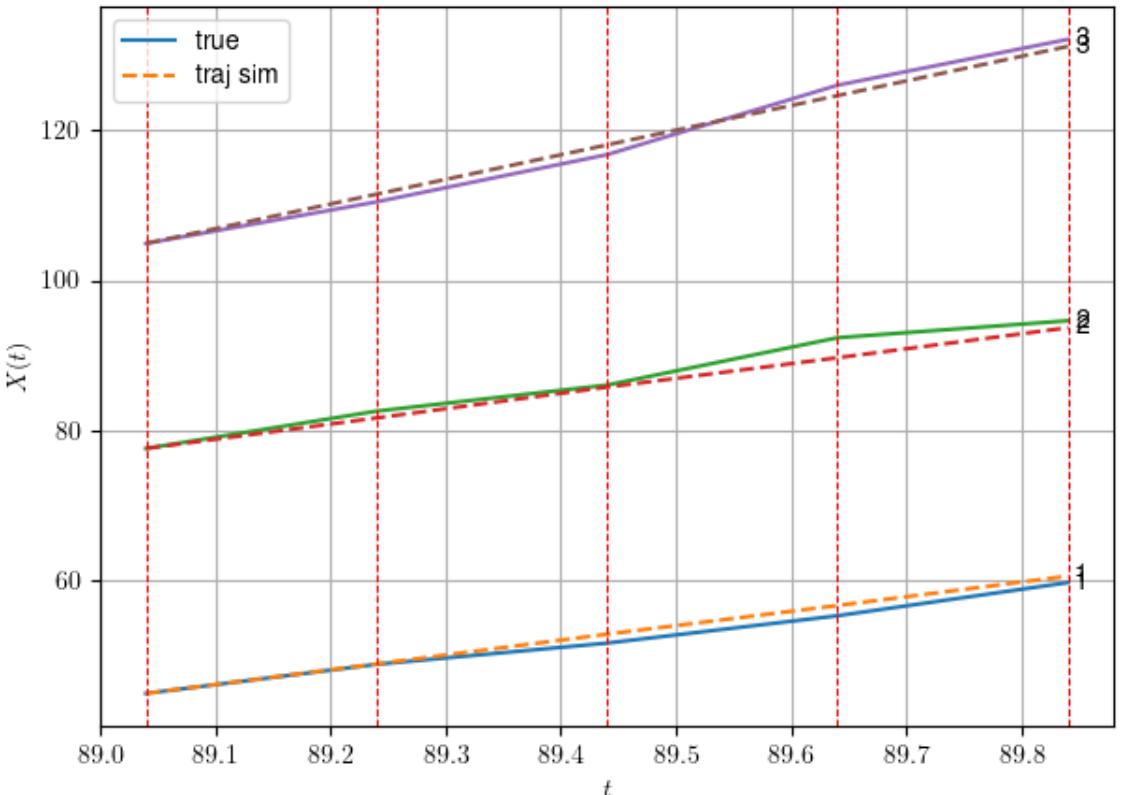
- Time interval n.3: [89.64, 89.84]
  - \* y\_true: [22.07139916 11.31182118]
  - \* v\_ann: [19.57564353942871, 19.973337173461914, 3

2.77541157779934]

---

- \* err= 1.2234135953568972
- \* Learning rate NN = 4.7829678806010634e-05
- \* diff = 0 00031544340845535146

*df n. 4 – Scene n. 4, at it = 350*



For scene 4/30

- \* use LR\_NN=0.0001 with err=3.986043344178521 at it=19
- \* v0\_scn\_mean = 32.537539278852584
- \* MAE = 1.2234135953568972

```
=====
- Time interval n.0: [96.44, 96.64]
  * y_true: [16.86045215 20.08121647]
  * v_ann: [19.281095504760742, 19.100027084350586, 1
8.40136441642366]

-----
- Time interval n.1: [96.64, 96.84]
  * y_true: [17.24055532 8.93061591]
  * v_ann: [19.076875686645508, 18.892444610595703, 1
8.40136441642366]

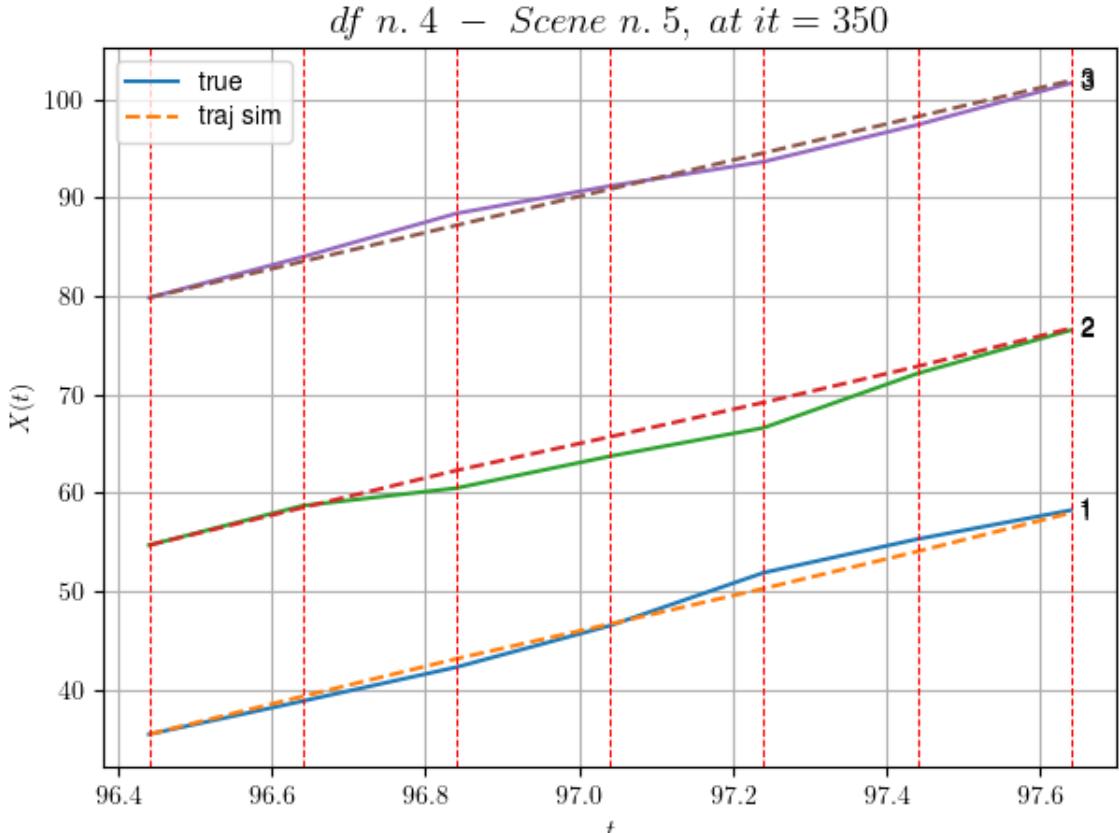
-----
- Time interval n.2: [96.84, 97.04]
  * y_true: [21.11081641 16.18118624]
  * v_ann: [17.688457489013672, 17.087383270263672, 1
8.40136441642366]

-----
- Time interval n.3: [97.04, 97.24]
  * y_true: [26.9212791 14.46120094]
  * v_ann: [18.04203224182129, 17.46765899658203, 18.
40136441642366]

-----
- Time interval n.4: [97.24, 97.44]
  * y_true: [17.07093447 27.60253797]
  * v_ann: [18.83283805847168, 18.30862045288086, 18.
40136441642366]

-----
- Time interval n.5: [97.44, 97.64]
  * y_true: [14.70092006 22.05229805]
  * v_ann: [19.629884719848633, 19.417583465576172, 1
8.40136441642366]

-----
* err= 1.0920131464536889
* Learning rate NN = 0.00015690525469835848
* diff = 0.0007508490744168039
```



For scene 5/30

```
* use LR_NN=0.0005 with err=31.432182254680423 at it=19
* v0_scn_mean = 19.395449089479236
* MAE = 1.061671142807507
```

---



---

```
- Time interval n.0: [182.24, 182.44]
* y_true: [18.61043577 13.125309 ]
* v_ann: [19.71595573425293, 20.16777801513672, 20.
773266238582984]
```

---

```
- Time interval n.1: [182.44, 182.64]
* y_true: [12.51734154 21.64870909]
* v_ann: [16.401653289794922, 18.079301834106445, 2
0.773266238582984]
```

---

```
- Time interval n.2: [182.64, 182.84]
* y_true: [15.03048681 24.29091592]
* v_ann: [19.08622932434082, 17.72199249267578, 20.
773266238582984]
```

---

```
- Time interval n.3: [182.84, 183.04]
* y_true: [10.23036632 31.71160501]
* v_ann: [19.24571418762207, 18.55939483642578, 20.
```

773266238582984]

```

-----  

-----  

    - Time interval n.4: [183.04, 183.24]  

      * y_true: [15.12061978 22.63128316]  

      * v_ann: [19.581256866455078, 19.684734344482422, 2  

0.773266238582984]  

-----  

-----  

    - Time interval n.5: [183.24, 183.44]  

      * y_true: [17.50081627 28.99215837]  

      * v_ann: [19.434968948364258, 19.29288673400879, 2  

0.773266238582984]  

-----  

-----  

    - Time interval n.6: [183.44, 183.64]  

      * y_true: [14.74077551 22.90183379]  

      * v_ann: [20.258115768432617, 21.30746841430664, 2  

0.773266238582984]  

-----  

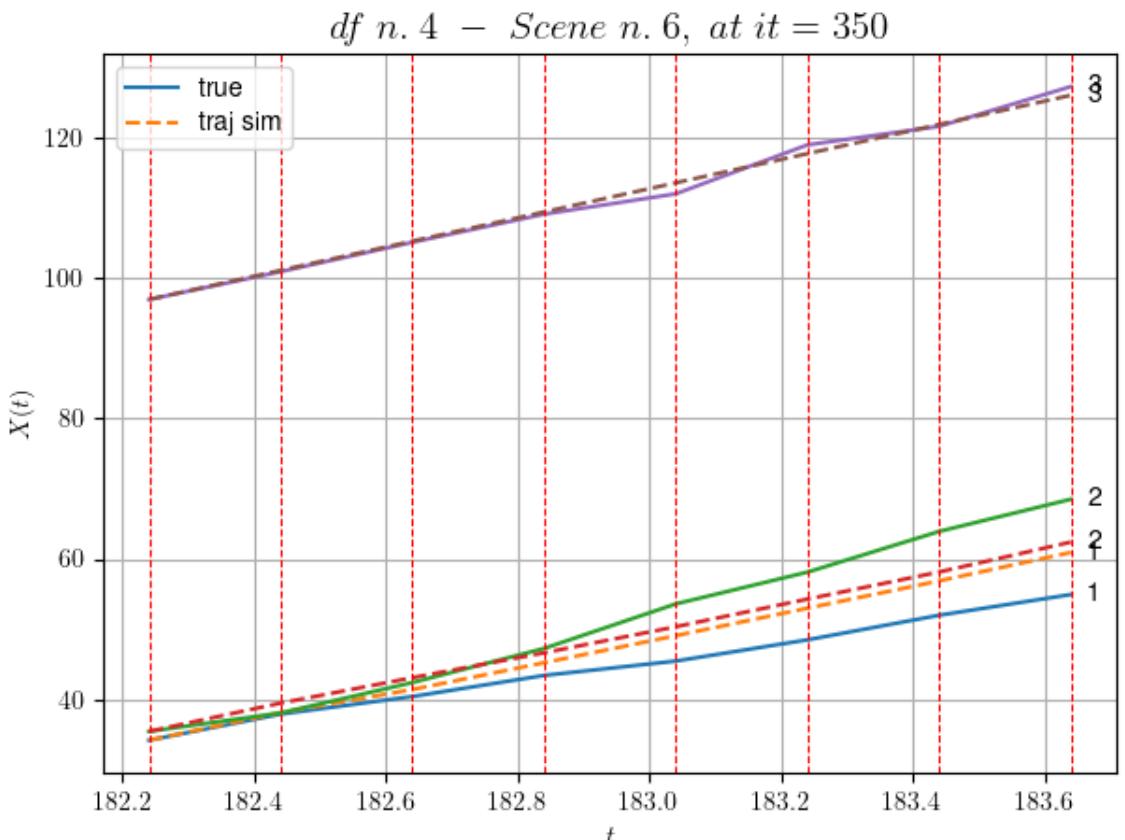
-----  

      * err= 8.418507508181179  

      * Learning rate NN = 0.00012709324073512107  

      * diff = 0.000330046535731654

```



For scene 6/30

```

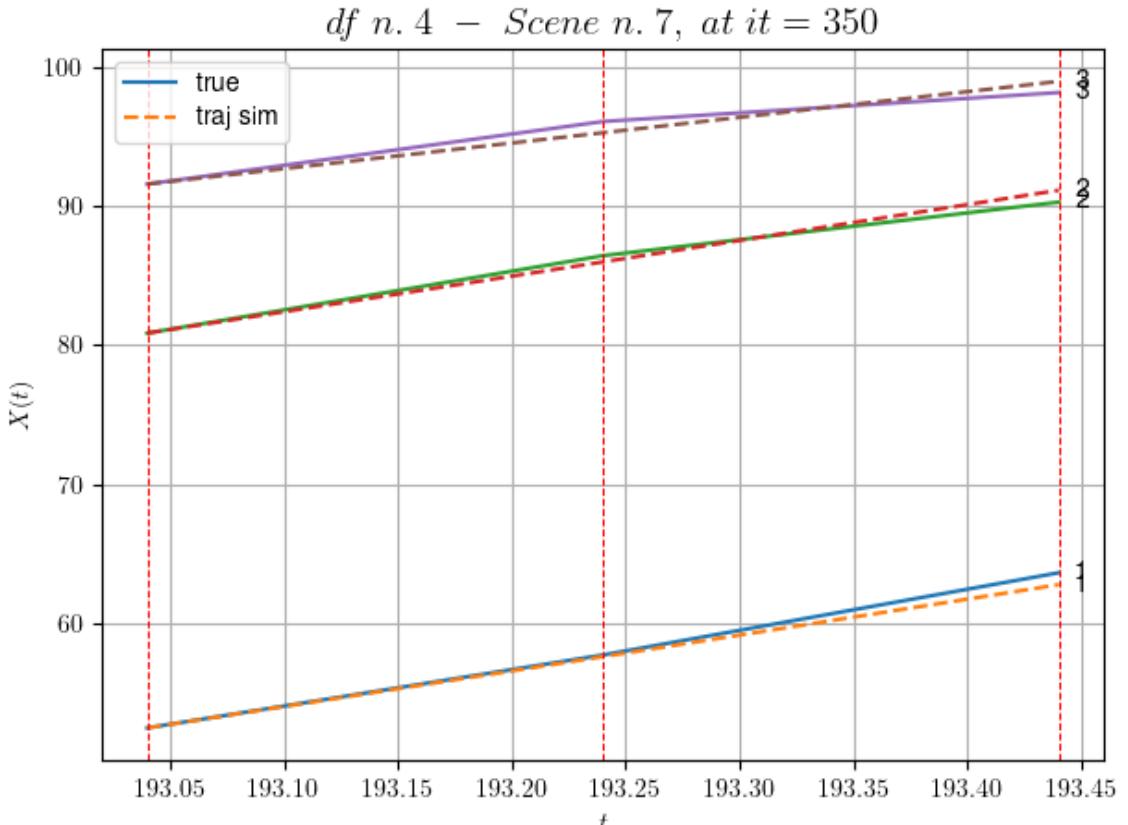
* use LR_NN=0.0005 with err=50.809465854171826 at it=19
* v0_scn_mean = 21.564062237689914
* MAE = 8.342117426090793

```

```
=====
=====
- Time interval n.0: [193.04, 193.24]
  * y_true: [26.28155868 27.90372348]
  * v_ann: [25.67852783203125, 25.668153762817383, 1
8.506611798356342]
```

```
=====
- Time interval n.1: [193.24, 193.44]
  * y_true: [29.63205884 19.30286837]
  * v_ann: [25.933929443359375, 25.82658576965332, 1
8.506611798356342]
```

```
=====
* err= 0.33266835025018177
* Learning rate NN = 7.289998757187277e-05
* diff = 1.536576218537205e-05
```



For scene 7/30

```
* use LR_NN=0.0001 with err=7.294961875030755 at it=19
* v0 scn mean = 19.491676030300034
* MAE = 0.3268317647257801
```

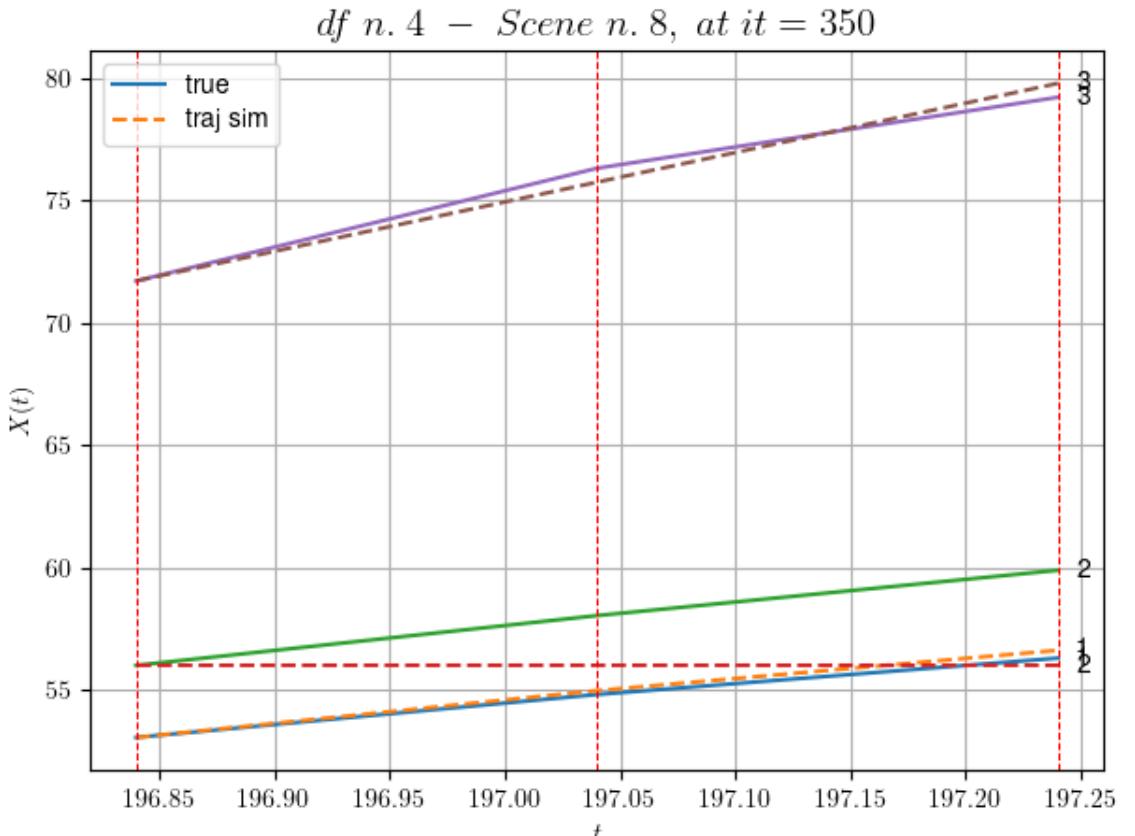
```
=====
=====
- Time interval n.0: [196.84, 197.04]
  * y_true: [ 8.77046468 10.16548364]
  * v_ann: [9.562921524047852, 3.923259080305407e-21,
20.188844124320998]
```

```

- Time interval n.1: [197.04, 197.24]
  * y_true: [7.43042623 9.26246532]
  * v_ann: [8.240025520324707, 4.658481257719436e-26,
20.188844124320998]
```

```

* err= 2.222884135560768
* Learning rate NN = 0.0036449995823204517
* diff = 5.431860987670234e-06
```



For scene 8/30

```

* use LR_NN=0.005 with err=3.1507788534767207 at it=19
* v0_scn_mean = 21.02972921038931
* MAE = 2.222884135560768
```

For scene 9/30

```

* use LR_NN=0.0001 with err=5.404060740914589 at it=19
* v0_scn_mean = 30.094441532938035
* MAE = 30.51618156307838
```

```

- Time interval n.0: [224.84, 225.04]
  * y_true: [17.10046829 25.29311811]
```

```
* v_ann: [19.026439666748047, 19.195287704467773, 1  
5.713780360625558]
```

```
- Time interval n.1: [225.04, 225.24]  
* y_true: [17.70062553 10.9614656 ]  
* v_ann: [19.264522552490234, 19.327985763549805, 1  
5.713780360625558]
```

```
- Time interval n.2: [225.24, 225.44]  
* y_true: [22.57087879 26.33405568]  
* v_ann: [18.715452194213867, 19.062328338623047, 1  
5.713780360625558]
```

```
- Time interval n.3: [225.44, 225.64]  
* y_true: [16.35079439 22.81365517]  
* v_ann: [19.325958251953125, 19.358354568481445, 1  
5.713780360625558]
```

```
- Time interval n.4: [225.64, 225.84]  
* y_true: [20.8811317 16.55300892]  
* v_ann: [19.35280990600586, 19.370594024658203, 1  
5.713780360625558]
```

```
- Time interval n.5: [225.84, 226.04]  
* y_true: [16.52103304 29.98602504]  
* v_ann: [19.280607223510742, 19.33906364440918, 1  
5.713780360625558]
```

```
- Time interval n.6: [226.04, 226.24]  
* y_true: [18.95135857 18.46388585]  
* v_ann: [19.732177734375, 19.517963409423828, 15.7  
13780360625558]
```

```
- Time interval n.7: [226.24, 226.44]  
* y_true: [20.26160248 17.75418412]  
* v_ann: [19.617307662963867, 19.485198974609375, 1  
5.713780360625558]
```

```
- Time interval n.8: [226.44, 226.64]  
* y_true: [16.68150299 14.60353303]  
* v_ann: [19.547544479370117, 19.454383850097656, 1  
5.713780360625558]
```

```

-----  

    - Time interval n.9: [226.64, 226.84]  

      * y_true: [22.62228992 25.47686963]  

      * v_ann: [19.107196807861328, 19.273277282714844, 1  

5.713780360625558]

```

```

-----  

    - Time interval n.10: [226.84, 227.04]  

      * y_true: [22.04244959 23.58655245]  

      * v_ann: [19.666515350341797, 19.5046443939209, 15.  

713780360625558]

```

```

-----  

    - Time interval n.11: [227.04, 227.24]  

      * y_true: [12.37151499 9.65291202]  

      * v_ann: [20.044191360473633, 19.566890716552734, 1  

5.713780360625558]

```

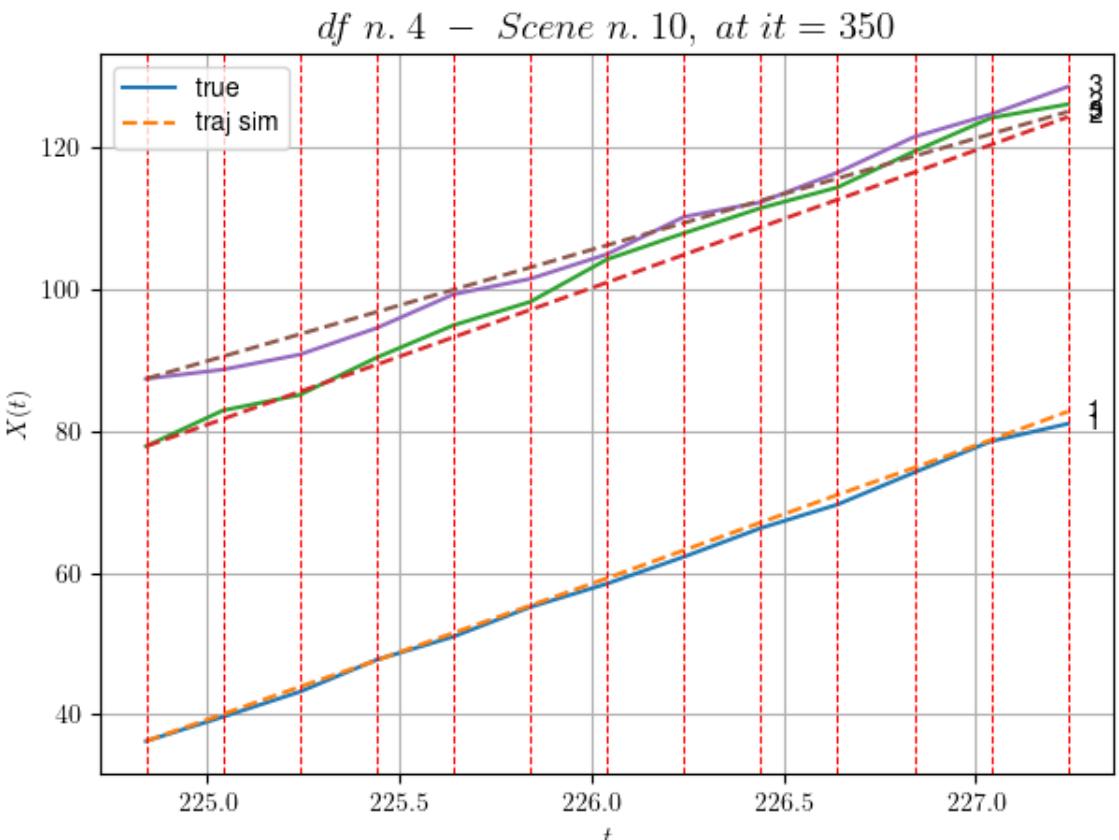
```

* err= 3.137702952752335  

* Learning rate NN = 4.431466732057743e-05  

* diff = 0.000024107220176077724

```



For scene 10/30

```

* use LR_NN=0.0005 with err=297.7317018403666 at it=19  

* v0_scn_mean = 16.938209896071562  

* MAE = 3.1365387236851046

```

```
- Time interval n.0: [230.84, 231.04]
  * y_true: [ 5.64695095 17.97864337]
  * v_ann: [11.856456756591797, 14.060428619384766, 2
3.322771251469145]

-----
- Time interval n.1: [231.04, 231.24]
  * y_true: [ 5.72513489 21.19066695]
  * v_ann: [14.189878463745117, 13.741402626037598, 2
3.322771251469145]

-----
- Time interval n.2: [231.24, 231.44]
  * y_true: [ 6.01015392 28.29114422]
  * v_ann: [14.08372974395752, 13.634557723999023, 2
3.322771251469145]

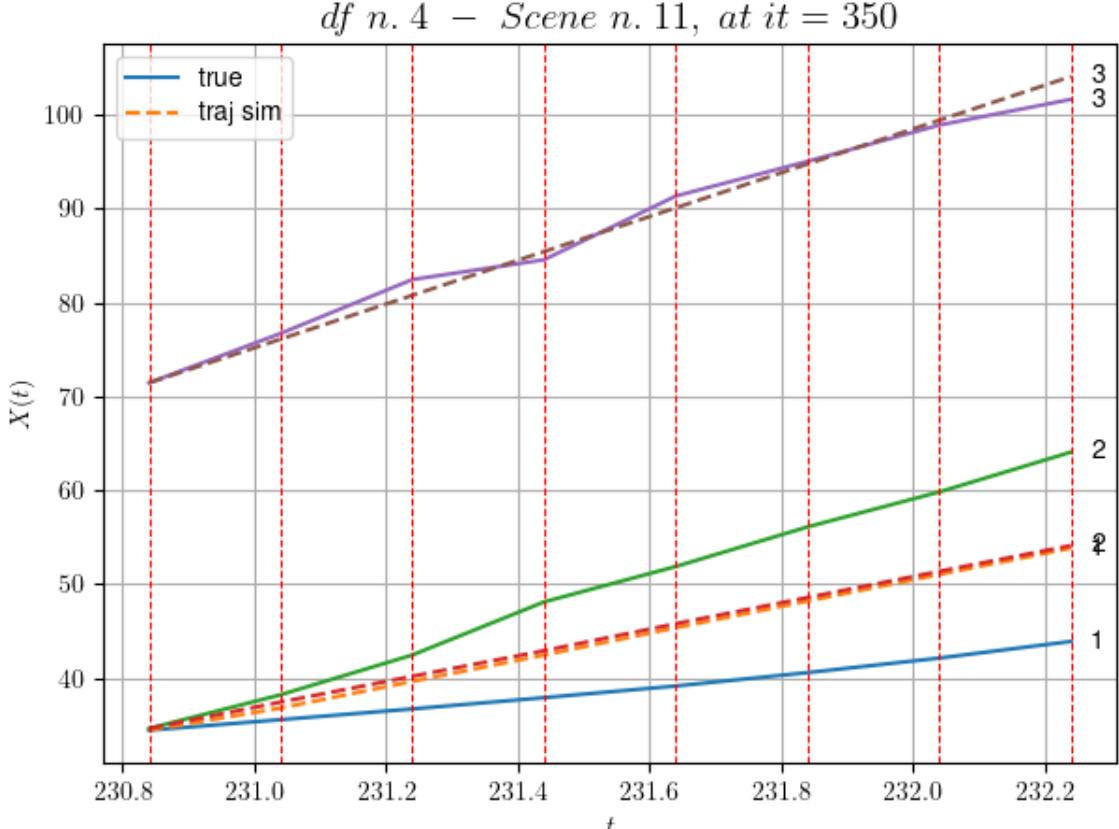
-----
- Time interval n.3: [231.44, 231.64]
  * y_true: [ 6.20016661 18.85086271]
  * v_ann: [14.516298294067383, 14.379650115966797, 2
3.322771251469145]

-----
- Time interval n.4: [231.64, 231.84]
  * y_true: [ 7.13021091 21.11121983]
  * v_ann: [14.20184326171875, 13.940411567687988, 2
3.322771251469145]

-----
- Time interval n.5: [231.84, 232.04]
  * y_true: [ 7.75024044 18.61116554]
  * v_ann: [14.185439109802246, 13.963852882385254, 2
3.322771251469145]

-----
- Time interval n.6: [232.04, 232.24]
  * y_true: [ 8.87530762 21.24160102]
  * v_ann: [14.011968612670898, 13.76008129119873, 2
3.322771251469145]

-----
* err= 25.639787923049678
* Learning rate NN = 0.00012709324073512107
* diff = 0.00033279934427099533
```



For scene 11/30

\* use LR\_NN=0.0005 with err=20.665587220634137 at it=19  
 \* v0\_scn\_mean = 23.895056733633968  
 \* MAE = 25.600795319914297

- 
- 
- Time interval n.0: [233.84, 234.04]
    - \* y\_true: [14.14101026 12.7012637 ]
    - \* v\_ann: [21.418004989624023, 21.898347854614258, 2 1.46286816031569]

---

  - Time interval n.1: [234.04, 234.24]
    - \* y\_true: [26.43219185 20.11227439]
    - \* v\_ann: [19.904781341552734, 19.822917938232422, 2 1.46286816031569]

---

  - Time interval n.2: [234.24, 234.44]
    - \* y\_true: [22.40209801 33.22429882]
    - \* v\_ann: [20.49079704284668, 20.668676376342773, 2 1.46286816031569]

---

  - Time interval n.3: [234.44, 234.64]
    - \* y\_true: [ 7.15071478 24.83361026]
    - \* v\_ann: [21.83941650390625, 22.484018325805664, 2 1.46286816031569]

1.46286816031569]

```
- Time interval n.4: [234.64, 234.84]
  * y_true: [26.44301464 23.06377261]
  * v_ann: [20.683839797973633, 20.80460548400879, 2
```

1.46286816031569]

```
- Time interval n.5: [234.84, 235.04]
  * y_true: [27.303494 31.34578132]
  * v_ann: [21.48848533630371, 21.782041549682617, 2
```

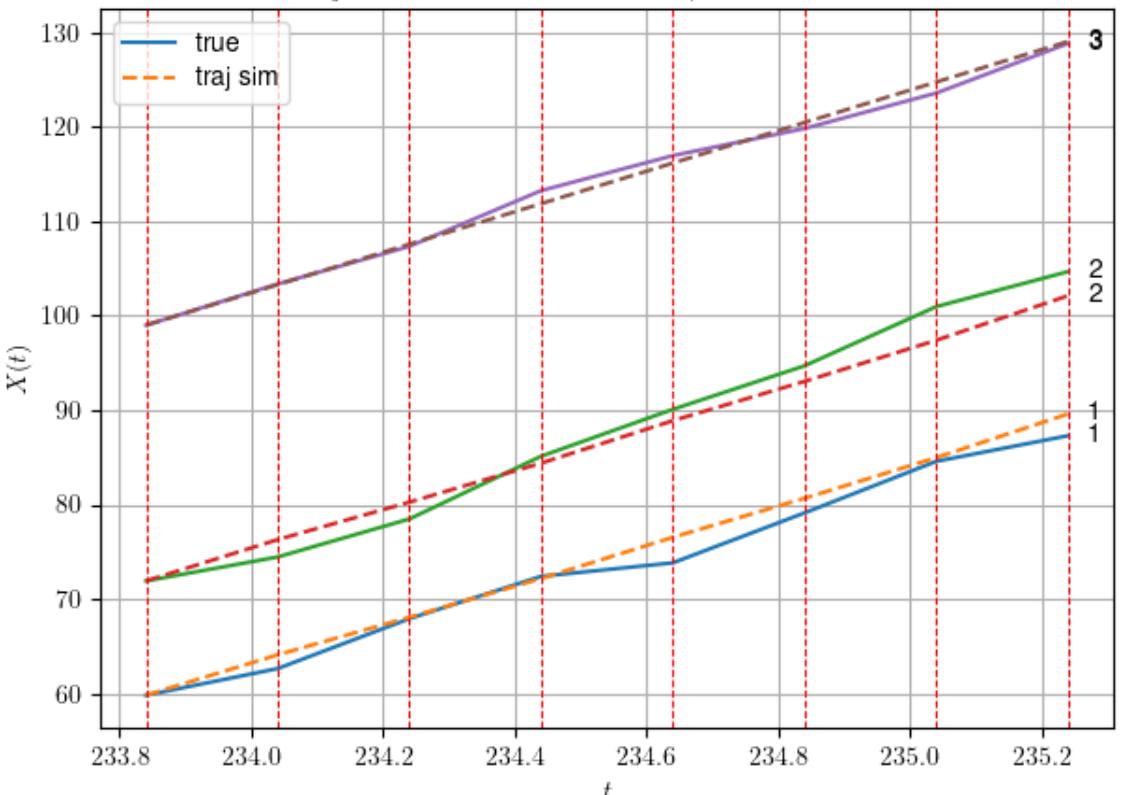
1.46286816031569]

```
- Time interval n.6: [235.04, 235.24]
  * y_true: [13.58189317 18.51369375]
  * v_ann: [23.141138076782227, 23.572425842285156, 2
```

1.46286816031569]

```
* err= 2.1766129215242893
* Learning rate NN = 0.00012709324073512107
* diff = 0.0017530857872460892
```

*df n. 4 – Scene n. 12, at it = 350*



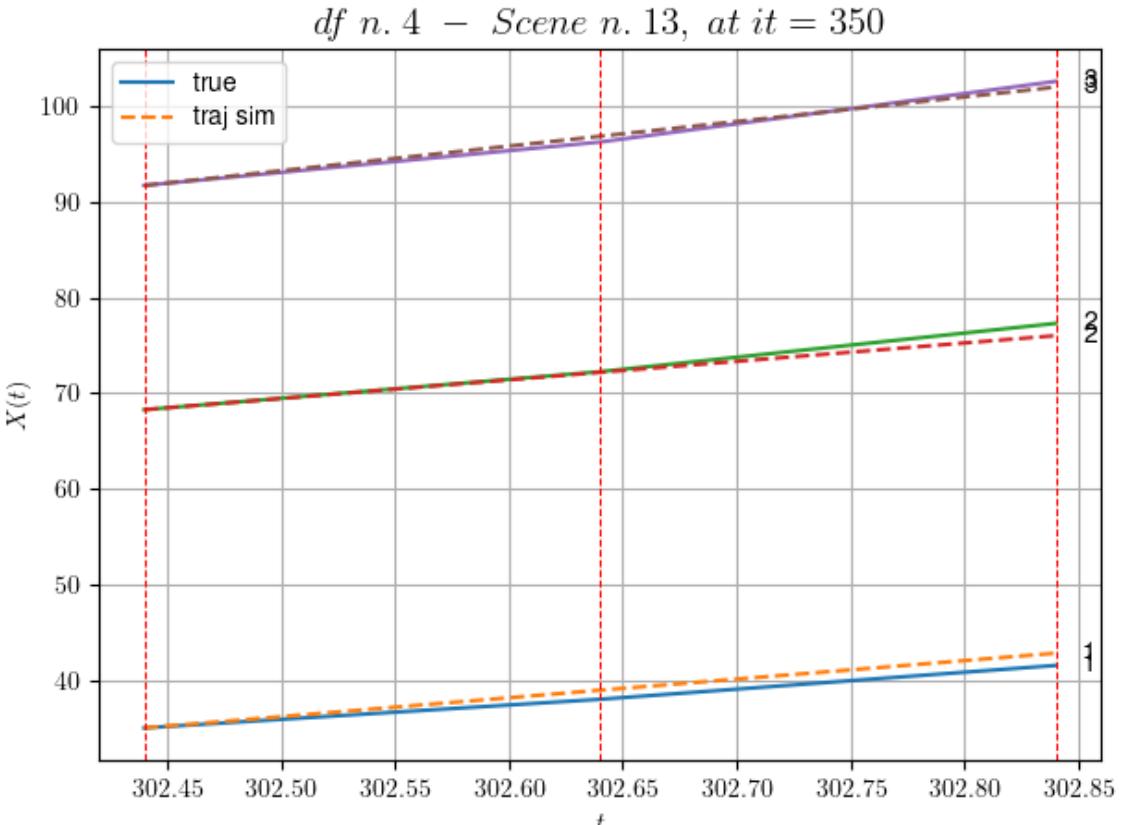
For scene 12/30

```
* use LR_NN=0.0005 with err=35.09454349695392 at it=19
* v0_scn_mean = 22.194560422955675
* MAE = 2.1568107489778696
```

```
=====
=====
- Time interval n.0: [302.44, 302.64]
  * y_true: [15.00036276 19.90190261]
  * v_ann: [19.756567001342773, 19.552919387817383, 2
5.744568982281763]
```

```
=====
- Time interval n.1: [302.64, 302.84]
  * y_true: [17.72492583 25.30273749]
  * v_ann: [19.376846313476562, 19.23517417907715, 2
5.744568982281763]
```

```
* err= 0.5471495441314711
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0005236081416472027
```



For scene 13/30

```
* use LR_NN=0.0001 with err=2.106106461231638 at it=19
* v0 scn mean = 26.10928936007713
* MAE = 0.5093024387759266
```

```
=====
=====
- Time interval n.0: [364.64, 364.84]
  * y_true: [23.68175628 20.26218764]
  * v_ann: [18.190343856811523, 19.289077758789062, 2
8.205737859029586]
```

```

-----  

-----  

    - Time interval n.1: [364.84, 365.04]  

      * y_true: [20.38169455 13.81168669]  

      * v_ann: [19.22191619873047, 19.91887092590332, 28.  

205737859029586]  

-----  

-----
```

```

-----  

-----  

    - Time interval n.2: [365.04, 365.24]  

      * y_true: [10.17092159 27.1635357 ]  

      * v_ann: [19.100807189941406, 17.894515991210938, 2  

8.205737859029586]  

-----  

-----
```

```

-----  

-----  

    - Time interval n.3: [365.24, 365.44]  

      * y_true: [18.57186597 15.36227914]  

      * v_ann: [17.904205322265625, 17.78858757019043, 2  

8.205737859029586]  

-----  

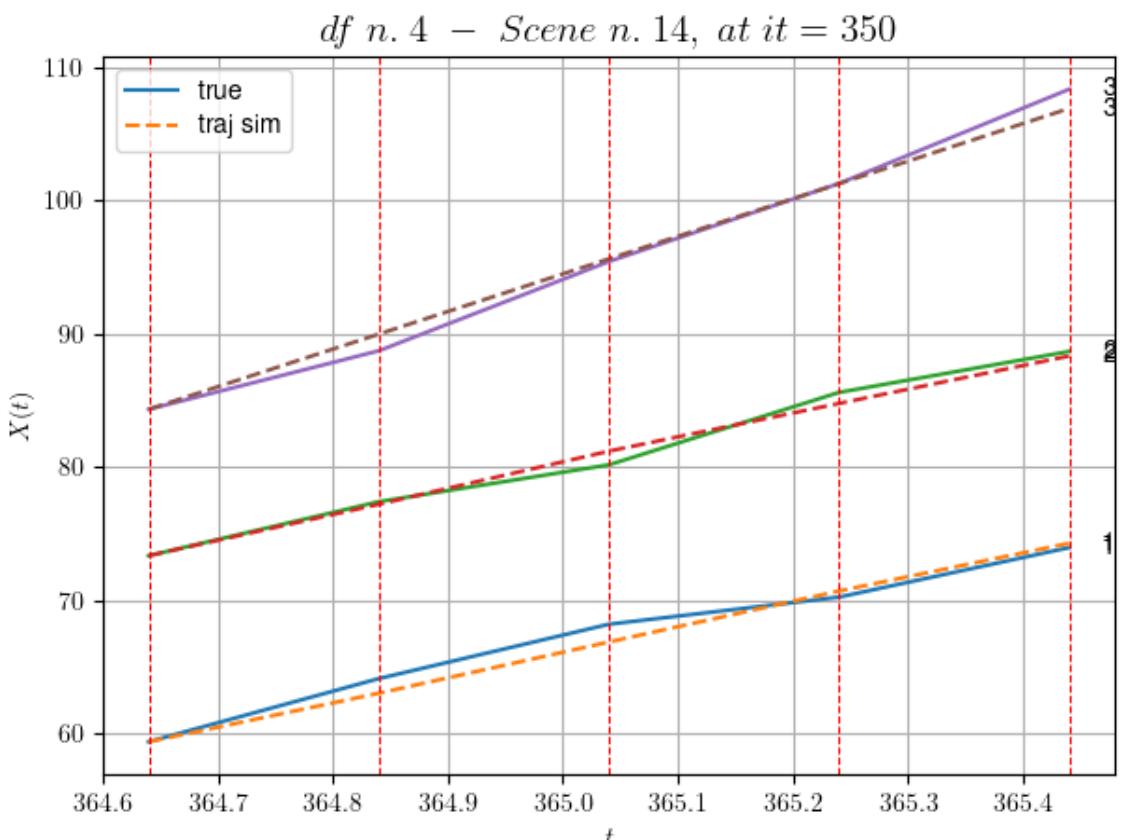
-----
```

```

* err= 0.5908105458717248  

* Learning rate NN = 0.000239148415857926  

* diff = 5.0681289672227514e-05
```



For scene 14/30

```

* use LR_NN=0.0005 with err=1.2716943511598782 at it=19
* v0_scn_mean = 28.35951874824957
* MAE = 0.563346359080449
```

```
=====
- Time interval n.0: [422.64, 422.84]
  * y_true: [18.36052369 19.91162557]
  * v_ann: [25.10344696044922, 24.685733795166016, 2
7.545107346546942]

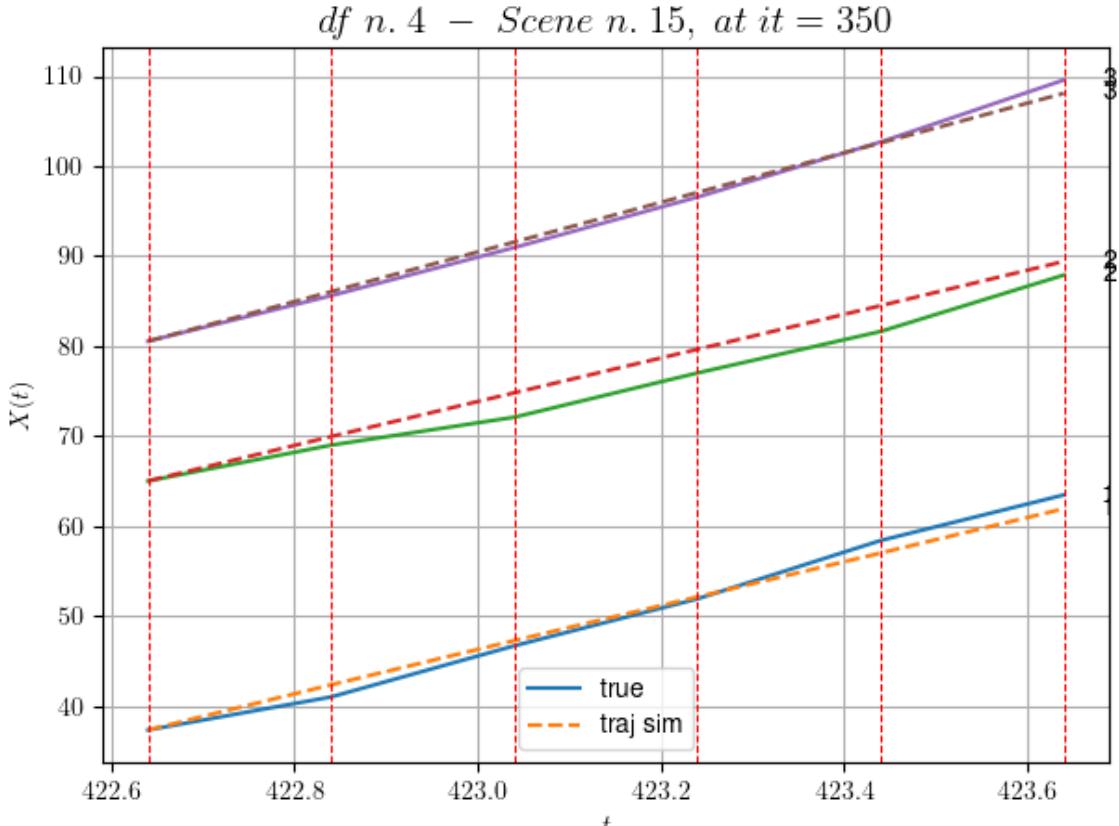
-----
- Time interval n.1: [422.84, 423.04]
  * y_true: [28.40107569 15.51150308]
  * v_ann: [24.558748245239258, 24.300617218017578, 2
7.545107346546942]

-----
- Time interval n.2: [423.04, 423.24]
  * y_true: [26.09121176 24.58263804]
  * v_ann: [24.274093627929688, 24.15873146057129, 2
7.545107346546942]

-----
- Time interval n.3: [423.24, 423.44]
  * y_true: [32.41191994 23.07275882]
  * v_ann: [24.368350982666016, 24.25809097290039, 2
7.545107346546942]

-----
- Time interval n.4: [423.44, 423.64]
  * y_true: [25.31178577 31.31439465]
  * v_ann: [24.627296447753906, 24.56878662109375, 2
7.545107346546942]

-----
* err= 1.9552129901632753
* Learning rate NN = 3.874203684972599e-05
* diff = 0.0018528289699570877
```



For scene 15/30

\* use LR\_NN=0.0001 with err=3.109979989133881 at it=19  
 \* v0\_scn\_mean = 27.755508918629264  
 \* MAE = 1.9552129901632753

---



---

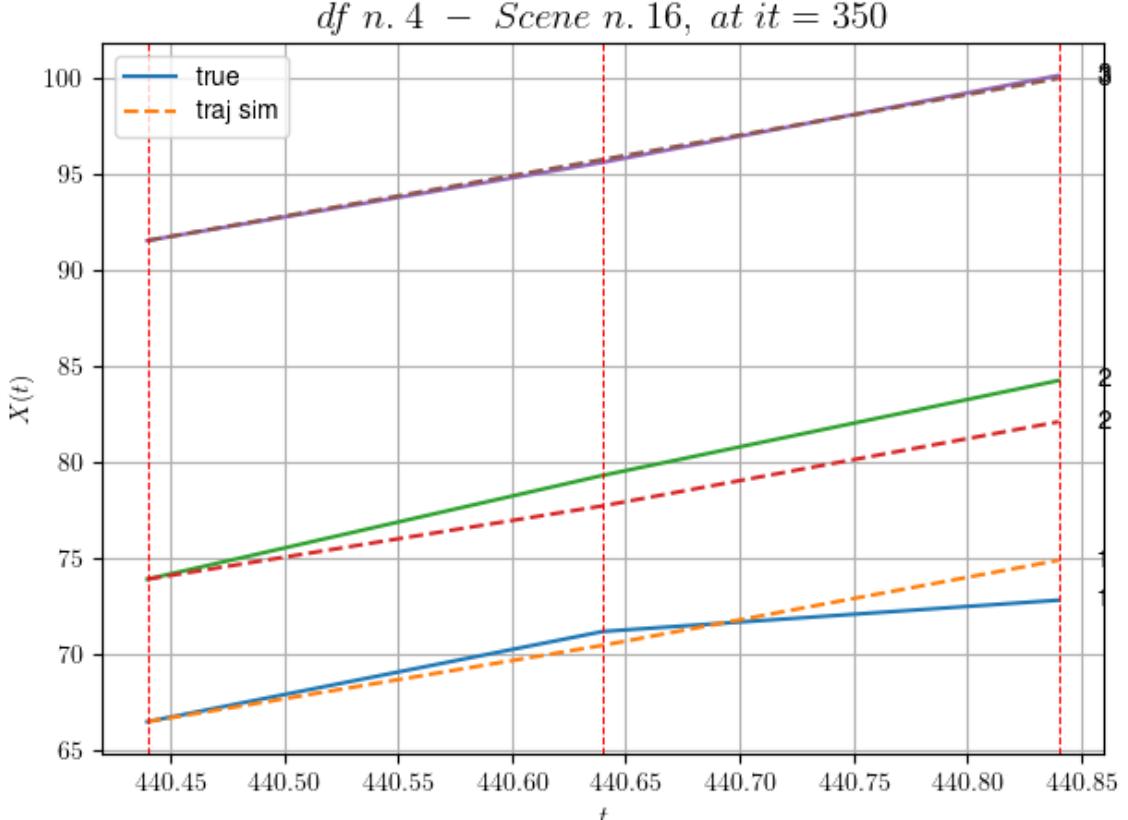
- Time interval n.0: [440.44, 440.64]  
 \* y\_true: [23.50209477 27.05306951]  
 \* v\_ann: [19.89450454711914, 19.115615844726562, 2  
 1.12705861242083]

---

- Time interval n.1: [440.64, 440.84]  
 \* y\_true: [ 8.15079495 24.70319187]  
 \* v\_ann: [22.153898239135742, 21.88751792907715, 2  
 1.12705861242083]

---

\* err= 1.3371107844216799  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.0005966117736357912



For scene 16/30

- \* use LR\_NN=0.0005 with err=2.8325475368605257 at it=19
- \* v0\_scn\_mean = 21.88753211594219
- \* MAE = 1.3371107844216799

---



---

- Time interval n.0: [459.64, 459.84]
  - \* y\_true: [ 8.02057991 18.30147717]
  - \* v\_ann: [16.668907165527344, 19.366756439208984, 2 1.749537222116768]
  
- Time interval n.1: [459.84, 460.04]
  - \* y\_true: [15.90126261 32.50305135]
  - \* v\_ann: [17.086626052856445, 19.39788246154785, 2 1.749537222116768]
  
- Time interval n.2: [460.04, 460.24]
  - \* y\_true: [12.56106954 7.60079575]
  - \* v\_ann: [18.42960548400879, 18.300676345825195, 2 1.749537222116768]
  
- Time interval n.3: [460.24, 460.44]
  - \* y\_true: [22.47215871 13.7515264 ]
  - \* v\_ann: [17.693098068237305, 19.394624710083008, 2

1.749537222116768]

---

- Time interval n.4: [460.44, 460.64]
  - \* y\_true: [12.66130245 40.10510628]
  - \* v\_ann: [17.13008689880371, 20.777713775634766, 2

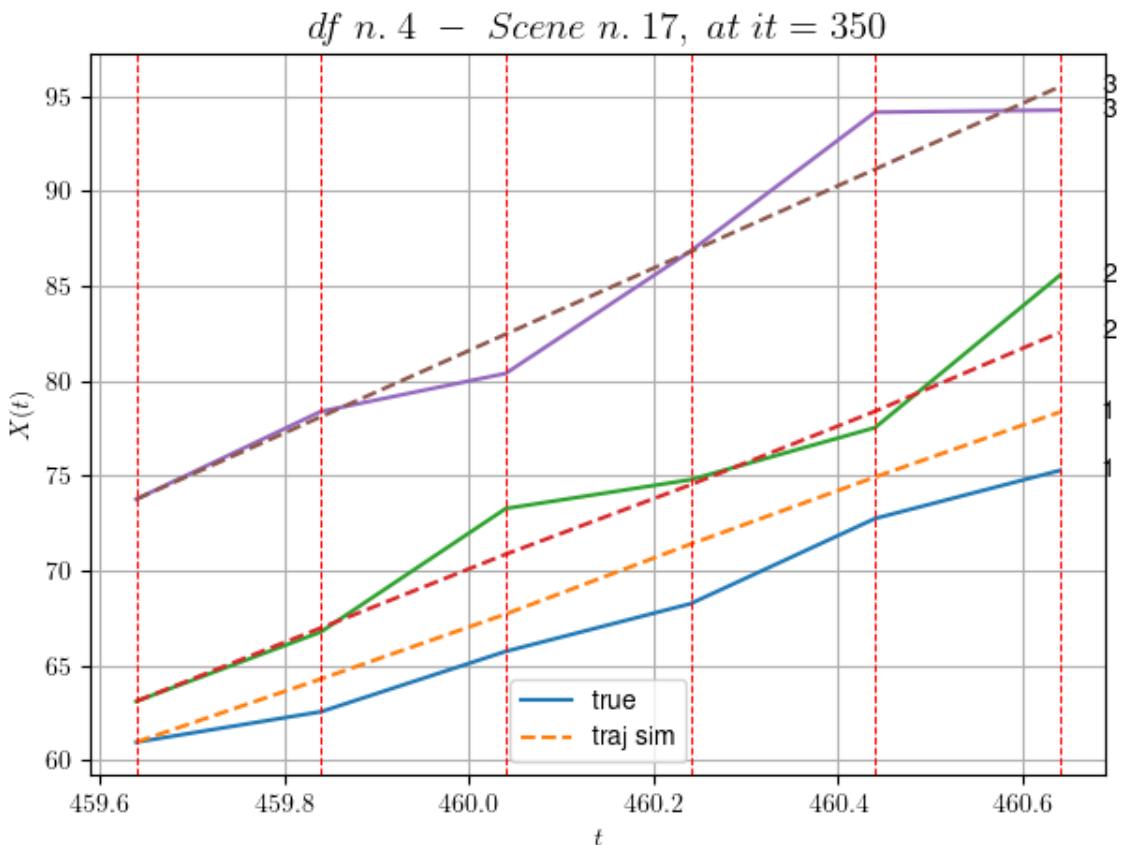
1.749537222116768]

---



---

- \* err= 3.420296819760638
- \* Learning rate NN = 3.874203684972599e-05
- \* diff = 0.008240280261687438



For scene 17/30

- \* use LR\_NN=0.0001 with err=11.822932477373245 at it=19
- \* v0\_scn\_mean = 22.456659929267406
- \* MAE = 3.420296819760638

---



---



---



---

- Time interval n.0: [493.84, 494.04]
  - \* y\_true: [22.94003108 21.75102788]
  - \* v\_ann: [22.790802001953125, 22.953325271606445, 2

0.437010740210074]

---



---



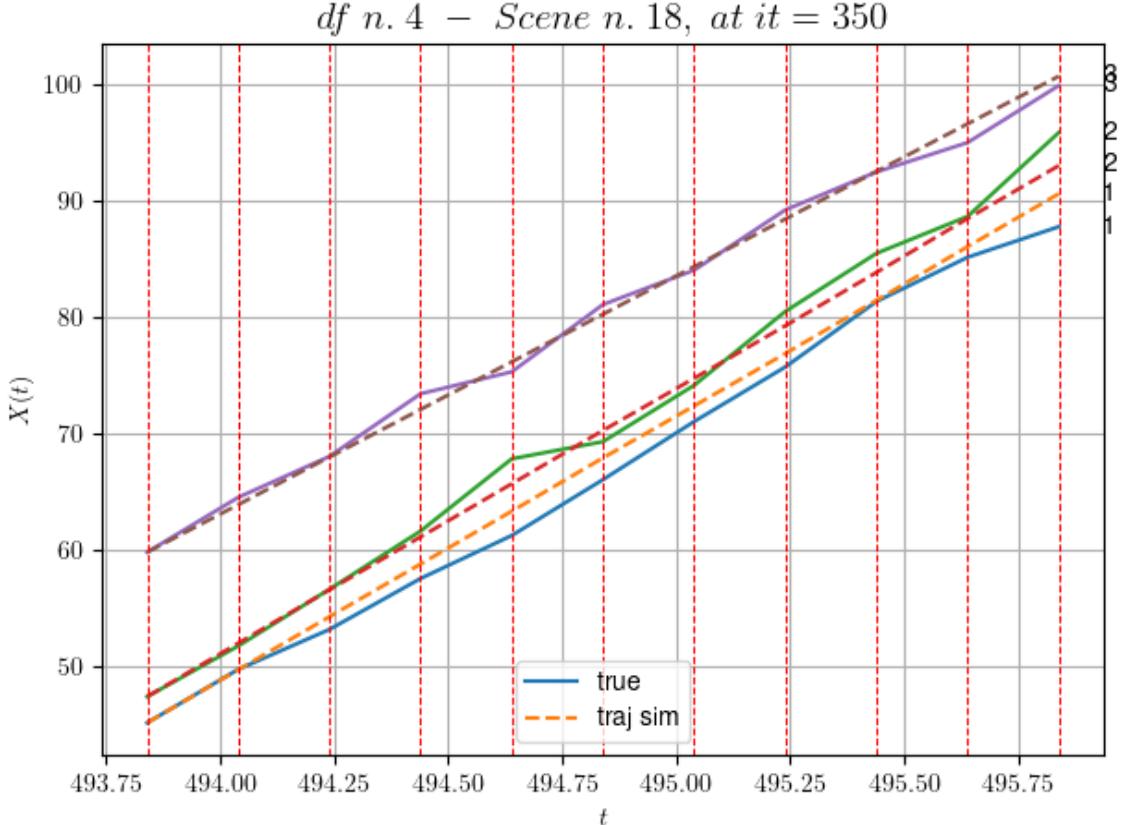
---

- Time interval n.1: [494.04, 494.24]
  - \* y\_true: [17.14085991 24.35137427]
  - \* v\_ann: [22.75130844116211, 22.91646385192871, 20.

437010740210074]

```
-----  
-----  
    - Time interval n.2: [494.24, 494.44]  
      * y_true: [21.88131212 25.00167951]  
      * v_ann: [22.62896156311035, 22.732147216796875, 2  
0.437010740210074]  
  
-----  
-----  
    - Time interval n.3: [494.44, 494.64]  
      * y_true: [18.45125037 31.00249487]  
      * v_ann: [22.68998908996582, 22.79632568359375, 20.  
437010740210074]  
  
-----  
-----  
    - Time interval n.4: [494.64, 494.84]  
      * y_true: [23.98189292 7.35066295]  
      * v_ann: [22.86939239501953, 22.88365364074707, 20.  
437010740210074]  
  
-----  
-----  
    - Time interval n.5: [494.84, 495.04]  
      * y_true: [24.94226236 24.20238954]  
      * v_ann: [22.320533752441406, 22.3933162689209, 20.  
437010740210074]  
  
-----  
-----  
    - Time interval n.6: [495.04, 495.24]  
      * y_true: [23.43243252 31.70363737]  
      * v_ann: [22.470928192138672, 22.544958114624023, 2  
0.437010740210074]  
  
-----  
-----  
    - Time interval n.7: [495.24, 495.44]  
      * y_true: [28.10335872 24.95329593]  
      * v_ann: [22.841835021972656, 22.9042911529541, 20.  
437010740210074]  
  
-----  
-----  
    - Time interval n.8: [495.44, 495.64]  
      * y_true: [18.99250639 15.85230368]  
      * v_ann: [23.086048126220703, 23.141937255859375, 2  
0.437010740210074]  
  
-----  
-----  
    - Time interval n.9: [495.64, 495.84]  
      * y_true: [13.12188353 36.00587838]  
      * v_ann: [22.684946060180664, 22.72641372680664, 2  
0.437010740210074]  
  
-----  
-----  
      * err= 1.4726617091535932
```

\* Learning rate NN = 6.754255446139723e-05  
 \* diff = 0.001142709025754307



For scene 18/30

\* use LR\_NN=0.0005 with err=92.34477263383586 at it=19  
 \* v0\_scn\_mean = 21.25662620129172  
 \* MAE = 1.4726617091535932

- 
- 
- Time interval n.0: [520.04, 520.24]
    - \* y\_true: [17.72000935 17.53021327]
    - \* v\_ann: [20.777868270874023, 21.050907135009766, 25.962836499253886]

---

  - Time interval n.1: [520.24, 520.44]
    - \* y\_true: [21.19003079 20.68032877]
    - \* v\_ann: [20.707231521606445, 20.971569061279297, 25.962836499253886]

---

  - Time interval n.2: [520.44, 520.64]
    - \* y\_true: [20.95006602 20.21041565]
    - \* v\_ann: [20.70755386352539, 20.97283172607422, 25.962836499253886]

---

  - Time interval n.3: [520.64, 520.84]

```
* y_true: [19.83010584 22.72061589]
* v_ann: [20.69972801208496, 20.988630294799805, 2
5.962836499253886]

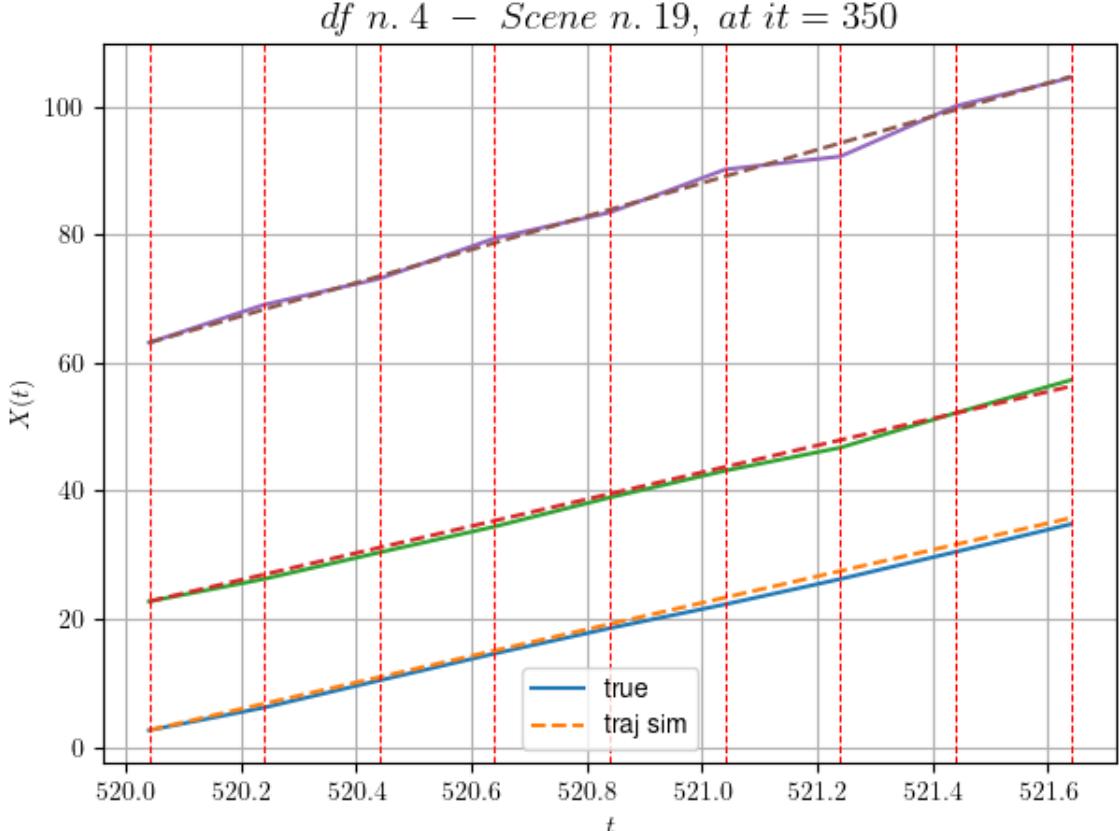
-----
- Time interval n.4: [520.84, 521.04]
* y_true: [18.57015207 20.87066157]
* v_ann: [20.715208053588867, 20.997024536132812, 2
5.962836499253886]

-----
- Time interval n.5: [521.04, 521.24]
* y_true: [19.76022757 18.03074501]
* v_ann: [20.694536209106445, 20.982215881347656, 2
5.962836499253886]

-----
- Time interval n.6: [521.24, 521.44]
* y_true: [21.18033214 27.03127071]
* v_ann: [20.645944595336914, 20.889554977416992, 2
5.962836499253886]

-----
- Time interval n.7: [521.44, 521.64]
* y_true: [21.65044512 25.69152055]
* v_ann: [20.73358154296875, 21.04123878479004, 25.
962836499253886]

-----
* err= 0.6827832090860029
* Learning rate NN = 1.029455233947374e-05
* diff = 0.00021002200117017052
```



For scene 19/30

\* use LR\_NN=5e-05 with err=30.963372508130078 at it=19  
 \* v0\_scn\_mean = 26.30884981519902  
 \* MAE = 0.6827832090860029

---



---

- Time interval n.0: [550.44, 550.64]  
 \* y\_true: [23.95217582 22.66294351]  
 \* v\_ann: [23.63493537902832, 23.531497955322266, 2  
 0.148468822561938]

---

- Time interval n.1: [550.64, 550.84]  
 \* y\_true: [22.2022957 28.49416646]  
 \* v\_ann: [23.544227600097656, 23.456016540527344, 2  
 0.148468822561938]

---

- Time interval n.2: [550.84, 551.04]  
 \* y\_true: [19.80228834 20.61332089]  
 \* v\_ann: [24.147533416748047, 23.88067054748535, 2  
 0.148468822561938]

---

- Time interval n.3: [551.04, 551.24]  
 \* y\_true: [31.50413614 18.88333685]  
 \* v\_ann: [22.96744155883789, 22.903614044189453, 2

0.148468822561938]

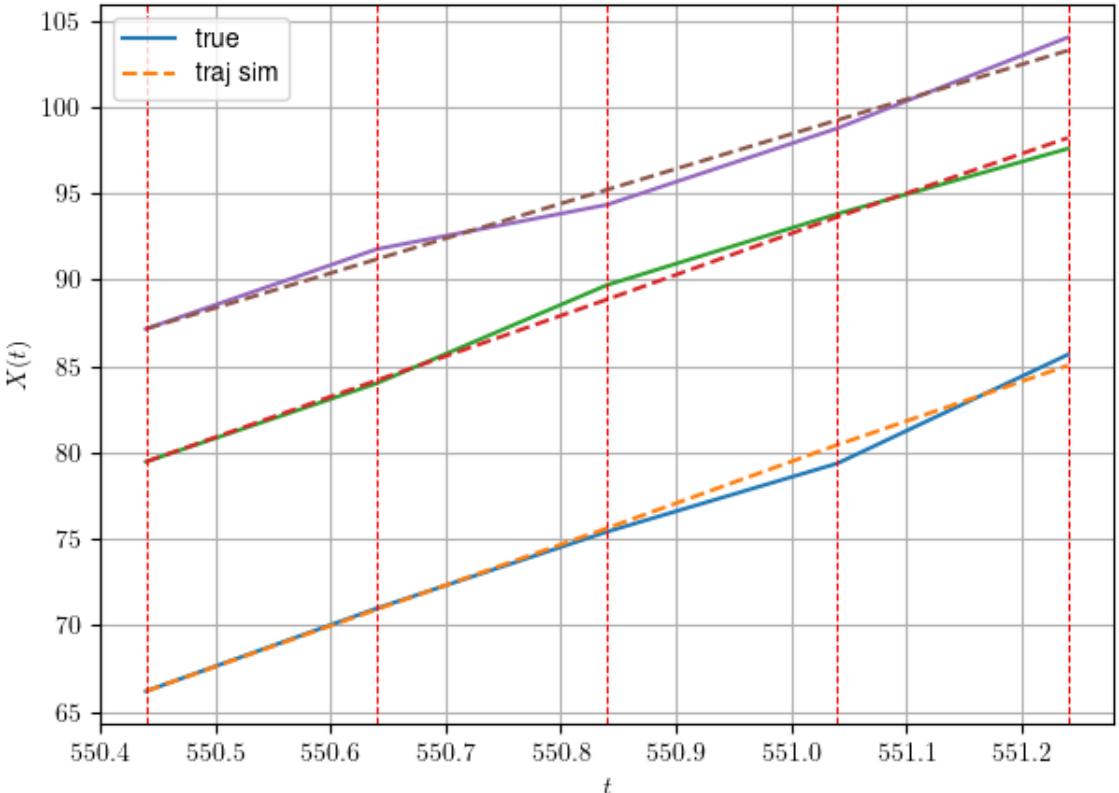
---



---

- \* err= 0.3102136640491268
- \* Learning rate NN = 0.000239148415857926
- \* diff = 8.979684930632281e-06

*df n. 4 – Scene n. 20, at it = 350*



For scene 20/30

- \* use LR\_NN=0.0005 with err=16.73555403365511 at it=19
- \* v0\_scn\_mean = 20.99281435605698
- \* MAE = 0.3102136640491268

---



---

- Time interval n.0: [554.64, 554.84]
- \* y\_true: [16.3871362 34.43556815]
- \* v\_ann: [23.503236770629883, 23.316654205322266, 2

0.440796892460902]

---



---

- Time interval n.1: [554.84, 555.04]
- \* y\_true: [19.58824641 23.53414882]
- \* v\_ann: [23.563745498657227, 23.54641342163086, 2

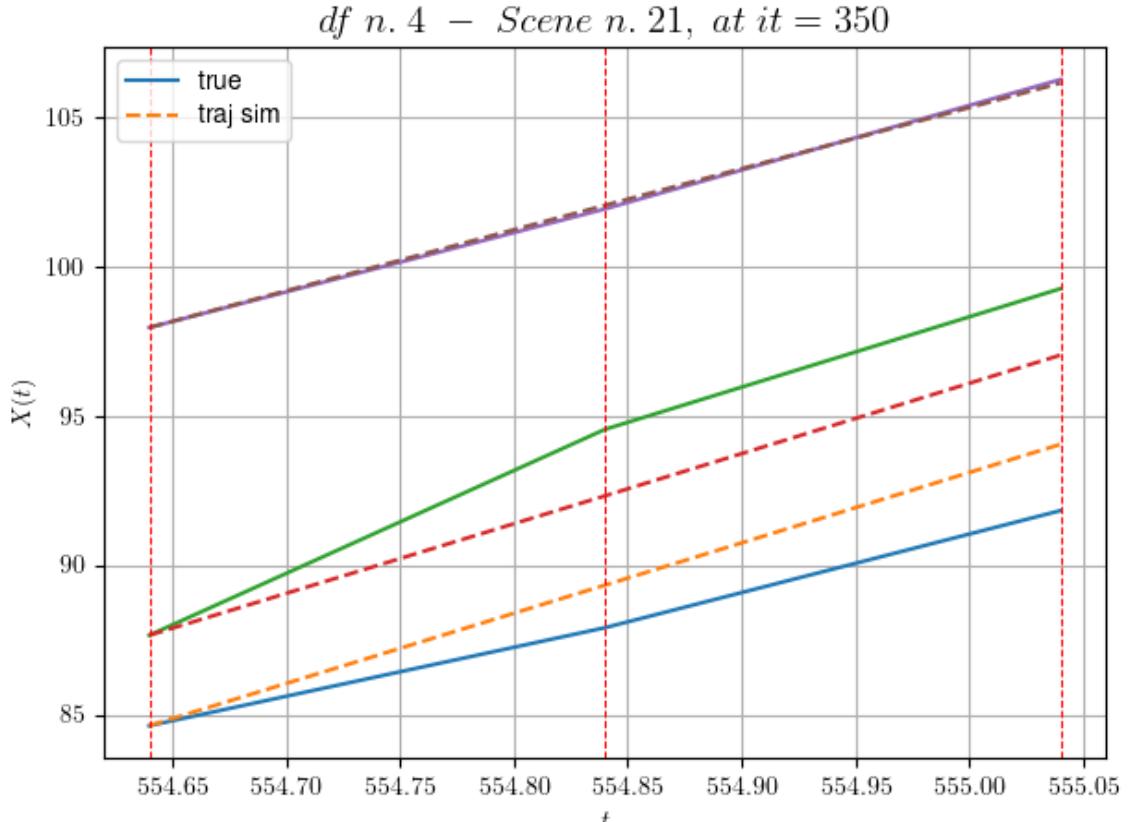
0.440796892460902]

---



---

- \* err= 1.8728309061102852
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.0008012637160335068



For scene 21/30

- \* use LR\_NN=0.0001 with err=11.057749594205353 at it=19
- \* v0\_scn\_mean = 21.260087853656678
- \* MAE = 1.8411562099496452

---



---

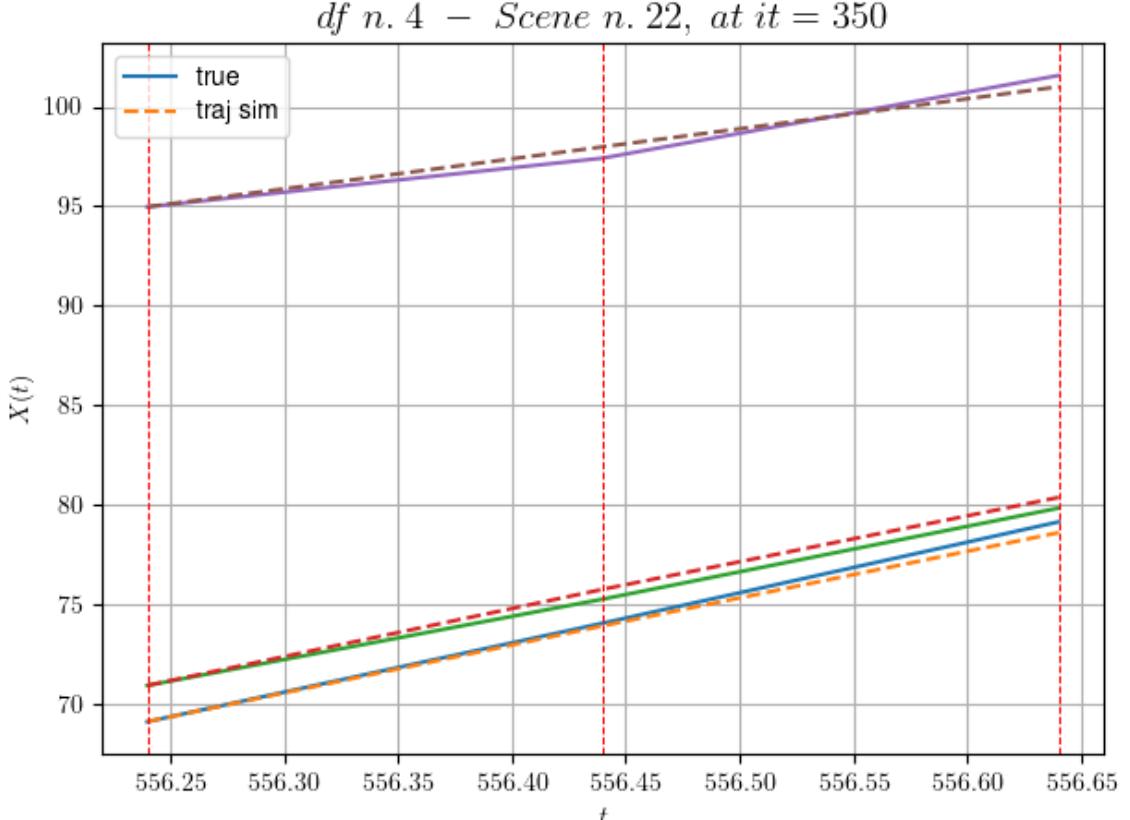
- Time interval n.0: [556.24, 556.44]
- \* y\_true: [24.75252122 21.70224237]
- \* v\_ann: [24.0706787109375, 24.164358139038086, 15.086200202024663]

---

- Time interval n.1: [556.44, 556.64]
- \* y\_true: [25.4427559 22.85265518]
- \* v\_ann: [23.420764923095703, 23.07245445251465, 15.086200202024663]

---

- \* err= 0.16485297403537616
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 1.024682347916528e-06



For scene 22/30

\* use LR\_NN=0.001 with err=15.164591399885024 at it=19  
 \* v0\_scn\_mean = 16.364417772475882  
 \* MAE = 0.15949079451123174

---



---

- Time interval n.0: [575.04, 575.24]  
 \* y\_true: [25.50060057 18.90068968]  
 \* v\_ann: [21.19577407836914, 21.448888778686523, 2  
 4.545660919824957]

---

- Time interval n.1: [575.24, 575.44]  
 \* y\_true: [27.95087423 28.65128625]  
 \* v\_ann: [21.49623680114746, 22.442733764648438, 2  
 4.545660919824957]

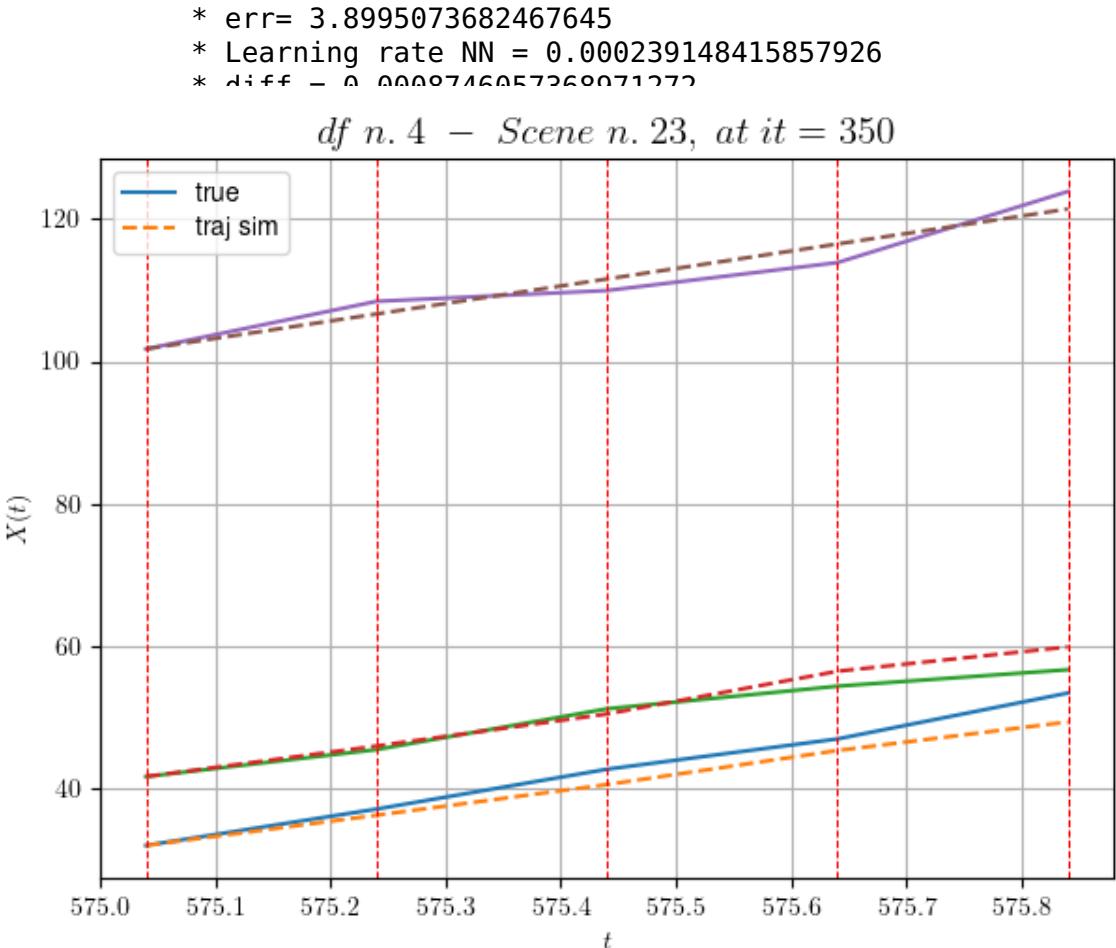
---

- Time interval n.2: [575.44, 575.64]  
 \* y\_true: [21.25083564 15.85084753]  
 \* v\_ann: [23.88385009765625, 29.980316162109375, 2  
 4.545660919824957]

---

- Time interval n.3: [575.64, 575.84]  
 \* y\_true: [32.20158375 11.5506833 ]  
 \* v\_ann: [20.05497932434082, 17.074172973632812, 2

4.545660919824957]



For scene 23/30

```

* use LR_NN=0.0005 with err=46.13898781192979 at it=19
* v0_scn_mean = 25.013136153629997
* MAE = 2.014003601704452

```

---



---



---



---

```

- Time interval n.0: [313.84, 314.04]
* y_true: [15.70108851 23.28855659 11.30165534]
* v_ann: [24.635507583618164, 25.200607299804688, 2
5.360374450683594, 26.41603907656736]

```

---



---



---



---

```

- Time interval n.1: [314.04, 314.24]
* y_true: [25.15198981 24.43240479 30.10483754]
* v_ann: [24.051023483276367, 24.195650100708008, 2
4.310794830322266, 26.41603907656736]

```

---



---



---



---

```

- Time interval n.2: [314.24, 314.44]
* y_true: [27.30252596 23.75264682 40.35752125]
* v_ann: [24.226755142211914, 24.473417282104492, 2
4.61129379272461, 26.41603907656736]

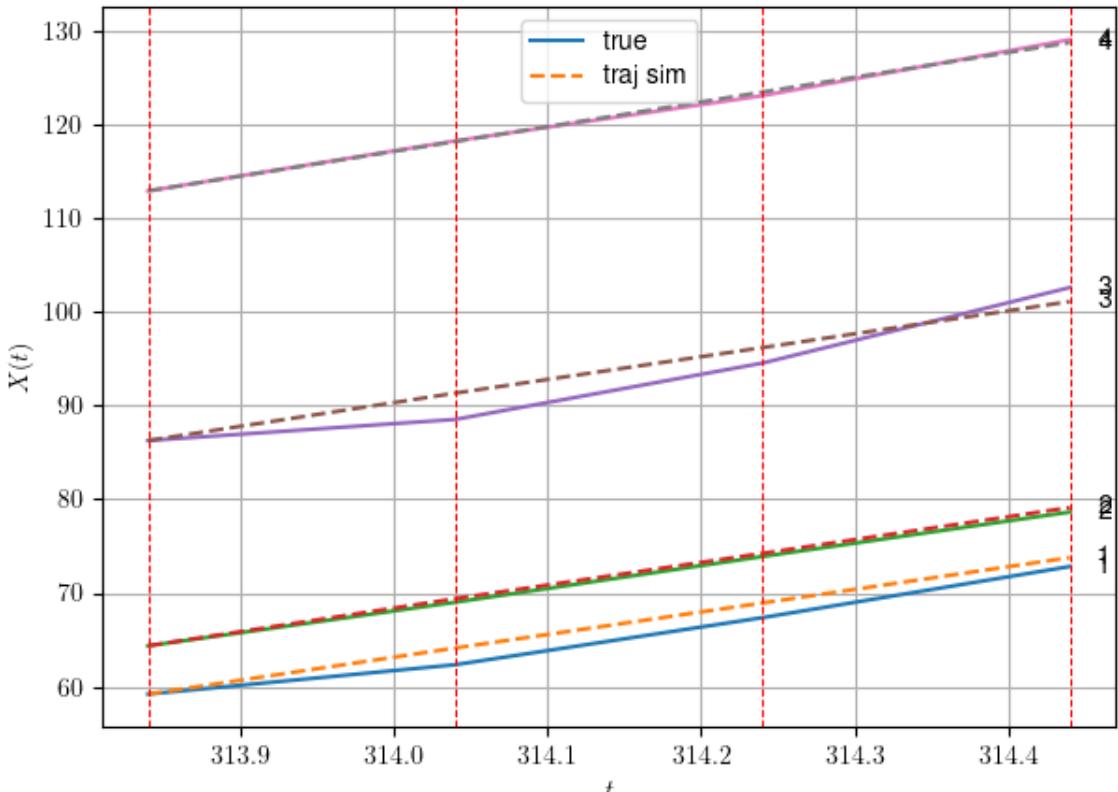
```

```

* err= 1.2609750229635595
* Learning rate NN = 5.904899080633186e-05
* diff = 3.358982706358482e-05

```

*df n. 4 – Scene n. 24, at it = 350*



For scene 24/30

```

* use LR_NN=0.0001 with err=10.864988318456957 at it=19
* v0_scn_mean = 26.825114860449865
* MAE = 1.2508199718701773

```

---



---

- Time interval n.0: [460.84, 461.04]  
\* y\_true: [19.8211655 14.23151831 20.23251805]  
\* v\_ann: [19.160152435302734, 19.089731216430664, 1  
9.11089324951172, 26.4048256752631]

---



---



---

- Time interval n.1: [461.04, 461.24]  
\* y\_true: [19.5413591 21.77263281 16.55223683]  
\* v\_ann: [18.193939208984375, 18.3037166595459, 18.  
268281936645508, 26.4048256752631]

---



---

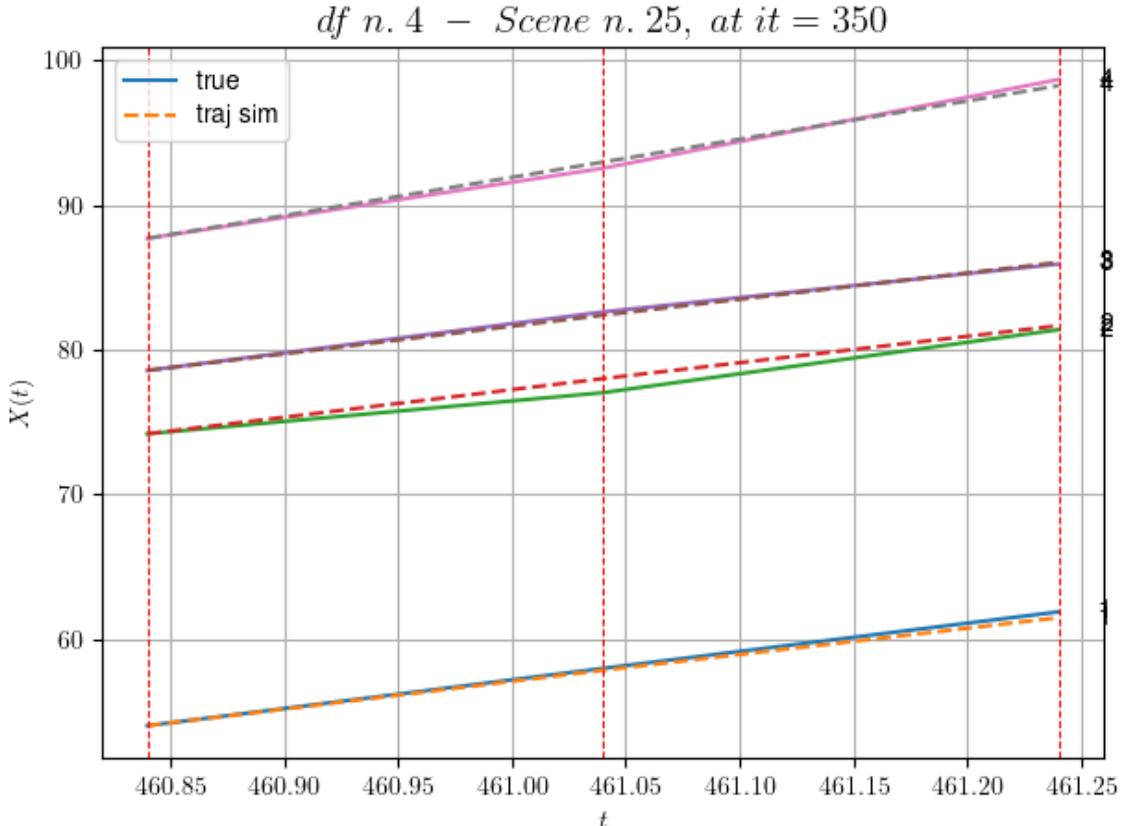


---

```

* err= 0.13620610801227329
* Learning rate NN = 0.0007289999630302191
* diff = 7.833915888488807e-07

```



For scene 25/30

- \* use LR\_NN=0.001 with err=3.3427762954273166 at it=19
  - \* v0\_scn\_mean = 26.81518136454267
  - \* MAE = 0.13620610801227329
- 
- 

For scene 26/30

- \* use LR\_NN=0.001 with err=10.101155940415032 at it=19
  - \* v0\_scn\_mean = 31.19336871918831
  - \* MAE = 0.2833646852654319
- 
- 

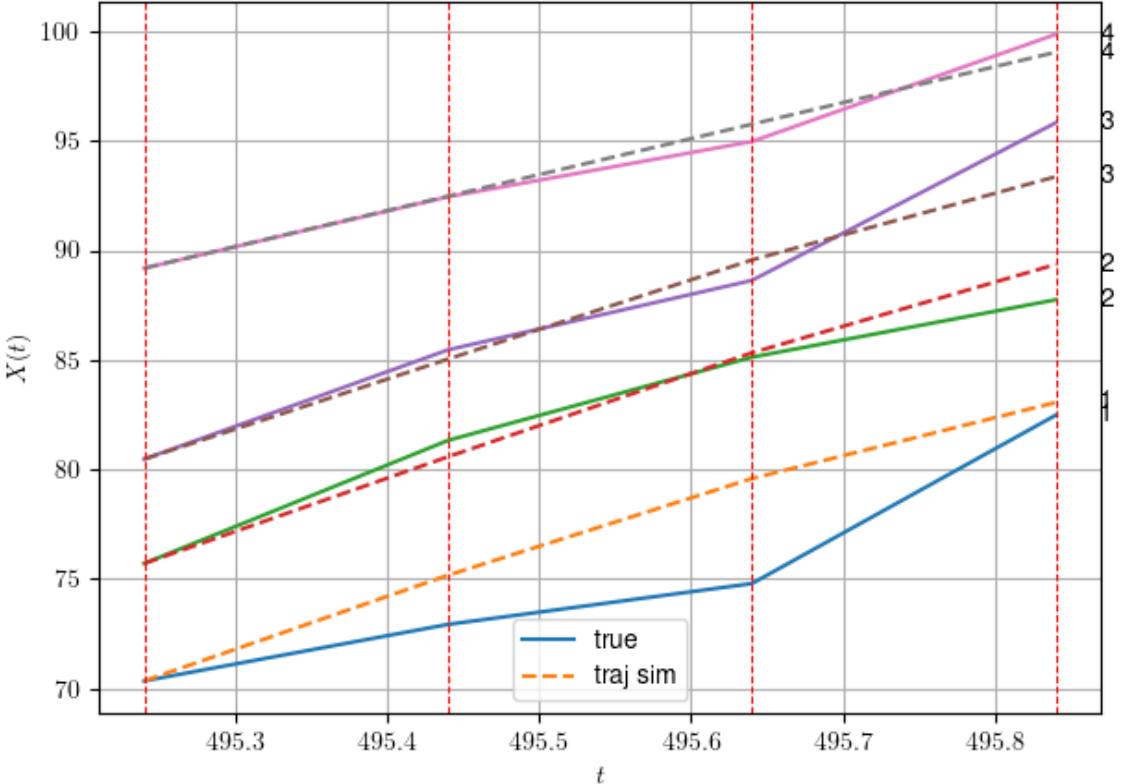
- Time interval n.0: [495.24, 495.44]
  - \* y\_true: [12.91123632 28.10335872 24.95329593]
  - \* v\_ann: [24.134740829467773, 24.364604949951172, 2.847890853881836, 16.439733421153882]
- Time interval n.1: [495.44, 495.64]
  - \* y\_true: [ 9.32105302 18.99250639 15.85230368]
  - \* v\_ann: [22.076993942260742, 23.740501403808594, 2.62839698791504, 16.439733421153882]
- Time interval n.2: [495.64, 495.84]

```
* y_true: [38.46439916 13.12188353 36.00587838]
* v_ann: [17.386281967163086, 20.186853408813477, 1
9.024375915527344, 16.439733421153882]
```

---

```
* err= 2.4992456363816586
* Learning rate NN = 0.0005904899444431067
* diff = 0.0007805066420506272
```

*df n. 4 – Scene n. 27, at it = 350*



For scene 27/30

```
* use LR_NN=0.001 with err=10.544952083387187 at it=19
* v0_scn_mean = 17.987511647231127
* MAE = 2.4992456363816586
```

---



---

```
- Time interval n.0: [541.84, 542.04]
* y_true: [15.49040827 18.57067001 15.06113134]
* v_ann: [19.00322723388672, 19.10588836669922, 19.
103843688964844, 25.31225808344113]
```

---



---

```
- Time interval n.1: [542.04, 542.24]
* y_true: [18.02057424 22.22093452 14.29121645]
* v_ann: [18.470184326171875, 18.345829010009766, 1
8.32575035095215, 25.31225808344113]
```

---



---

```
- Time interval n.2: [542.24, 542.44]
* y_true: [23.32090187 15.10072652 30.16295254]
```

\* v\_ann: [18.423662185668945, 18.30733299255371, 1  
8.25021743774414, 25.31225808344113]

---

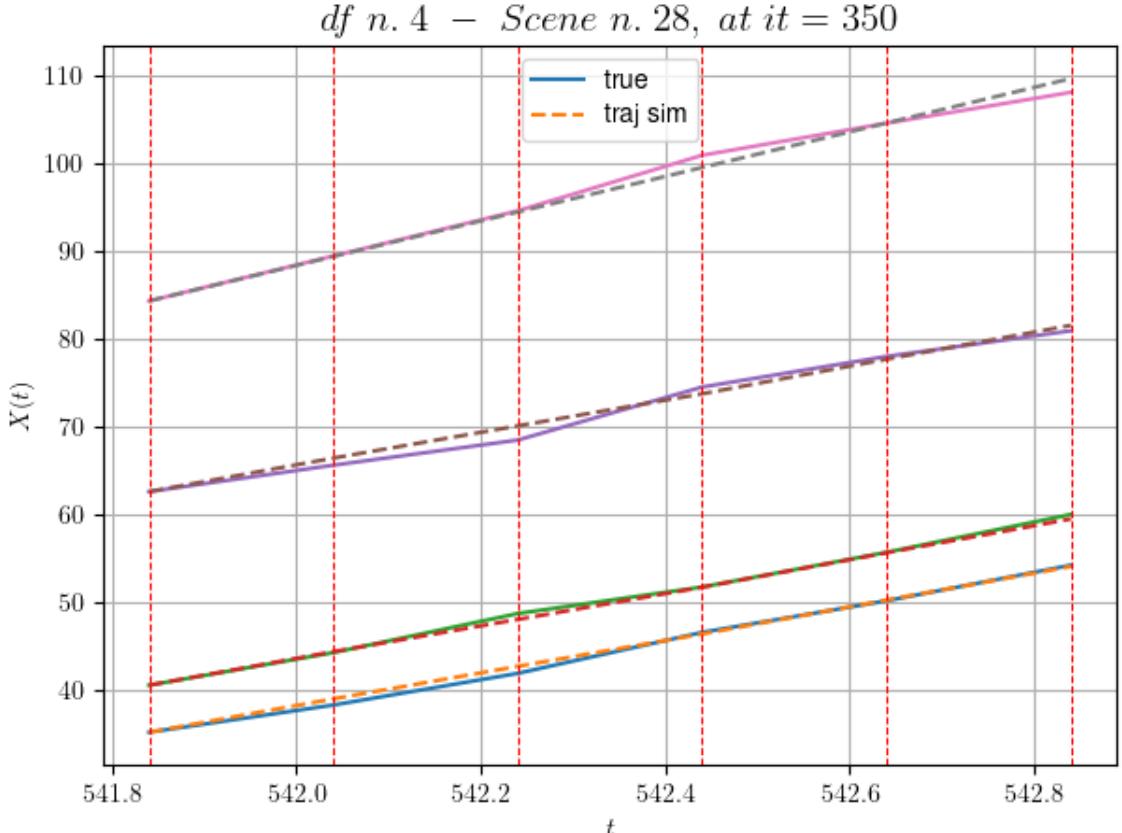
- Time interval n.3: [542.44, 542.64]  
\* y\_true: [17.96079787 19.72113387 17.42186984]  
\* v\_ann: [19.31837272644043, 19.606081008911133, 1  
9.665239334106445, 25.31225808344113]

---

- Time interval n.4: [542.64, 542.84]  
\* y\_true: [20.261096 21.55138585 14.58174174]  
\* v\_ann: [19.085521697998047, 19.232799530029297, 1  
9.270044326782227, 25.31225808344113]

---

\* err= 0.4444489105133214  
\* Learning rate NN = 0.0001937102060765028  
\* diff = 3.0164017199962867e-05



For scene 28/30

\* use LR\_NN=0.0005 with err=18.534733262500158 at it=19  
\* v0\_scn\_mean = 25.84732019492212  
\* MAE = 0.4444489105133214

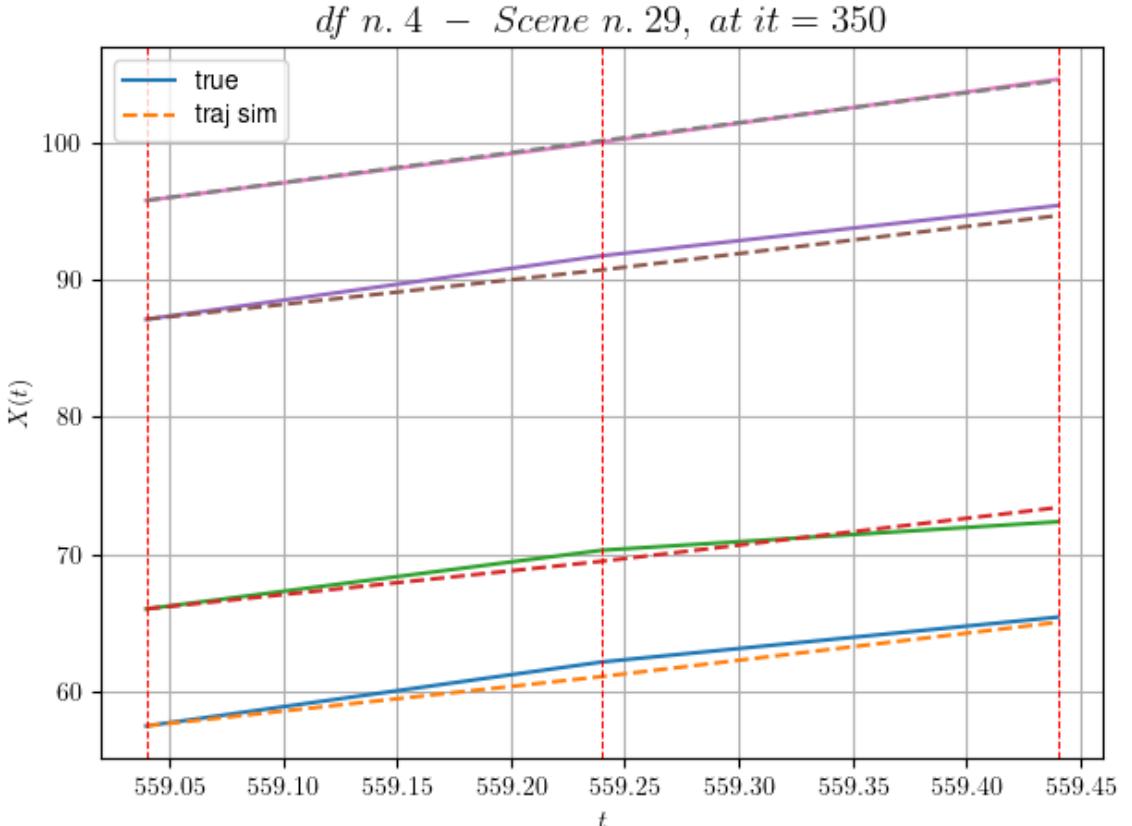
---

- Time interval n.0: [559.04, 559.24]  
\* y\_true: [23.32160164 21.40183754 23.15354324]

\* v\_ann: [18.010669708251953, 17.377771377563477, 1  
8.004125595092773, 21.821996764913905]

```
- Time interval n.1: [559.24, 559.44]
  * y_true: [16.34126249 10.38103794 18.30306556]
  * v_ann: [19.770286560058594, 19.57807731628418, 1
48828, 21.821996764913905]
```

```
* err= 0.38441314986902453  
* Learning rate NN = 0.00036449998151510954  
* diff = 9.029993690923277e-05
```



For scene 29/30

\* use LR\_NN=0.0005 with err=5.844863571208522 at it=19  
\* v0\_scn\_mean = 22.755439722429752  
\* MAE = 0.379299240411523

For df=4 with 30 scenes, time taken: 396.34

In df n.5/10 we have 14 scenes

- Time interval n.0: [23.72, 23.92]

```

* y_true: [21.79018354 24.07032953]
* v_ann: [20.79743003845215, 19.009031295776367, 2
4.534843225110123]

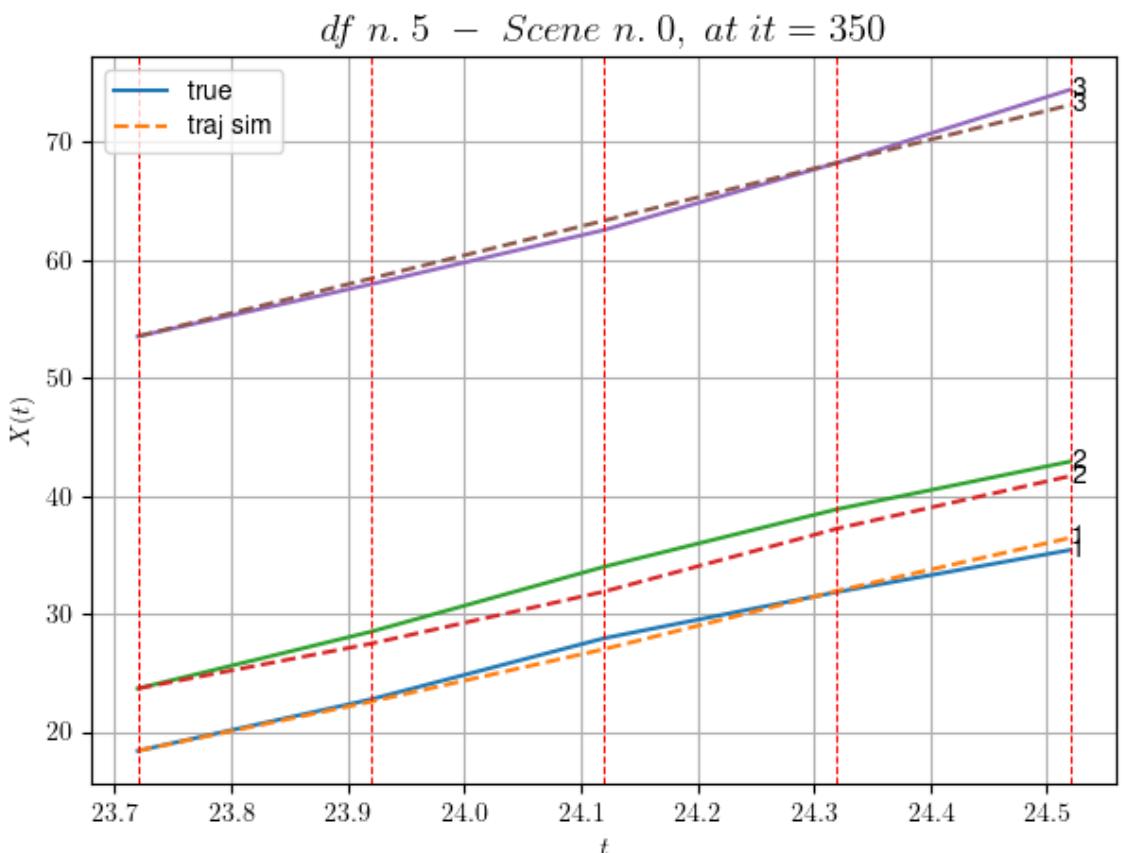
-----
- Time interval n.1: [23.92, 24.12]
* y_true: [25.91031727 27.52052784]
* v_ann: [22.28333854675293, 22.0712833404541, 24.5
34843225110123]

-----
- Time interval n.2: [24.12, 24.32]
* y_true: [19.61033273 24.42062846]
* v_ann: [24.720378875732422, 26.703144073486328, 2
4.534843225110123]

-----
- Time interval n.3: [24.32, 24.52]
* y_true: [17.8304062 20.21066815]
* v_ann: [22.48931312561035, 22.282573699951172, 2
4.534843225110123]

-----
* err= 0.9451610990497542
* Learning rate NN = 0.000478296831715852
* diff = 1.969517235522744e-06

```



For scene 0/14

```

* use LR_NN=0.001 with err=19.44340869889344 at it=19
* v0_scn_mean = 25.00324561146117

```

\* MAE = 0.5958247950974325

---



---

- Time interval n.0: [28.12, 28.32]  
 \* y\_true: [22.39001619 28.9506918 ]  
 \* v\_ann: [28.30097198486328, 27.423534393310547, 2  
 5.379417180280814]

---

- Time interval n.1: [28.32, 28.52]  
 \* y\_true: [21.14004613 26.65085251]  
 \* v\_ann: [26.450979232788086, 25.527130126953125, 2  
 5.379417180280814]

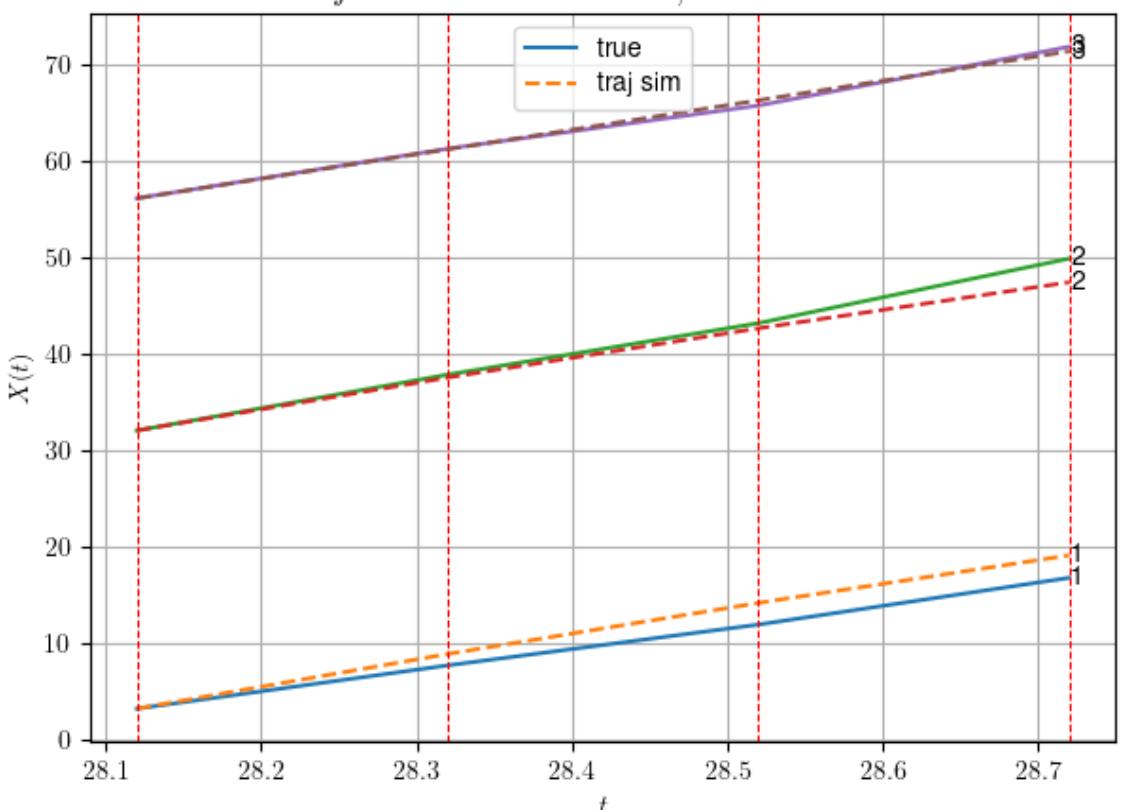
---

- Time interval n.2: [28.52, 28.72]  
 \* y\_true: [24.23010561 33.45140848]  
 \* v\_ann: [24.66596221923828, 23.836681365966797, 2  
 5.379417180280814]

---

\* err= 1.5657321265017352  
 \* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.002049995932048132

*df n. 5 – Scene n. 1, at it = 350*



For scene 1/14

\* use LR\_NN=0.0005 with err=5.0099079950010745 at it=19

```
* vθ_scn_mean = 25.77543363657596
* MAE = 1.5657321265017352
```

---



---

```
- Time interval n.0: [146.52, 146.72]
  * y_true: [32.70054419 14.69037585]
  * v_ann: [24.818599700927734, 24.83711814880371, 3
3.247161814507386]
```

---

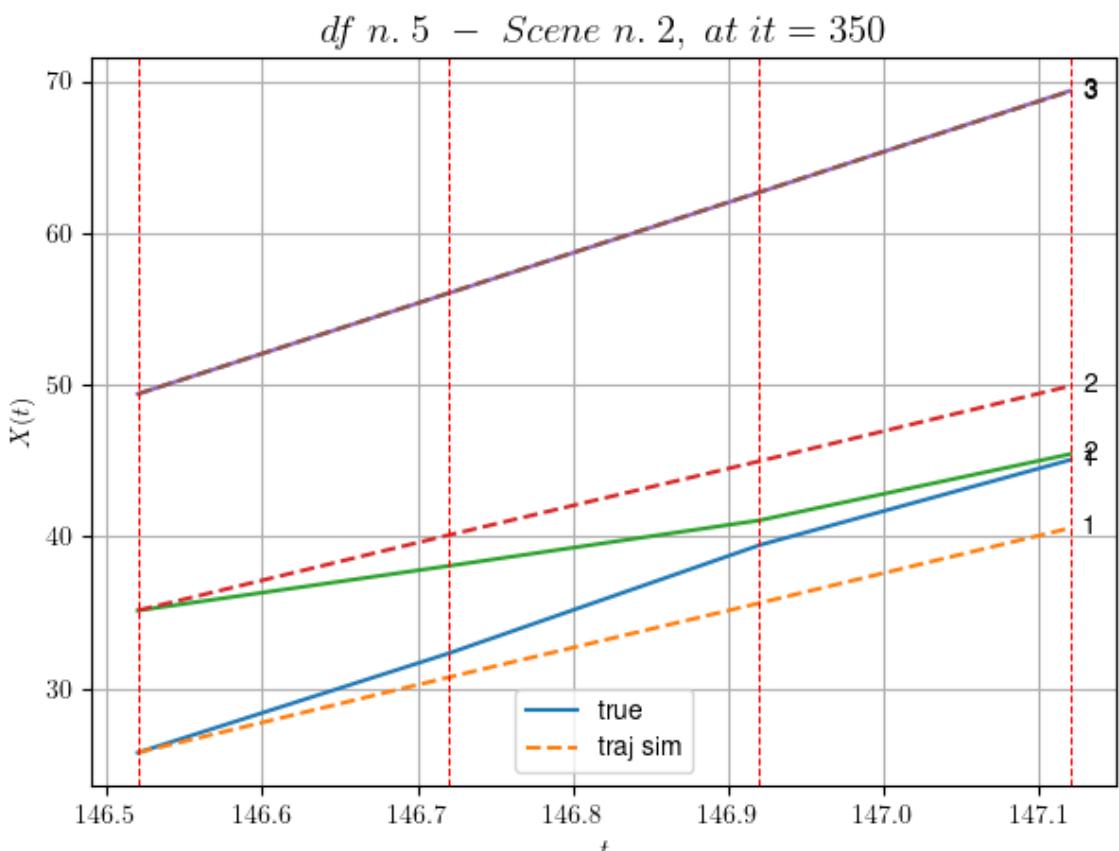
```
- Time interval n.1: [146.72, 146.92]
  * y_true: [35.65090038 15.01046474]
  * v_ann: [24.45138931274414, 24.36065101623535, 33.
247161814507386]
```

---

```
- Time interval n.2: [146.92, 147.12]
  * y_true: [28.09191726 21.83491468]
  * v_ann: [24.731910705566406, 24.768774032592773, 3
3.247161814507386]
```

---

```
* err= 6.38702373022513
* Learning rate NN = 0.0002952449722215533
* diff = 0.1000E+02E+01026200.00
```



For scene 2/14

\* use LR\_NN=0.0005 with err=29.271829930298892 at it=19

```
* v0_scn_mean = 32.968857201221304
* MAE = 6.370029217956515
```

---



---

```
- Time interval n.0: [151.12, 151.32]
  * y_true: [20.88055844 29.97204611]
  * v_ann: [27.668289184570312, 27.037912368774414, 3
1.51612778259406]
```

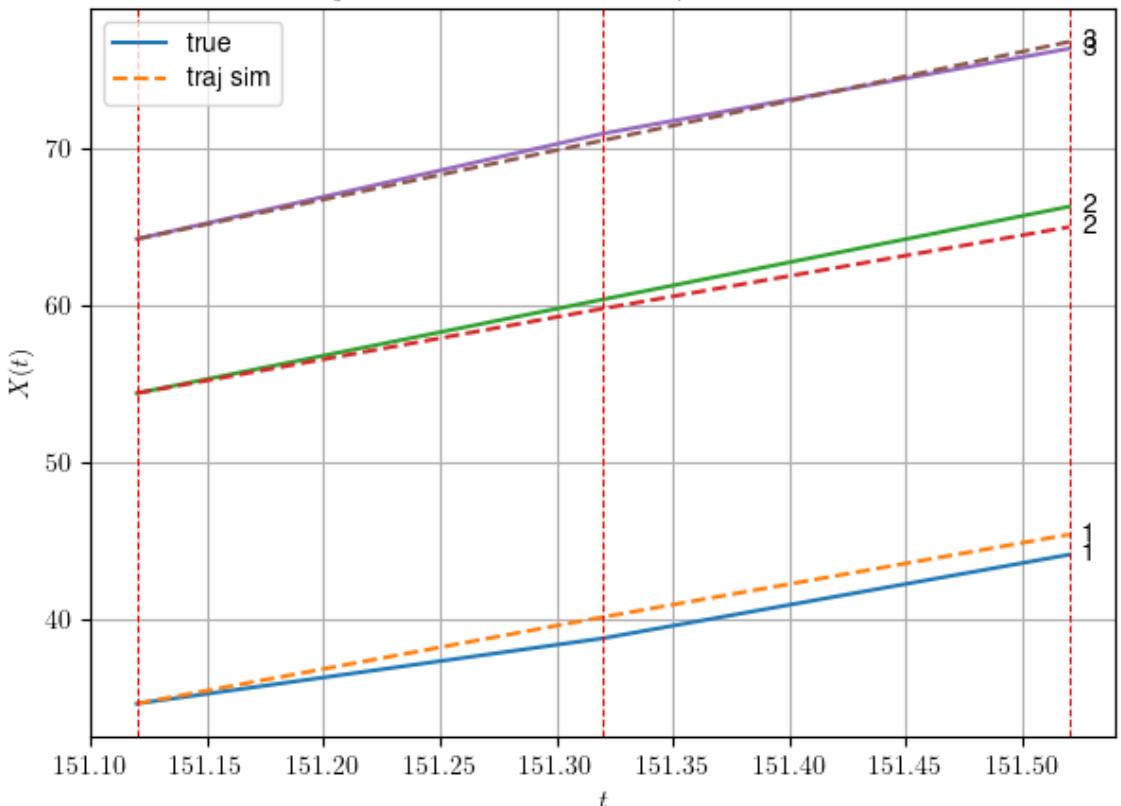
---

```
- Time interval n.1: [151.32, 151.52]
  * y_true: [26.72089495 29.6522691 ]
  * v_ann: [26.36759376525879, 26.071189880371094, 3
1.51612778259406]
```

---

```
* err= 0.6582018165787562
* Learning rate NN = 0.00036449998151510954
* diff = 6.585102106559081e-05
```

*df n. 5 – Scene n. 3, at it = 350*



For scene 3/14

```
* use LR_NN=0.0005 with err=5.758800791203869 at it=19
* v0_scn_mean = 31.38618496473311
* MAE = 0.6582018165787562
```

---



---

```
- Time interval n.0: [177.32, 177.52]
  * y_true: [23.78017477 21.57540501]
  * v_ann: [27.797222137451172, 28.29766082763672, 2
6.18040598473072]

-----
- Time interval n.1: [177.52, 177.72]
  * y_true: [28.99044664 21.37044807]
  * v_ann: [25.513736724853516, 25.598360061645508, 2
6.18040598473072]

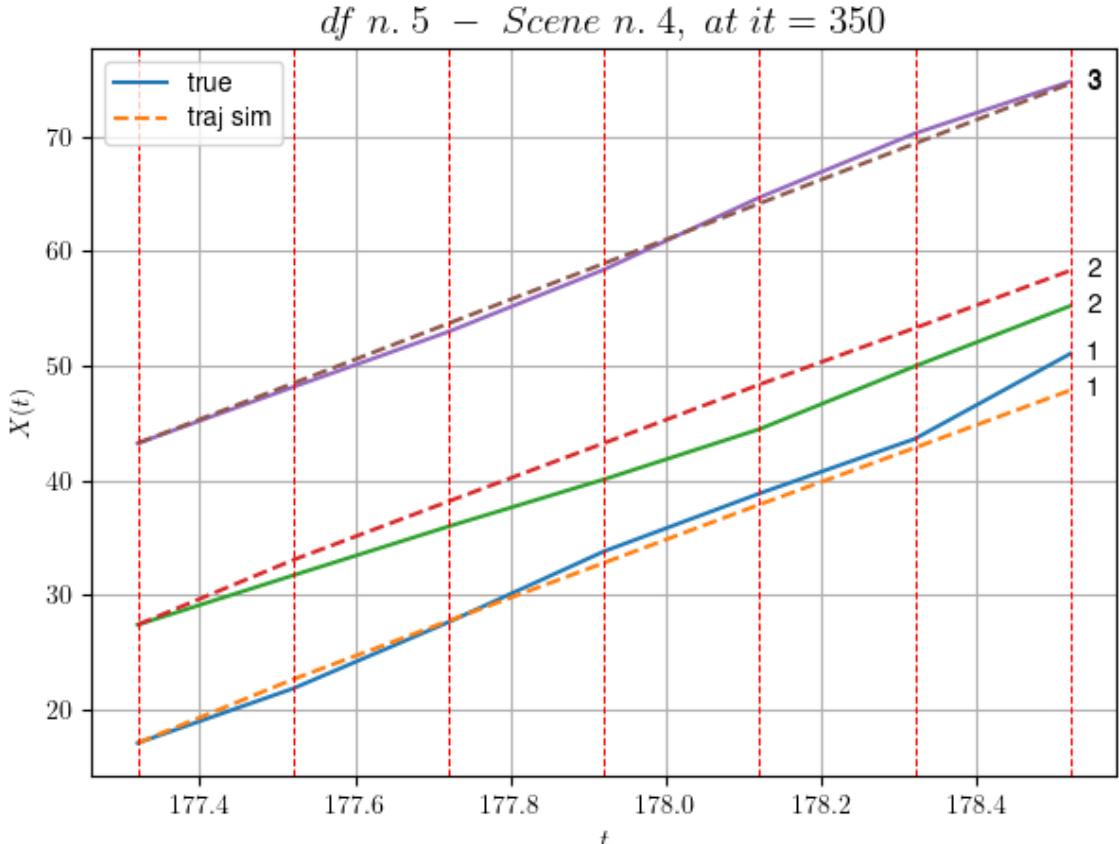
-----
- Time interval n.2: [177.72, 177.92]
  * y_true: [30.9005134 20.55062028]
  * v_ann: [25.35320472717285, 25.421842575073242, 2
6.18040598473072]

-----
- Time interval n.3: [177.92, 178.12]
  * y_true: [25.28069635 21.93575232]
  * v_ann: [25.451305389404297, 25.595144271850586, 2
6.18040598473072]

-----
- Time interval n.4: [178.12, 178.32]
  * y_true: [23.87574209 27.4762805 ]
  * v_ann: [24.80746841430664, 24.64605140686035, 26.
18040598473072]

-----
- Time interval n.5: [178.32, 178.52]
  * y_true: [37.1766426 26.34131635]
  * v_ann: [25.12347412109375, 25.136354446411133, 2
6.18040598473072]

-----
* err= 3.229738637776164
* Learning rate NN = 0.00031381050939671695
* diff = 0 0005508897238701840
```



For scene 4/14

- \* use LR\_NN=0.001 with err=35.99098469421517 at it=19
- \* v0\_scn\_mean = 26.507772065035116
- \* MAE = 2.7843252409741965

---



---

- Time interval n.0: [266.92, 267.12]
- \* y\_true: [18.75024149 31.34179995]
- \* v\_ann: [31.070419311523438, 29.847698211669922, 29.085708232493797]

---



---

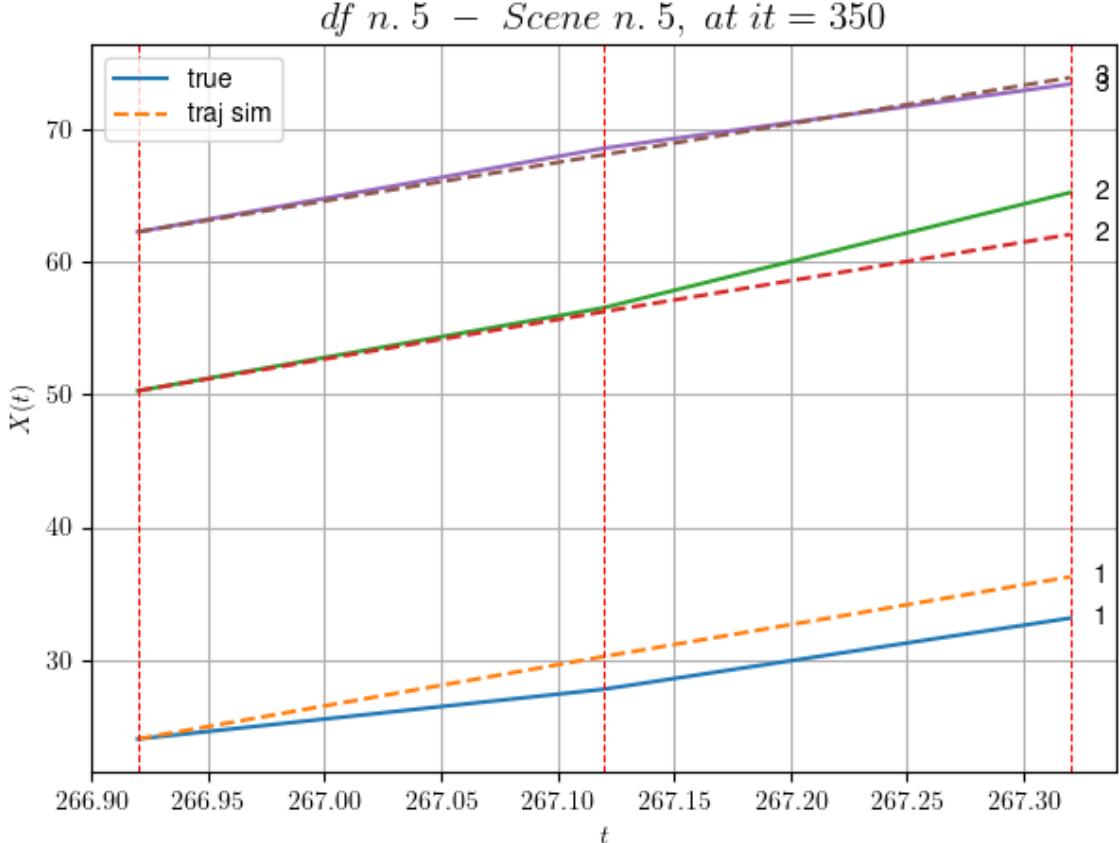
- Time interval n.1: [267.12, 267.32]
- \* y\_true: [26.80047756 43.40316595]
- \* v\_ann: [30.019115447998047, 29.11721420288086, 29.085708232493797]

---



---

- \* err= 2.918457772994589
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.0008220041202600115



For scene 5/14

- \* use LR\_NN=0.0001 with err=13.2753055514929 at it=19
- \* v0\_scn\_mean = 29.164069469574116
- \* MAE = 2.918457772994589

---



---

- Time interval n.0: [316.92, 317.12]
- \* y\_true: [22.23560763 28.12633872]
- \* v\_ann: [25.239084243774414, 25.167970657348633, 2 2.34210119630189]

---



---

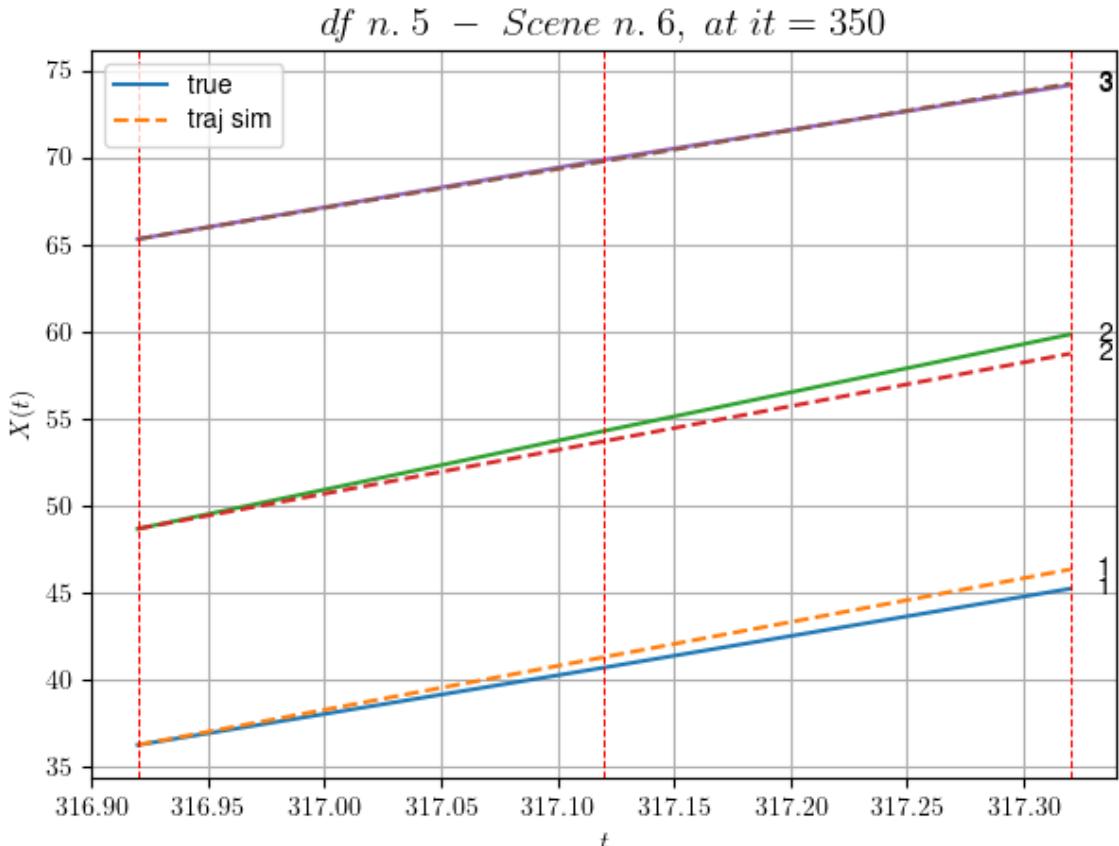
- Time interval n.1: [317.12, 317.32]
- \* y\_true: [22.67586827 27.74684297]
- \* v\_ann: [25.2086238861084, 25.174612045288086, 22. 34210119630189]

---



---

- \* err= 0.35312023938466003
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00022853664681155017



For scene 6/14

- \* use LR\_NN=0.0005 with err=1.3466389528120593 at it=19
- \* v0\_scn\_mean = 22.99843700181229
- \* MAE = 0.35312023938466003

---



---

For scene 7/14

- \* use LR\_NN=0.001 with err=8.195077046139165 at it=19
- \* v0\_scn\_mean = 27.555695130783338
- \* MAE = 0.03163436540061177

---



---

For scene 8/14

- \* use LR\_NN=5e-05 with err=1.8713883320684739 at it=19
- \* v0\_scn\_mean = 34.514893662539684
- \* MAE = 0.006000754345427839

---



---

- Time interval n.0: [338.52, 338.72]
    - \* y\_true: [22.83038671 20.44060351]
    - \* v\_ann: [23.94913101196289, 23.97880744934082, 27.853943933248797]
-

```

-----  

- Time interval n.1: [338.72, 338.92]  

  * y_true: [25.85061095 23.65082523]  

  * v_ann: [23.47209358215332, 23.55126953125, 27.853  

943933248797]  

-----  

- Time interval n.2: [338.92, 339.12]  

  * y_true: [28.6708889 22.23087004]  

  * v_ann: [23.70181655883789, 23.834196090698242, 2  

7.853943933248797]  

-----  

- Time interval n.3: [339.12, 339.32]  

  * y_true: [26.0610325 19.88098798]  

  * v_ann: [23.979084014892578, 24.233779907226562, 2  

7.853943933248797]  

-----  

- Time interval n.4: [339.32, 339.52]  

  * y_true: [27.9415295 20.92126982]  

  * v_ann: [23.71553611755371, 24.048189163208008, 2  

7.853943933248797]  

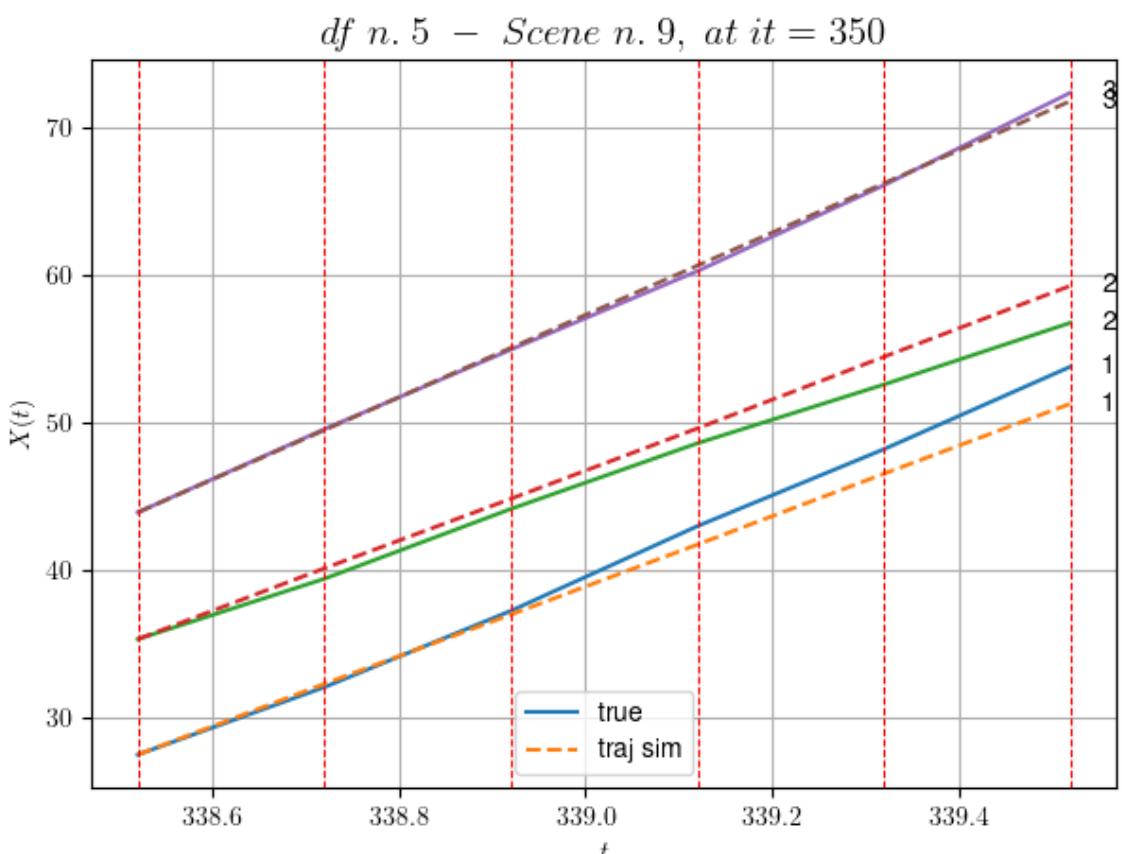
-----  

* err= 1.2782039837523318  

* Learning rate NN = 0.0001937102060765028  

* diff = 0.0003750753462066214

```



For scene 9/14

\* use LR\_NN=0.0005 with err=12.821213719258454 at it=19

\* v0\_scn\_mean = 28.037876036995176

\* MAE = 1.231470565492519

```
=====
=====

- Time interval n.0: [435.72, 435.92]
  * y_true: [16.6003121 32.10080247]
  * v_ann: [20.646635055541992, 18.959850311279297, 2
3.002320042478413]

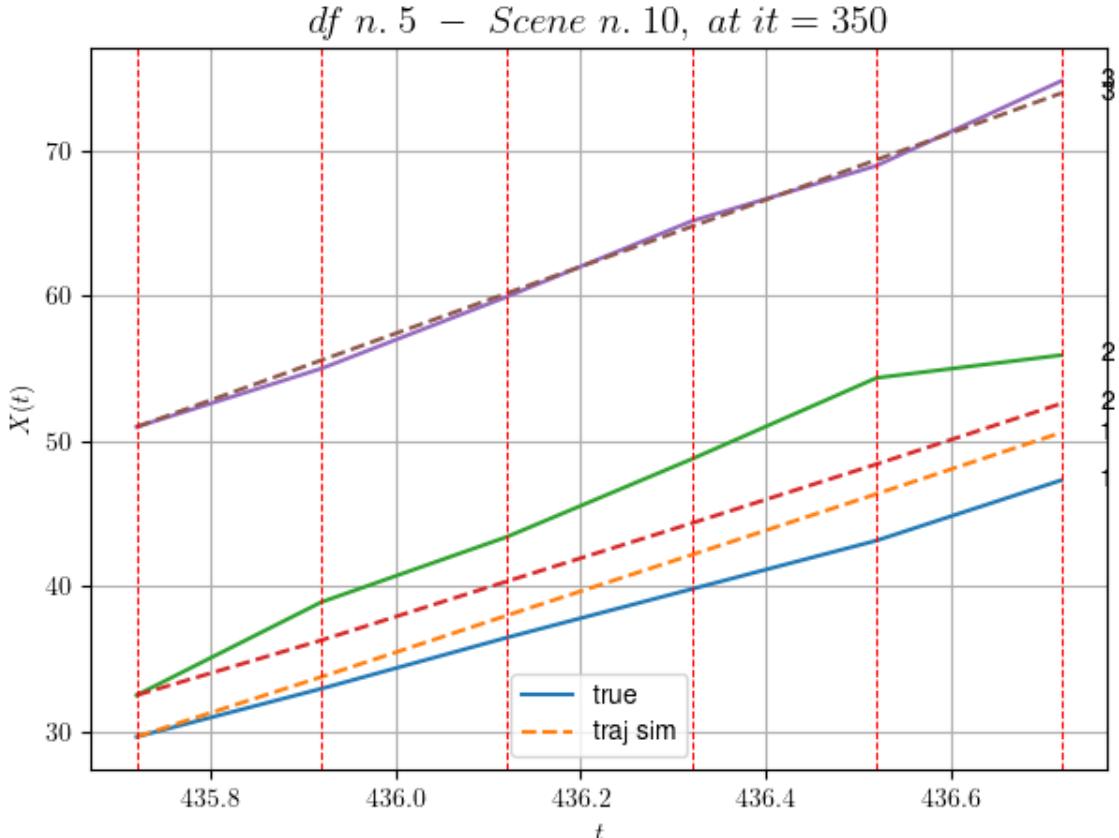
-----
- Time interval n.1: [435.92, 436.12]
  * y_true: [17.55040576 22.4007406 ]
  * v_ann: [21.115816116333008, 20.223487854003906, 2
3.002320042478413]

-----
- Time interval n.2: [436.12, 436.32]
  * y_true: [16.72550921 26.8011085 ]
  * v_ann: [20.90894317626953, 20.04387855529785, 23.
002320042478413]

-----
- Time interval n.3: [436.32, 436.52]
  * y_true: [16.72550921 28.00144696]
  * v_ann: [20.98293113708496, 20.36227035522461, 23.
002320042478413]

-----
- Time interval n.4: [436.52, 436.72]
  * y_true: [20.80081615 7.85046318]
  * v_ann: [21.155092239379883, 20.901851654052734, 2
3.002320042478413]

-----
* err= 6.290088913609254
* Learning rate NN = 0.0001937102060765028
* diff = 0.0032364545692740165
```



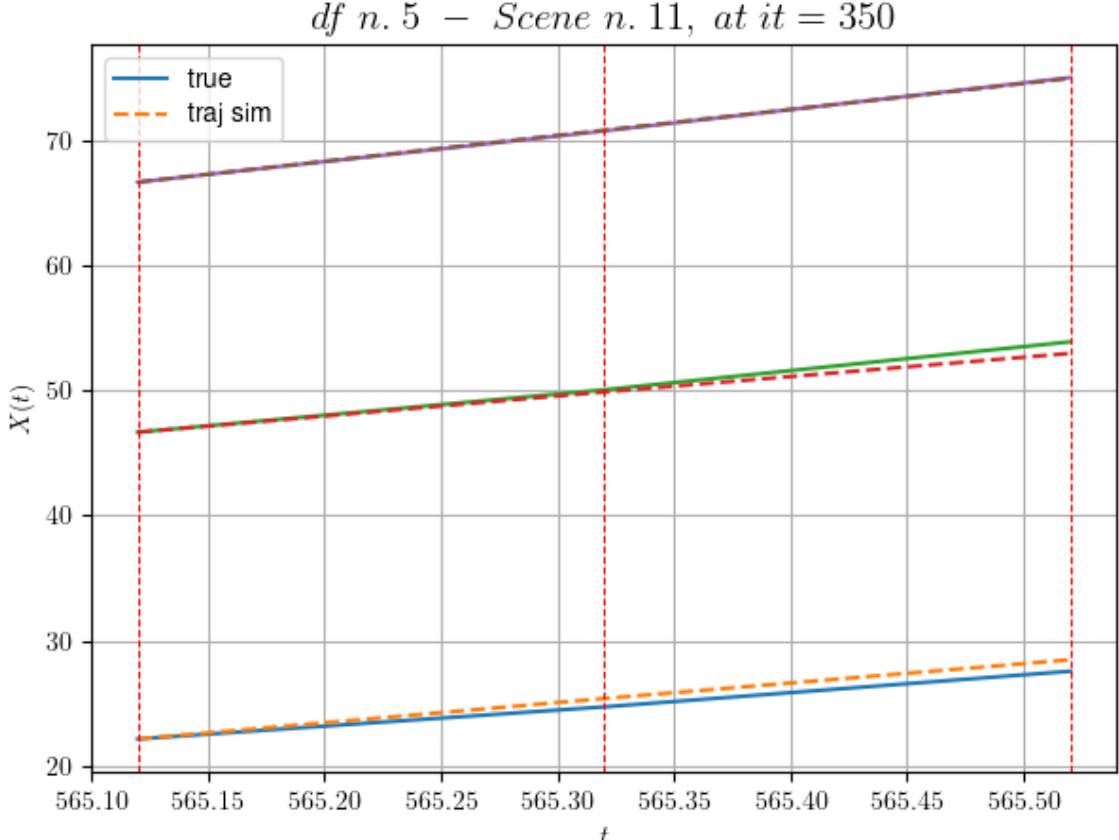
For scene 10/14

\* use LR\_NN=0.0005 with err=15.39648491552488 at it=19  
 \* v0\_scn\_mean = 23.602070447825245  
 \* MAE = 6.284528046213668

- Time interval n.0: [565.12, 565.32]  
 \* y\_true: [12.82514463 16.9507403 ]  
 \* v\_ann: [16.172605514526367, 16.073081970214844, 2  
 0.750380470950947]

- Time interval n.1: [565.32, 565.52]  
 \* y\_true: [14.2510345 19.19106683]  
 \* v\_ann: [15.498453140258789, 15.452722549438477, 2  
 0.750380470950947]

\* err= 0.24263376388277205  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.0005482745483962326



For scene 11/14

- \* use LR\_NN=0.0005 with err=2.5506108888891597 at it=19
  - \* v0\_scn\_mean = 21.543137941359785
  - \* MAE = 0.2142292408860634
- 
- 

For scene 12/14

- \* use LR\_NN=5e-05 with err=3.627296596030018 at it=19
  - \* v0\_scn\_mean = 21.768162114369044
  - \* MAE = 0.09421355768435585
- 
- 

For scene 13/14

- \* use LR\_NN=0.001 with err=6.80251303774229 at it=19
  - \* v0\_scn\_mean = 26.653774489439495
  - \* MAE = 0.7819533244166292
- 
- 

For df=5 with 14 scenes, time taken: 133.79

---



---

\*\*\*\*\*  
\*\*\*\*\*

In df n.6/10 we have 3 scenes

---



---

- Time interval n.0: [552.20, 552.40]
  - \* y\_true: [14.01030513 13.18063102]
  - \* v\_ann: [17.832008361816406, 18.3364315032959, 20.233275612773287]

---



---

- Time interval n.1: [552.40, 552.60]
  - \* y\_true: [18.39048446 22.9012939 ]
  - \* v\_ann: [17.703580856323242, 18.0524845123291, 20.233275612773287]

---



---

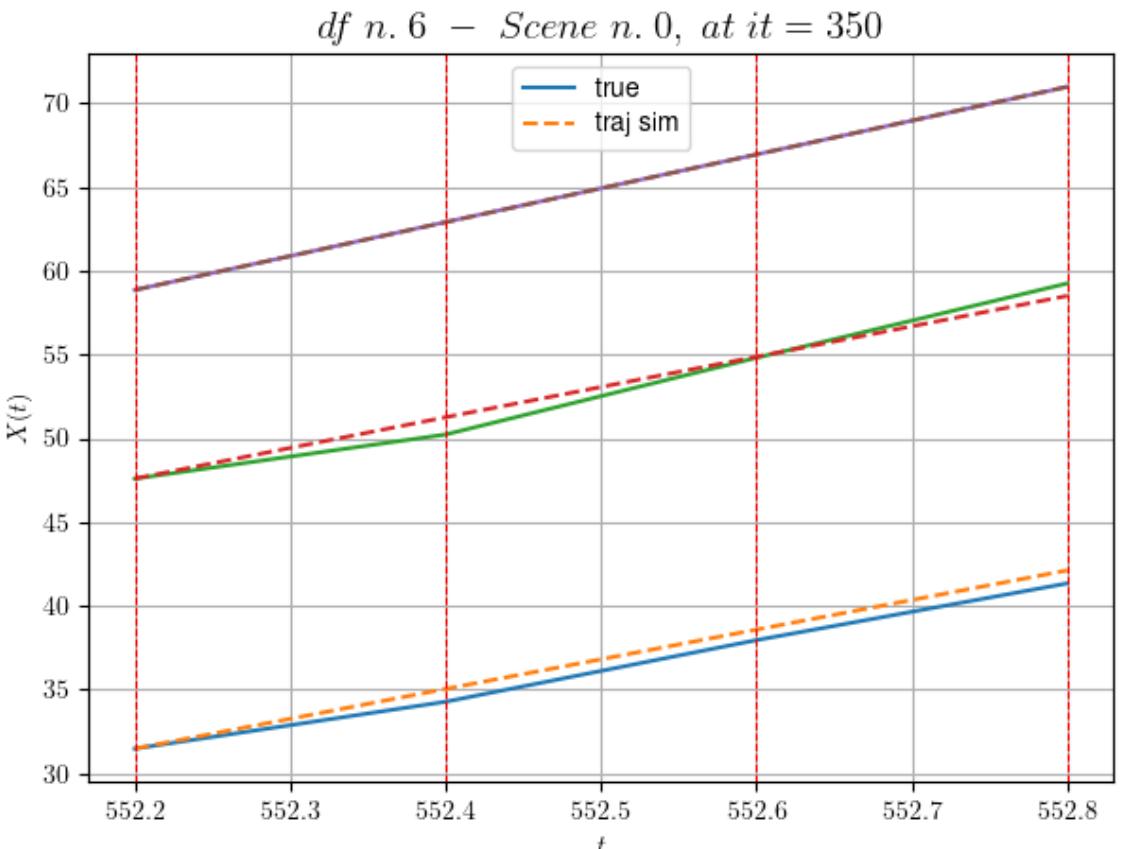
- Time interval n.2: [552.60, 552.80]
  - \* y\_true: [16.95052919 22.22132939]
  - \* v\_ann: [17.700284957885742, 18.19440269470215, 20.233275612773287]

---



---

- \* err= 0.2668033299762211
- \* Learning rate NN = 2.952449540316593e-05
- \* diff = 0.0005649103212664874



For scene 0/3

- \* use LR\_NN=5e-05 with err=5.8075361777528896 at it=19
- \* v0\_scn\_mean = 21.070352607678007
- \* MAE = 0.25036854888859067

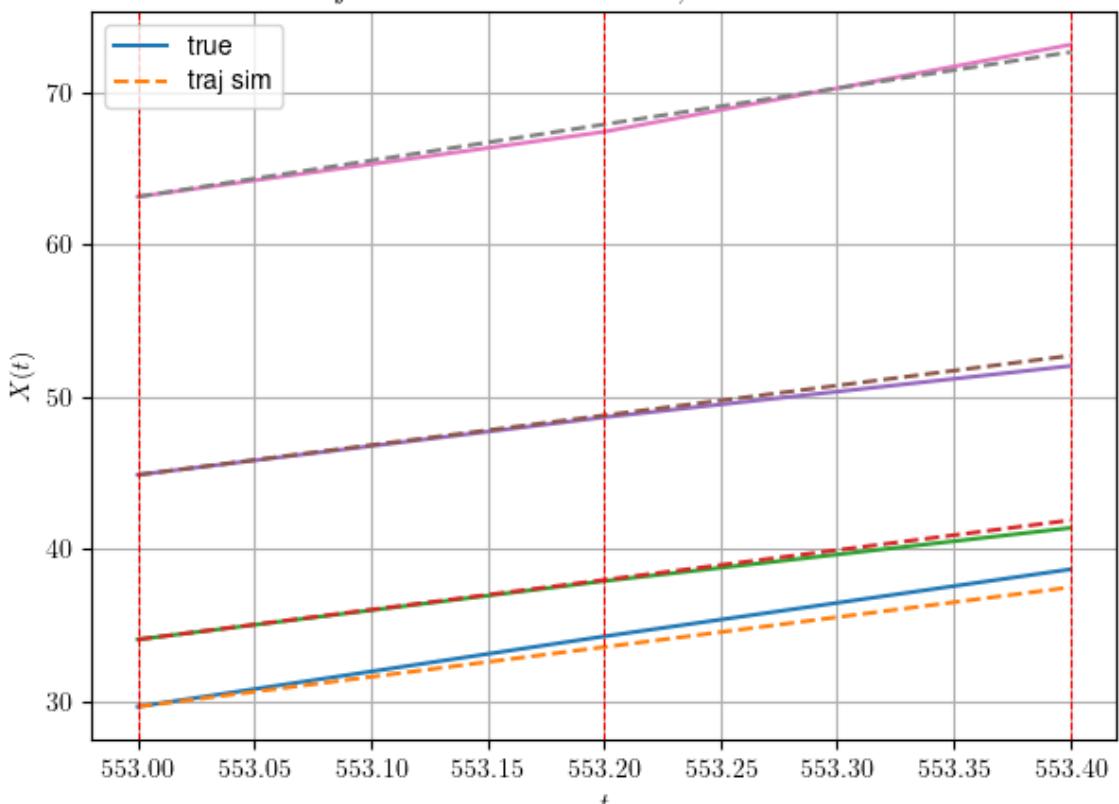
---

- Time interval n.0: [553.00, 553.20]  
 \* y\_true: [23.0804555 19.17546127 18.9008181 ]  
 \* v\_ann: [19.569377899169922, 19.55061149597168, 1  
 9.52875328063965, 23.749701248855363]

- Time interval n.1: [553.20, 553.40]  
 \* y\_true: [22.02058024 17.45053567 16.85079909]  
 \* v\_ann: [19.626556396484375, 19.614744186401367, 1  
 9.601497650146484, 23.749701248855363]

\* err= 0.25791026995583316  
 \* Learning rate NN = 7.289998757187277e-05  
 \* diff = 0.00025565514845166115

*df n. 6 – Scene n. 1, at it = 350*



For scene 1/3

\* use LR\_NN=0.0001 with err=6.12257987283601 at it=19  
 \* v0\_scn\_mean = 24.463114680461086  
 \* MAE = 0.2254607540567593

- Time interval n.0: [554.00, 554.20]  
 \* y\_true: [20.50061186 21.35116733 22.20133365]  
 \* v\_ann: [21.943166732788086, 21.900951385498047, 2  
 1.92542266845703, 23.647953726265413]

```

-----  

- Time interval n.1: [554.20, 554.40]  

  * y_true: [18.86075328 25.85180384 21.5614577 ]  

  * v_ann: [21.49713706970215, 21.5396671295166, 21.5  

1578140258789, 23.647953726265413]
-----
```

```

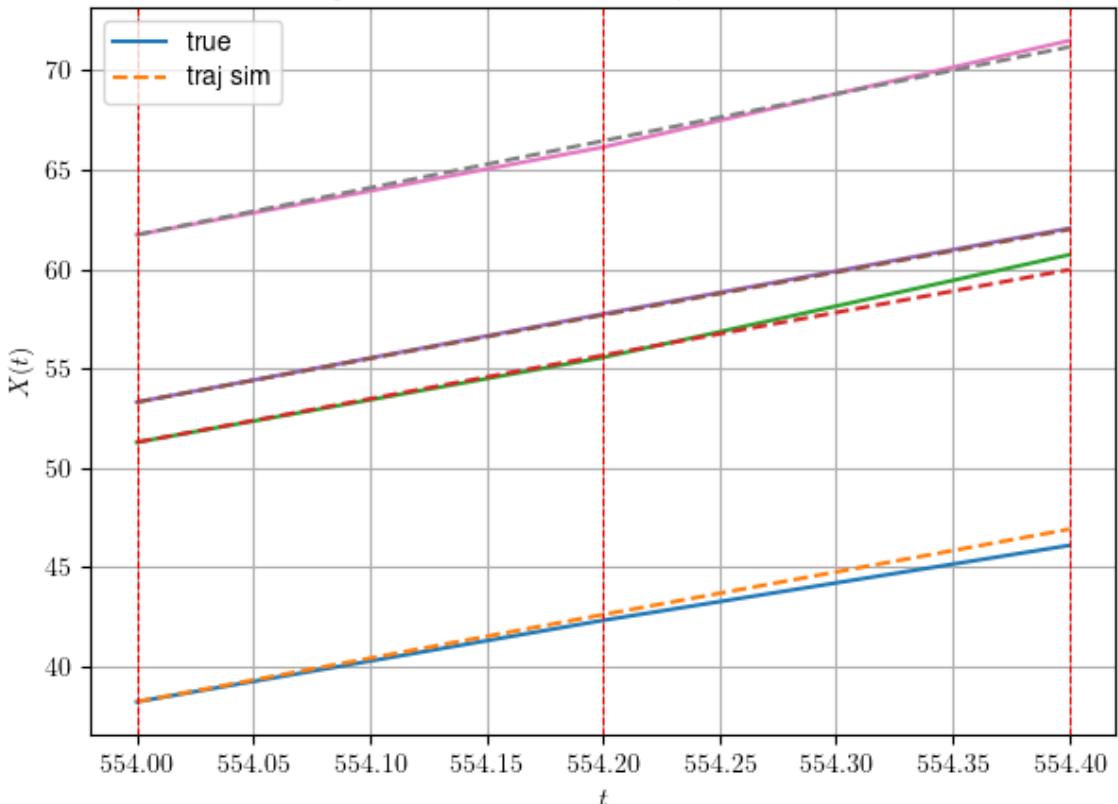
-----  

  * err= 0.1280352242709663  

  * Learning rate NN = 0.0007289999630302191  

  * diff = 3.300779032489043e-06
-----
```

*df n. 6 – Scene n. 2, at it = 350*



For scene 2/3

```

* use LR_NN=0.001 with err=7.4688144361795015 at it=19  

* v0_scn_mean = 24.372980690622708  

* MAE = 0.12696969649033457
=====
```

For df=6 with 3 scenes, time taken: 24.54

```

=====
```

In df n.7/10 we have 8 scenes

```

*****  

*****
```

```

- Time interval n.0: [38.56, 38.76]  

  * y_true: [34.50899027 34.29923068]
```

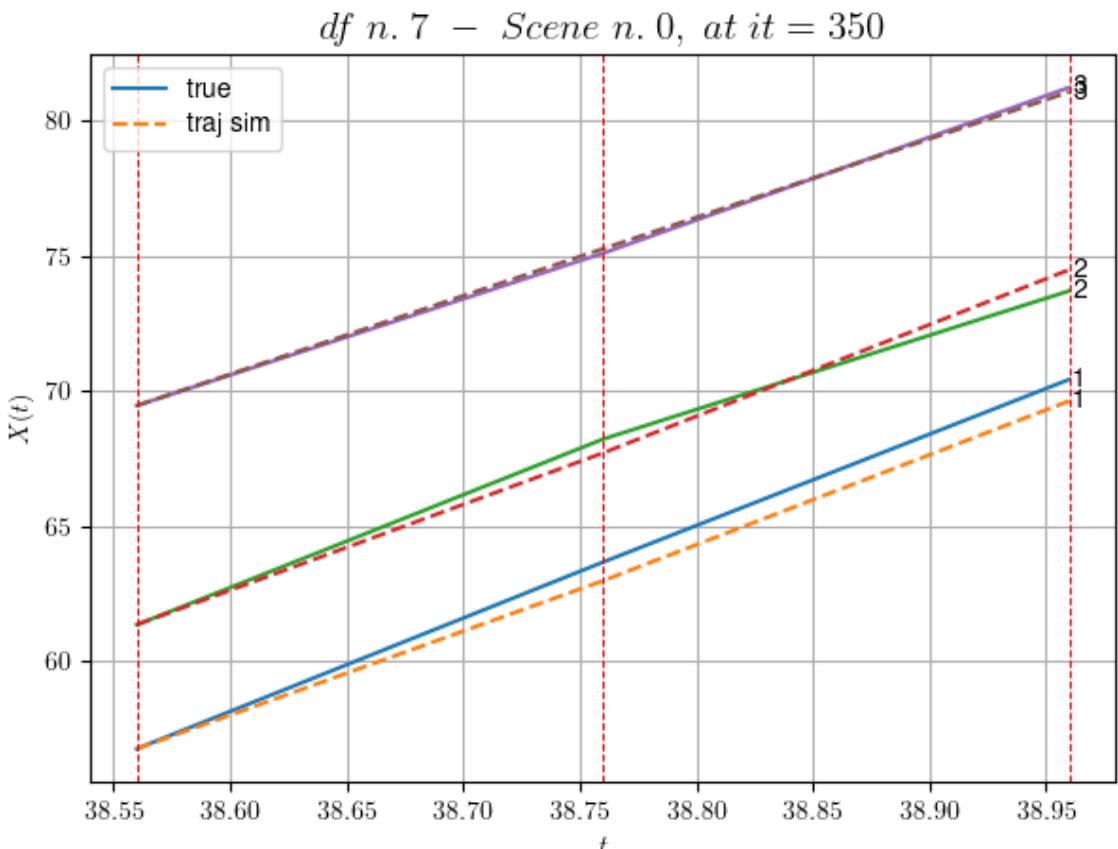
```

* v_ann: [31.060169219970703, 31.74642562866211, 2
8.990017888098876]

-----
- Time interval n.1: [38.76, 38.96]
* y_true: [33.76780394 27.40980382]
* v_ann: [33.245506286621094, 33.87731170654297, 2
8.990017888098876]

-----
* err= 0.22611314965705953
* Learning rate NN = 0.0007289999630302191
* diff = 0.0002529751462208296

```



For scene 0/8

```

* use LR_NN=0.001 with err=3.7042486106685337 at it=19
* v0_scn_mean = 29.0765804609348
* MAE = 0.22207648459368778
=====
```

For scene 1/8

```

* use LR_NN=5e-05 with err=28.327188227866042 at it=19
* v0_scn_mean = 28.857616168683286
* MAE = 0.3417964952336235
=====
```

```

- Time interval n.0: [45.96, 46.16]
  * y_true: [25.63954073 32.24792255]
  * v_ann: [28.33566665649414, 28.299232482910156, 2
  1.679426419577293]
```

---

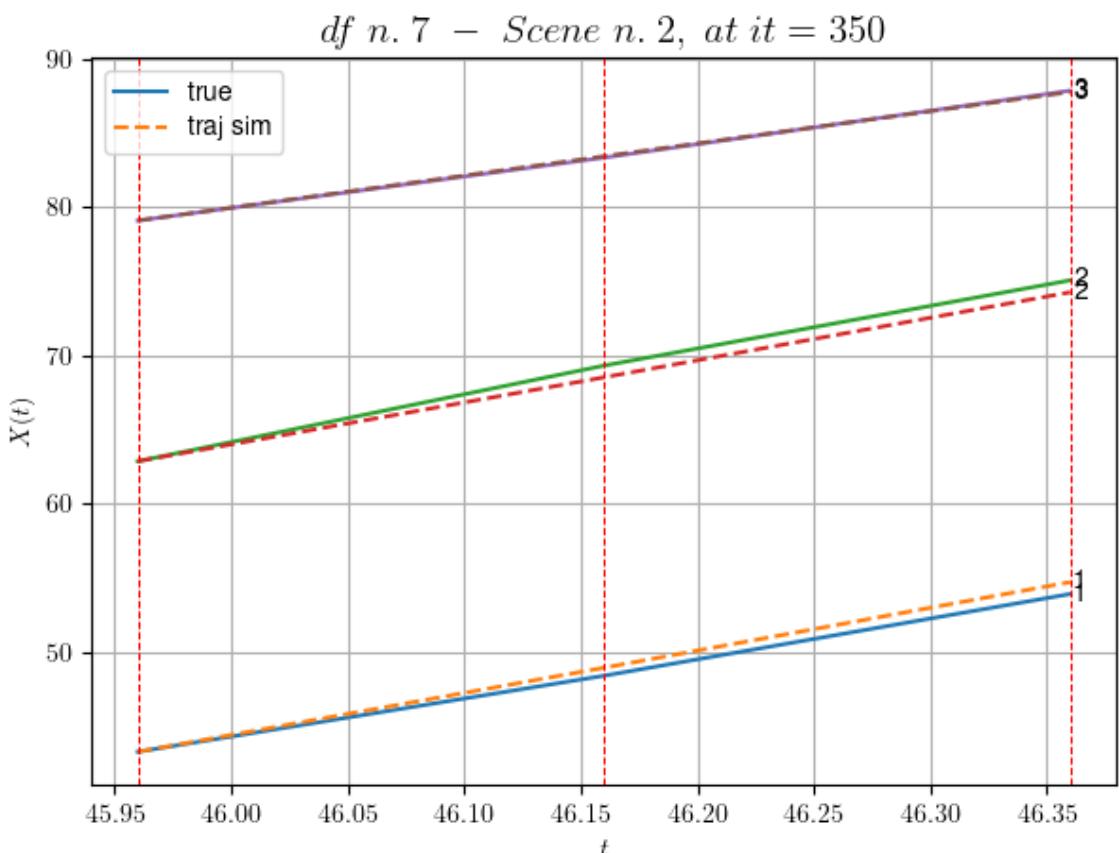
```

- Time interval n.1: [46.16, 46.36]
  * y_true: [27.5623729 28.76269973]
  * v_ann: [28.874204635620117, 28.68825912475586, 2
  1.679426419577293]
```

---

```

* err= 0.24681777649947043
* Learning rate NN = 0.00036449998151510954
* diff = 0.1424216446152682 0E
```



For scene 2/8

```

* use LR_NN=0.0005 with err=3.1100536998102015 at it=19
* v0_scn_mean = 22.39255811577796
* MAE = 0.24681777649947043
```

---



---

```

- Time interval n.0: [162.76, 162.96]
  * y_true: [10.08699654 20.77195672]
  * v_ann: [17.476655960083008, 17.614782333374023, 3
  3.51452922086696]
```

---

```

-----  

- Time interval n.1: [162.96, 163.16]  

* y_true: [12.77745535 25.37230132]  

* v_ann: [17.05147933959961, 17.100723266601562, 3  

3.51452922086696]
-----
```

```

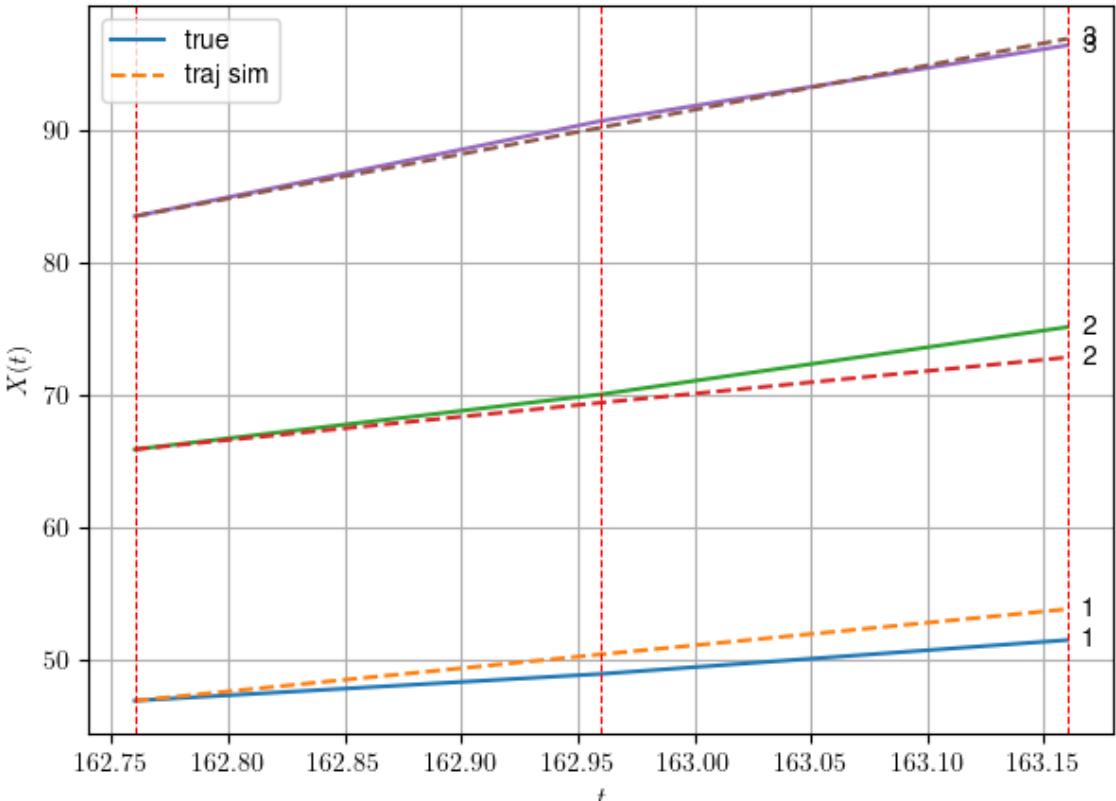
-----  

* err= 1.5267810102028658  

* Learning rate NN = 7.289998757187277e-05  

* diff = 0.0007670740072726962
-----
```

df n. 7 – Scene n. 3, at it = 350



For scene 3/8

```

* use LR_NN=0.0001 with err=1.9424029703929264 at it=19  

* v0_scn_mean = 33.21330933976166  

* MAE = 1.488848276108522
=====
```

```

-----  

- Time interval n.0: [165.76, 165.96]  

* y_true: [14.62535373 14.97522028]  

* v_ann: [14.14257526397705, 14.487004280090332, 2  

7.26222960772804]
-----
```

```

-----  

- Time interval n.1: [165.96, 166.16]  

* y_true: [14.90483904 10.97892299]  

* v_ann: [14.41775131225586, 14.6160888671875, 27.2  

6222960772804]
-----
```

```

-----  

- Time interval n.2: [166.16, 166.36]  

  * y_true: [13.82116599 15.66867879]  

  * v_ann: [13.55479907989502, 13.72256088256836, 27.  

26222960772804]  

-----
```

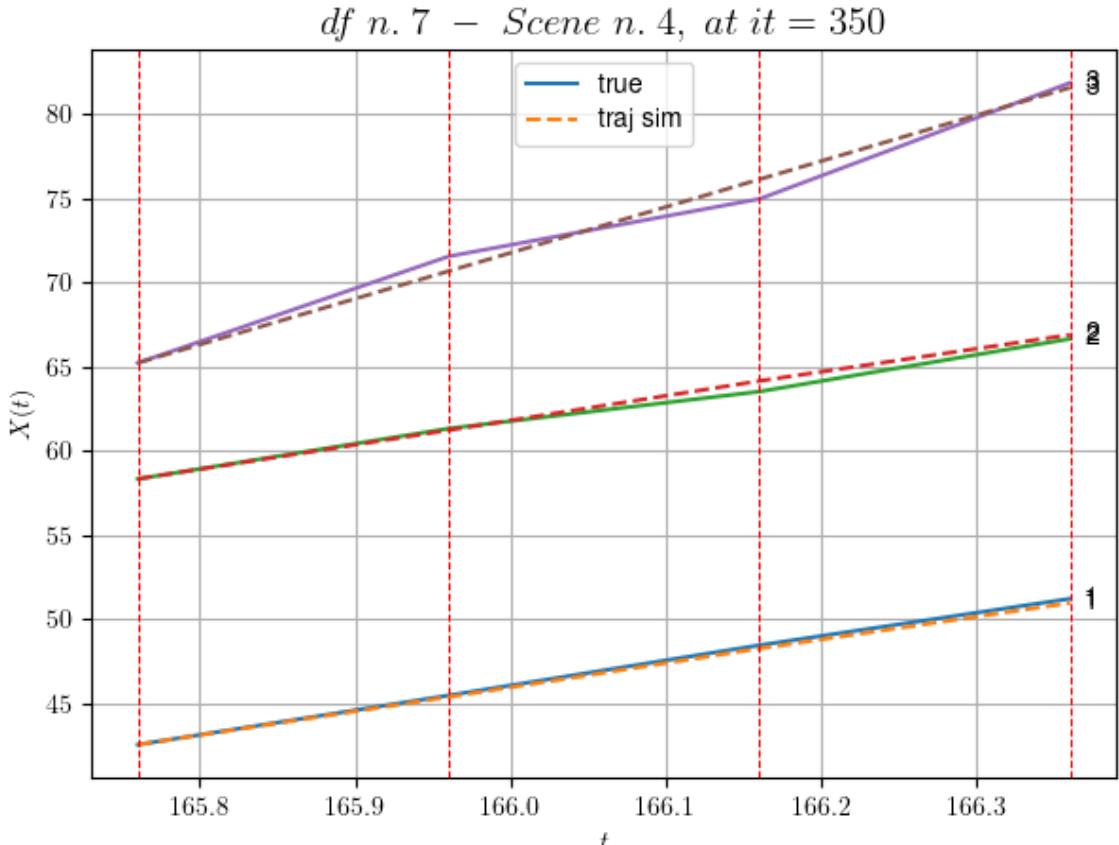
```

-----  

* err= 0.23131138433949996  

* Learning rate NN = 0.0005904899444431067  

* diff = 4.2830273057570256e-05
```



For scene 4/8

```

* use LR_NN=0.001 with err=1.4423883268349067 at it=19  

* v0_scn_mean = 27.49687579224644  

* MAE = 0.23131138433949996
```

```

=====  

-----  

- Time interval n.0: [188.16, 188.36]  

  * y_true: [18.26365072 21.2472937 ]  

  * v_ann: [20.8835391998291, 21.098026275634766, 24.  

898645104742375]
```

```

-----  

-----  

- Time interval n.1: [188.36, 188.56]  

  * y_true: [19.58083161 26.63811802]  

  * v_ann: [20.773984909057617, 20.953163146972656, 2  

4.898645104742375]
```

```

-----  

- Time interval n.2: [188.56, 188.76]  

  * y_true: [19.1135942 21.22632097]  

  * v_ann: [21.025205612182617, 21.244190216064453, 2  

  4.898645104742375]
-----
```

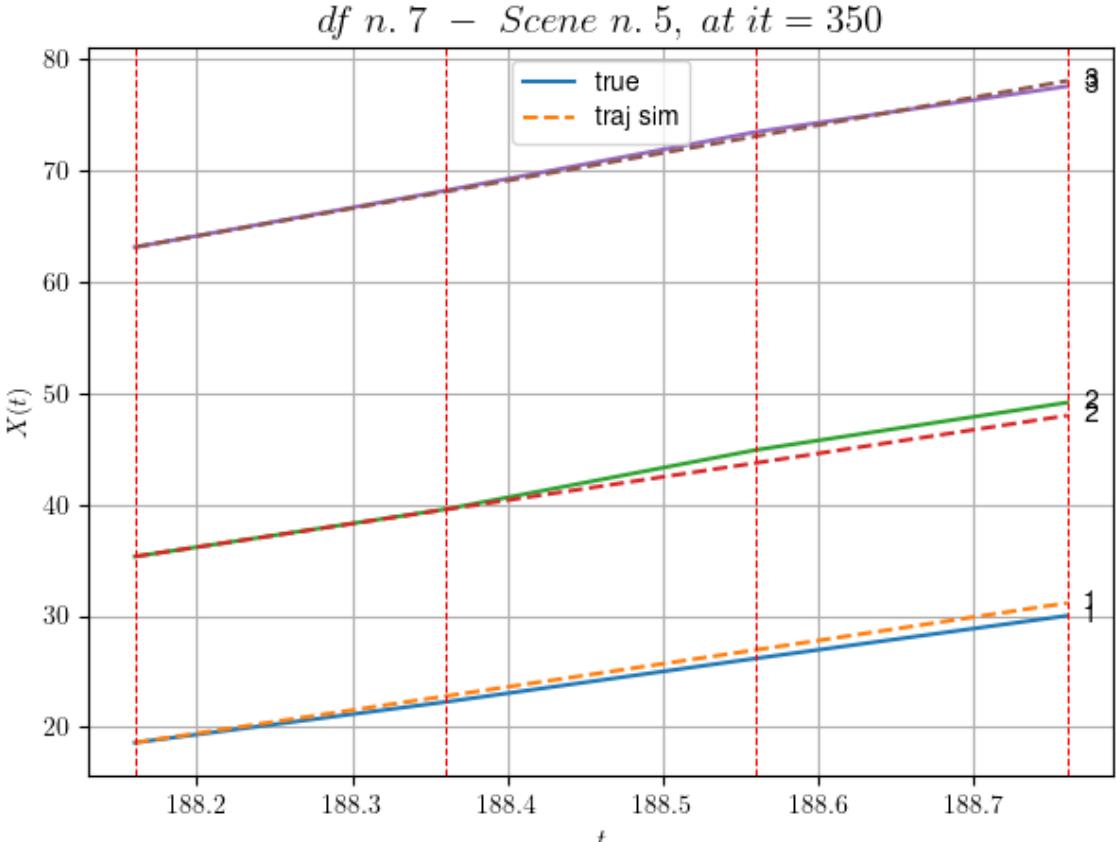
```

-----  

* err= 0.44128823797840727  

* Learning rate NN = 5.904899080633186e-05  

* diff = 0.0012746226853021514
-----
```



For scene 5/8

```

* use LR_NN=0.0001 with err=2.1560798396960337 at it=19  

* v0_scn_mean = 25.335867110438645  

* MAE = 0.363327667927343
=====
```

```

-----  

- Time interval n.0: [220.96, 221.16]  

  * y_true: [27.25777683 27.84910592]  

  * v_ann: [28.739328384399414, 29.227272033691406, 2  

  6.579870119515753]
-----
```

```

-----  

- Time interval n.1: [221.16, 221.36]  

  * y_true: [24.9447965 32.01250046]  

  * v_ann: [27.144920349121094, 26.829133987426758, 2  

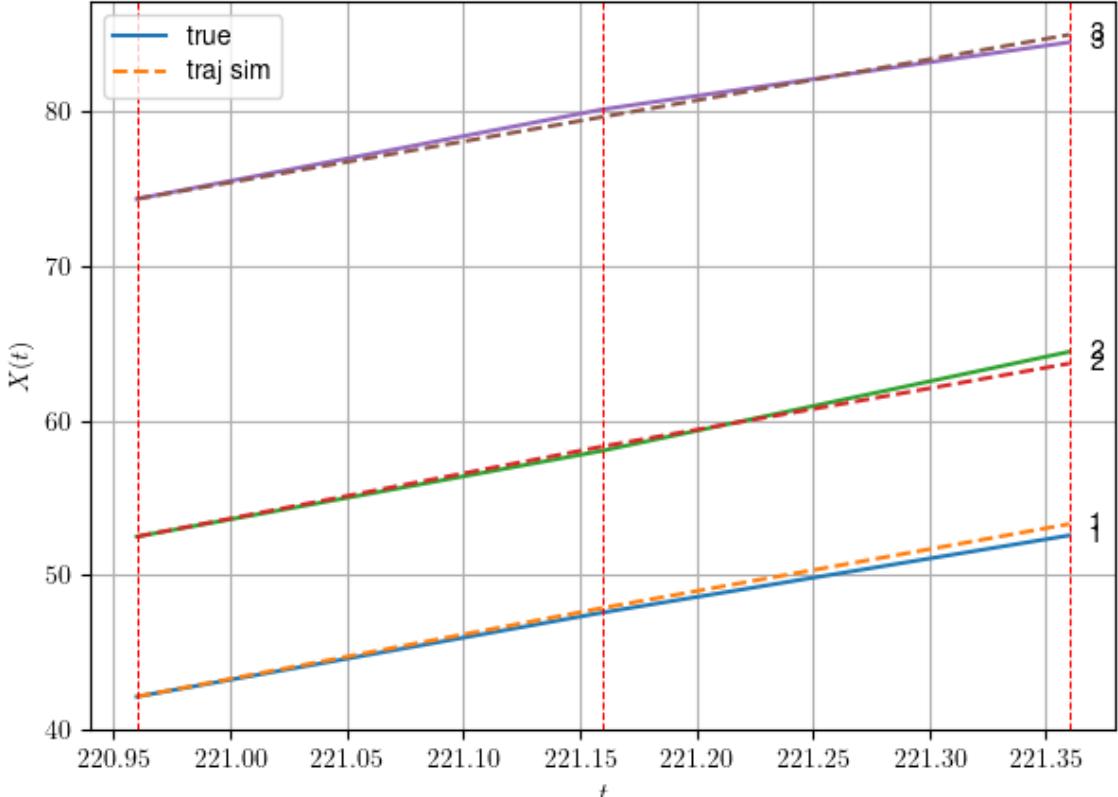
  6.579870119515753]
-----
```

```

* err= 0.1956069953359038
* Learning rate NN = 0.0007289999630302191
* diff = 3.7909337743669003e-06

```

*df n. 7 – Scene n. 6, at it = 350*



For scene 6/8

```

* use LR_NN=0.001 with err=3.073718789643824 at it=19
* v0_scn_mean = 26.87299931299283
* MAE = 0.1921957254973982

```

---



---

- Time interval n.0: [166.56, 166.76]  
\* y\_true: [17.24164345 15.73752306 15.58083022]  
\* v\_ann: [18.02902216796875, 17.971296310424805, 1  
7.996423721313477, 17.37043158542256]

---



---

- Time interval n.1: [166.76, 166.96]  
\* y\_true: [18.38470966 27.72552812 9.3330177 ]  
\* v\_ann: [16.692100524902344, 17.089494705200195, 1  
6.894025802612305, 17.37043158542256]

---



---

- Time interval n.2: [166.96, 167.16]  
\* y\_true: [16.02323775 24.97208403 13.98221987]  
\* v\_ann: [17.853073120117188, 17.84807777404785, 1  
7.850919723510742, 17.37043158542256]

```

-----  

    - Time interval n.3: [167.16, 167.36]  

      * y_true: [18.26534189 20.06151439 15.46259314]  

      * v_ ann: [18.22964096069336, 18.04283332824707, 18.  

150421142578125, 17.37043158542256]
-----
```

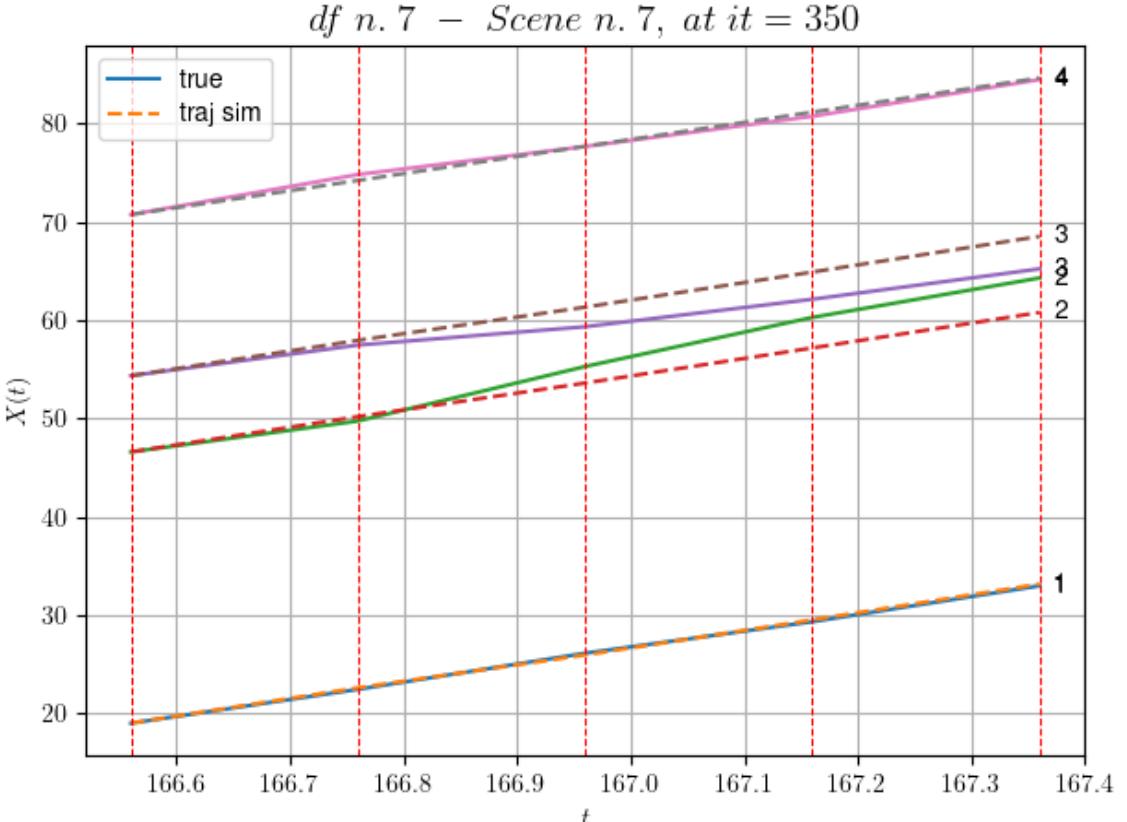
```

-----  

      * err= 2.4242985750660657  

      * Learning rate NN = 0.000478296831715852  

      * diff = 3.7984895606690827e-06
-----
```



For scene 7/8

```

* use LR_NN=0.001 with err=26.194751849368185 at it=19
* v0_scn_mean = 18.81197927795331
* MAE = 2.4127179751119545
=====
```

For df=7 with 8 scenes, time taken: 67.64

In df n.8/10 we have 21 scenes

```

=====
*****  

*****  

For scene 0/21
* use LR_NN=0.001 with err=18.16701131303655 at it=19
* v0_scn_mean = 18.29000811679546
* MAE = 1.5795717778803116
=====
```

```
=====
=====

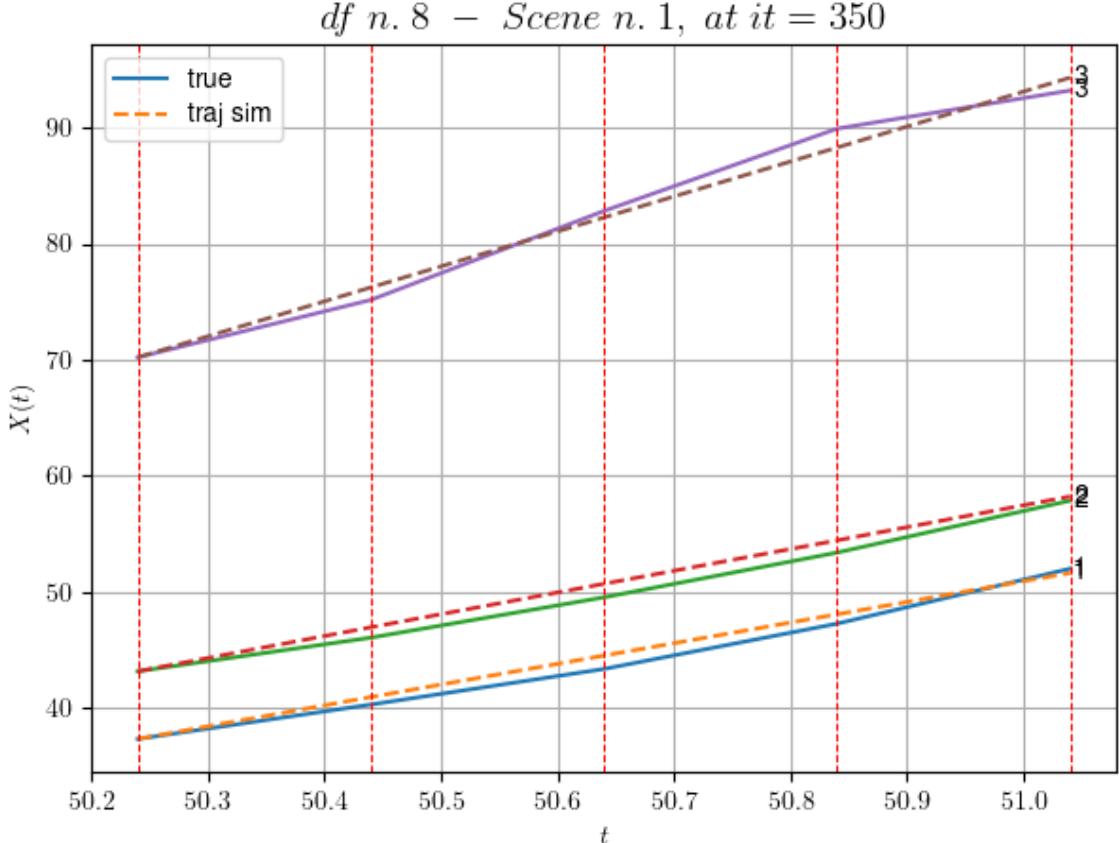
    - Time interval n.0: [50.24, 50.44]
        * y_true: [14.83043604 14.50055453]
        * v_ann: [18.068275451660156, 18.975391387939453, 3
0.157659834879066]

-----
    - Time interval n.1: [50.44, 50.64]
        * y_true: [15.35052738 17.38080918]
        * v_ann: [17.878629684448242, 18.748607635498047, 3
0.157659834879066]

-----
    - Time interval n.2: [50.64, 50.84]
        * y_true: [19.54078826 19.30097894]
        * v_ann: [17.796541213989258, 18.725040435791016, 3
0.157659834879066]

-----
    - Time interval n.3: [50.84, 51.04]
        * y_true: [23.72114006 22.40641196]
        * v_ann: [17.848987579345703, 18.92976951599121, 3
0.157659834879066]

-----
* err= 0.7535023555452626
* Learning rate NN = 4.7829678806010634e-05
* diff = 5.542697478766456e-06
```



For scene 1/21

\* use LR\_NN=0.0001 with err=14.348800342951208 at it=19  
 \* v0\_scn\_mean = 30.144147277795916  
 \* MAE = 0.6918606071256278

---



---

- Time interval n.0: [102.24, 102.44]
  - \* y\_true: [22.78095819 15.94092959]
  - \* v\_ann: [20.181676864624023, 20.242311477661133, 3 1.34828224079019]

---

- Time interval n.1: [102.44, 102.64]
  - \* y\_true: [23.36120187 12.10080168]
  - \* v\_ann: [20.09499740600586, 20.356124877929688, 3 1.34828224079019]

---

- Time interval n.2: [102.64, 102.84]
  - \* y\_true: [20.51121756 22.37162153]
  - \* v\_ann: [19.905803680419922, 20.274646759033203, 3 1.34828224079019]

---

- Time interval n.3: [102.84, 103.04]
  - \* y\_true: [23.62167761 20.76175162]
  - \* v\_ann: [19.978586196899414, 20.399864196777344, 3 1.34828224079019]

1.34828224079019]

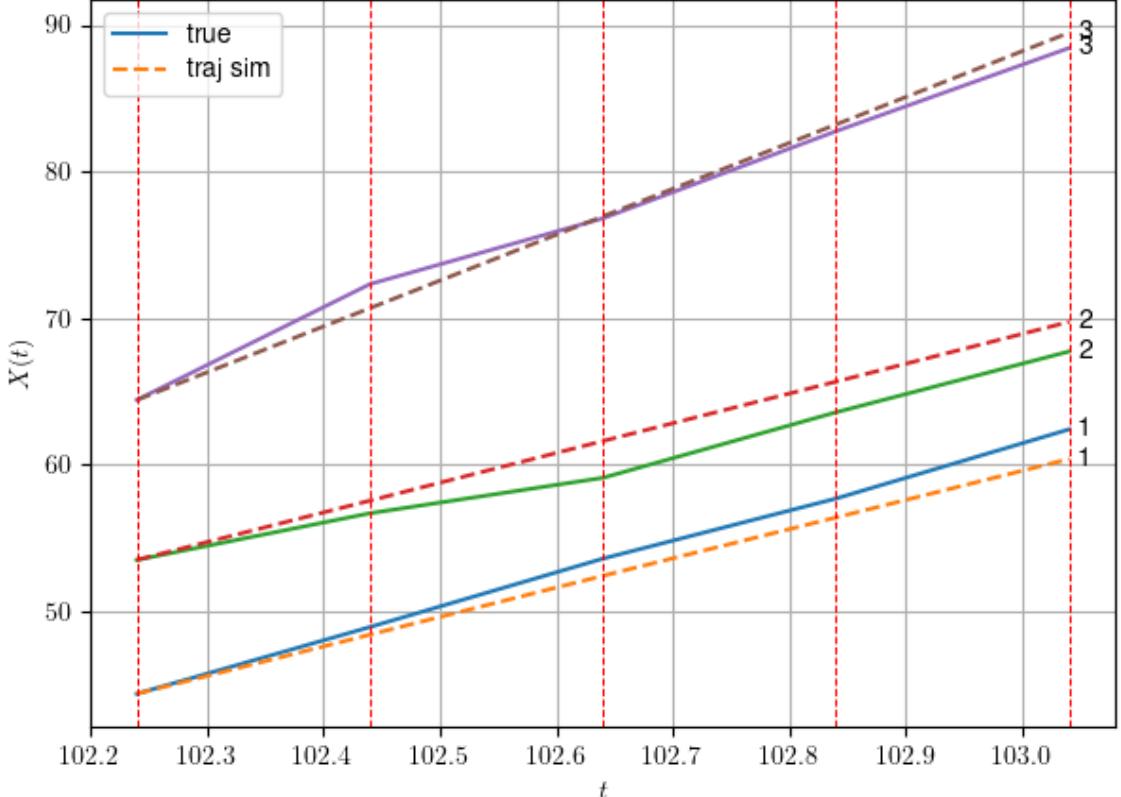
---



---

```
* err= 1.795316547558915
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.00038309095782107505
```

*df n. 8 – Scene n. 2, at it = 350*



For scene 2/21

```
* use LR_NN=0.0001 with err=13.118916245062081 at it=19
* v0_scn_mean = 31.232724966758735
* MAE = 1.795316547558915
```

---



---



---

- Time interval n.0: [108.84, 109.04]  
 \* y\_true: [17.9810803 26.65193678]  
 \* v\_ann: [20.825847625732422, 20.504470825195312, 2  
 0.549083403843422]

---



---



---

- Time interval n.1: [109.04, 109.24]  
 \* y\_true: [14.30252156 22.9019425 ]  
 \* v\_ann: [21.64151382446289, 21.545238494873047, 2  
 0.549083403843422]

---



---



---

- Time interval n.2: [109.24, 109.44]  
 \* y\_true: [21.24158827 21.25204953]  
 \* v\_ann: [19.97014808654785, 19.768665313720703, 2

0.549083403843422]

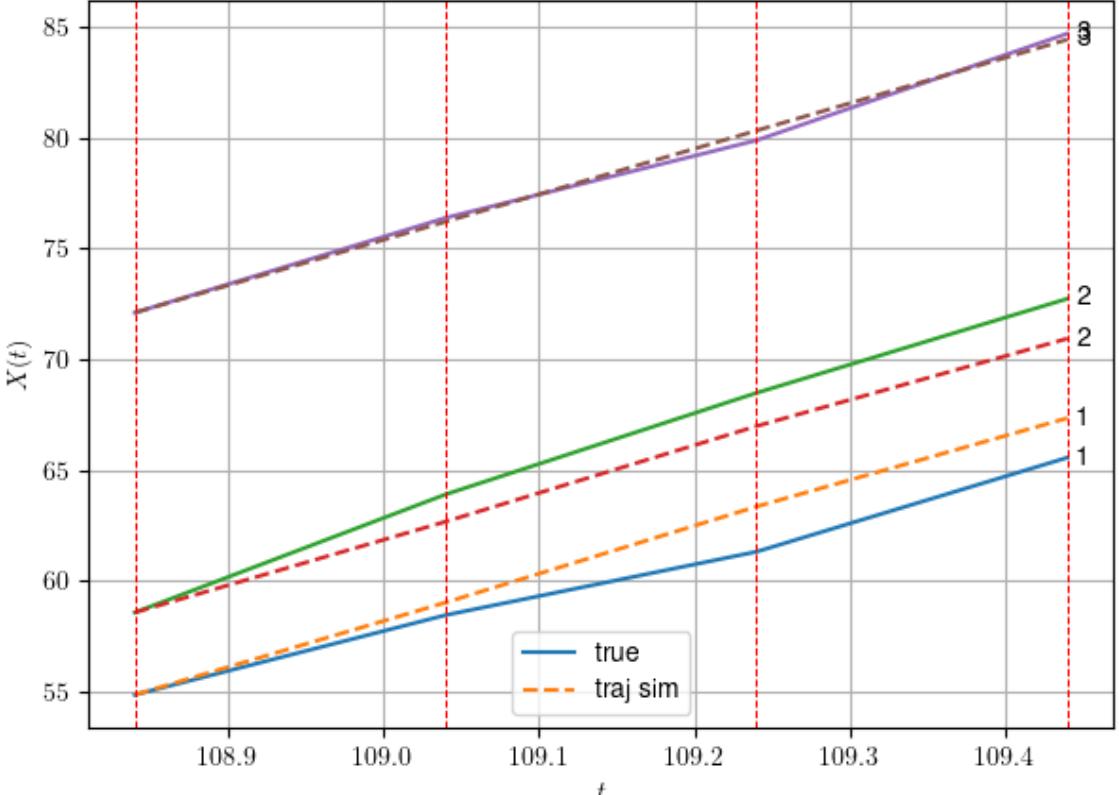
---



---

- \* err= 1.2450306835170102
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.000422957211934305

*df n. 8 – Scene n. 3, at it = 350*



For scene 3/21

- \* use LR\_NN=0.001 with err=6.339019265211557 at it=19
- \* v0\_scn\_mean = 21.359093449151494
- \* MAE = 1.2450306835170102

---



---

For scene 4/21

- \* use LR\_NN=0.0001 with err=10.131658449392411 at it=19
- \* v0\_scn\_mean = 40.08013629578427
- \* MAE = 0.06905759696514864

---



---

- Time interval n.0: [215.24, 215.44]  
 \* y\_true: [ 1.34614625 10.42531549]  
 \* v\_ann: [19.632244110107422, 20.894010543823242, 1  
 5.10079727046582]

---



---

- Time interval n.1: [215.44, 215.64]

```

* y_true: [18.28906766 10.32533879]
* v_ann: [14.905900955200195, 13.293567657470703, 1
5.10079727046582]

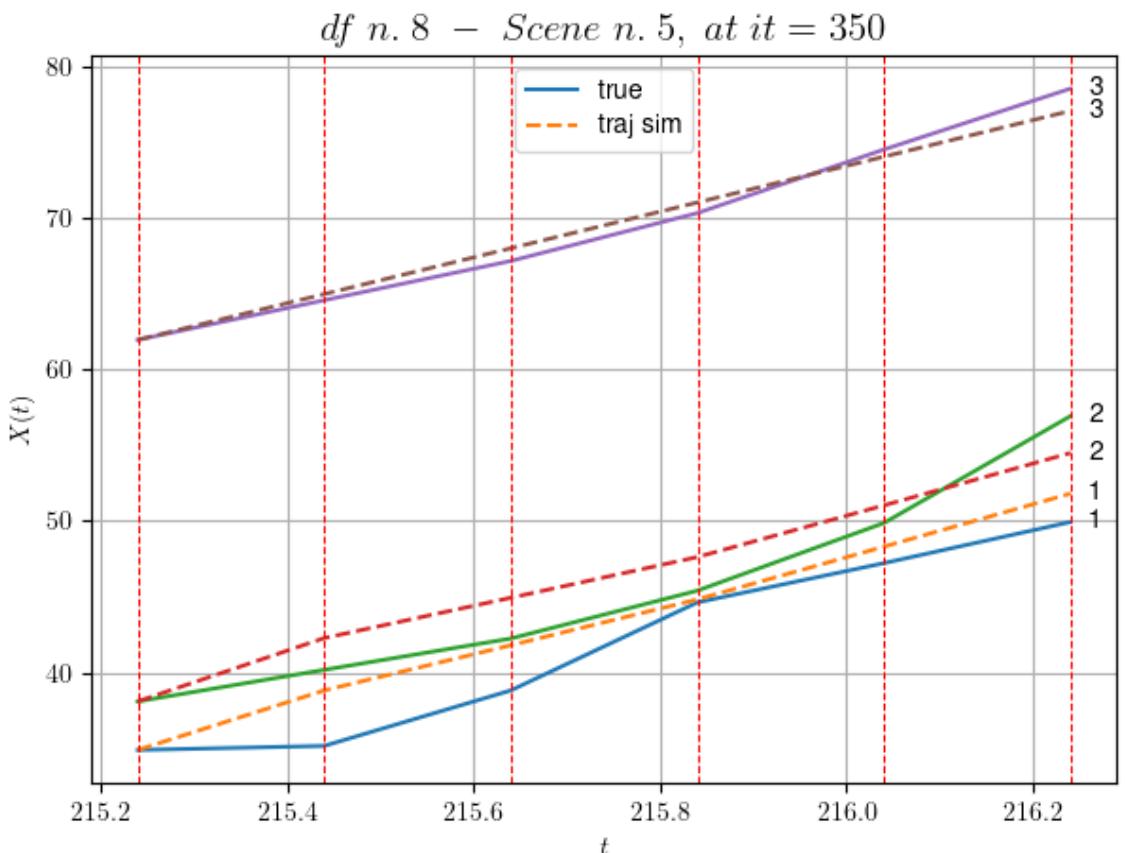
-----
- Time interval n.2: [215.64, 215.84]
* y_true: [29.02100933 15.78058213]
* v_ann: [15.097698211669922, 13.424864768981934, 1
5.10079727046582]

-----
- Time interval n.3: [215.84, 216.04]
* y_true: [12.95052595 22.3009853 ]
* v_ann: [17.40546989440918, 17.04143714904785, 15.
10079727046582]

-----
- Time interval n.4: [216.04, 216.24]
* y_true: [13.56563519 35.25195514]
* v_ann: [17.500825881958008, 17.273313522338867, 1
5.10079727046582]

-----
* err= 3.028032928761489
* Learning rate NN = 0.0003874204121530056
* diff = 0.00048386444509862514

```



For scene 5/21

```

* use LR_NN=0.001 with err=40.65590010042042 at it=19
* v0_scn_mean = 16.377763769452052

```

\* MAE = 3.028032928761489

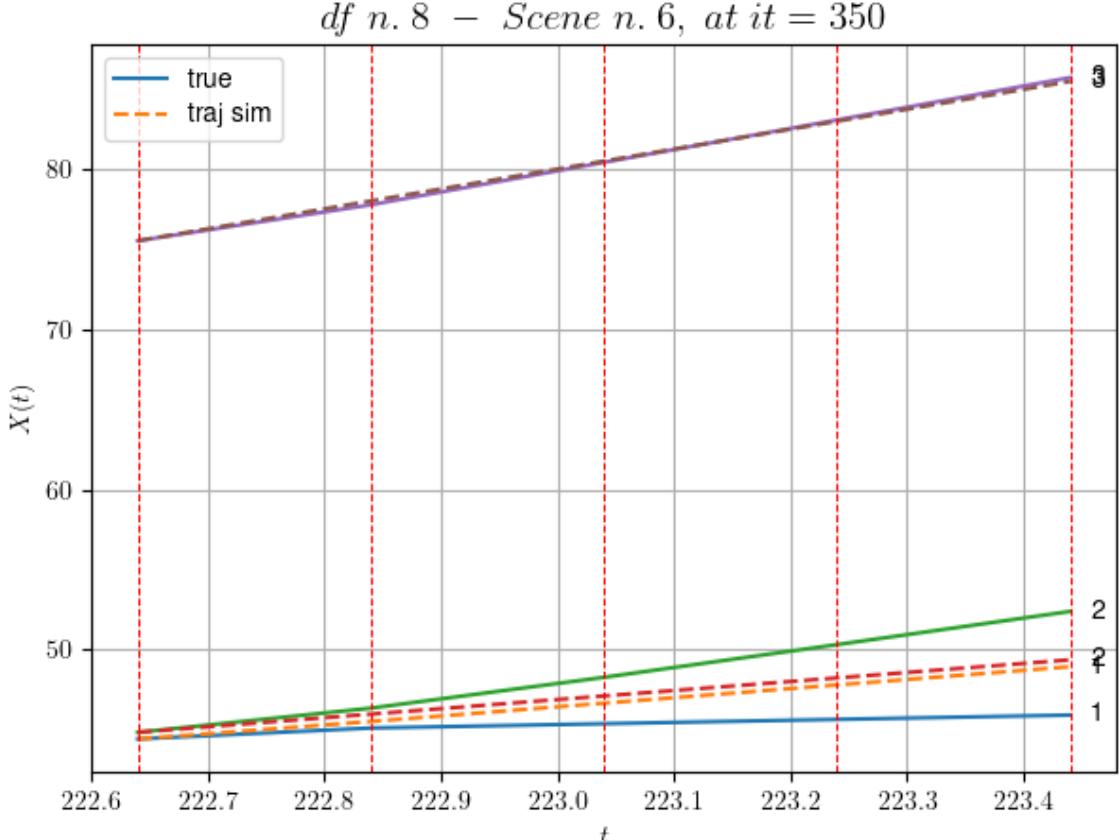
```
=====
=====
- Time interval n.0: [222.64, 222.84]
  * y_true: [3.4148313 7.54419185]
  * v_ann: [5.450466632843018, 5.684472560882568, 12.
28665091344943]

-----
-----
- Time interval n.1: [222.84, 223.04]
  * y_true: [1.34614625 9.61287691]
  * v_ann: [5.71796178817749, 5.664350986480713, 12.4
28665091344943]

-----
-----
- Time interval n.2: [223.04, 223.24]
  * y_true: [ 1.34614625 10.20300693]
  * v_ann: [5.6792073249816895, 5.623630523681641, 1
2.428665091344943]

-----
-----
- Time interval n.3: [223.24, 223.44]
  * y_true: [ 1.34614625 10.35053943]
  * v_ann: [5.696916103363037, 5.646533489227295, 12.
428665091344943]

-----
-----
* err= 2.0382486602742493
* Learning rate NN = 0.000239148415857926
* diff = 1.370773979836315e-05
```



For scene 6/21

- \* use LR\_NN=0.0005 with err=25.22000810112819 at it=19
- \* v0\_scn\_mean = 13.934652118177096
- \* MAE = 2.036512864622349

---



---

- Time interval n.0: [225.24, 225.44]
- \* y\_true: [9.85023046 1.34614625]
- \* v\_ann: [9.904397964477539, 9.829791069030762, 13.143805199617319]

---

- Time interval n.1: [225.44, 225.64]
- \* y\_true: [11.30531094 1.34614625]
- \* v\_ann: [8.635886192321777, 8.329422950744629, 13.143805199617319]

---

- Time interval n.2: [225.64, 225.84]
- \* y\_true: [12.27536459 1.34614625]
- \* v\_ann: [8.086935043334961, 7.591662406921387, 13.143805199617319]

---

- Time interval n.3: [225.84, 226.04]
- \* y\_true: [16.30233516 1.34614625]
- \* v\_ann: [7.877254962921143, 7.220182418823242, 13.]

---

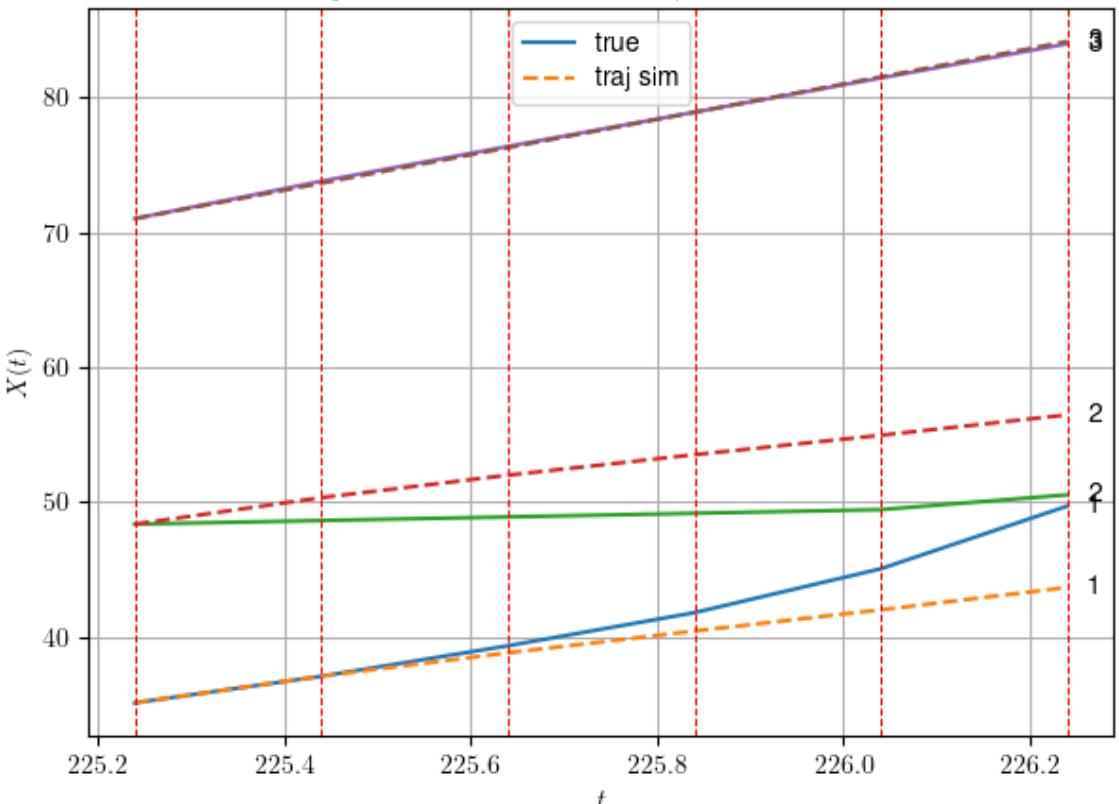
143805199617319]

```
- Time interval n.4: [226.04, 226.24]
  * y_true: [23.251759 5.49560672]
  * v_ann: [8.289806365966797, 7.563882350921631, 13.
```

143805199617319]

```
* err= 8.047447811939294
* Learning rate NN = 0.0003874204121530056
* diff = 0.004157338433227409
```

df n. 8 – Scene n. 7, at it = 350



For scene 7/21

```
* use LR_NN=0.001 with err=52.4297696636282 at it=19
* v0_scn_mean = 14.588499687719558
* MAE = 7.588547044803232
```

```
- Time interval n.0: [227.04, 227.24]
  * y_true: [ 1.34614625 11.86069537]
  * v_ann: [7.162720680236816, 7.802738666534424, 26.
```

24318261171468]

```
- Time interval n.1: [227.24, 227.44]
  * y_true: [ 1.34614625 11.90074479]
  * v_ann: [6.94191312789917, 7.518592357635498, 26.2
```

4318261171468]

```
- Time interval n.2: [227.44, 227.64]
  * y_true: [ 1.34614625 14.03099458]
  * v_ann: [6.808216094970703, 7.46502161026001, 26.2
```

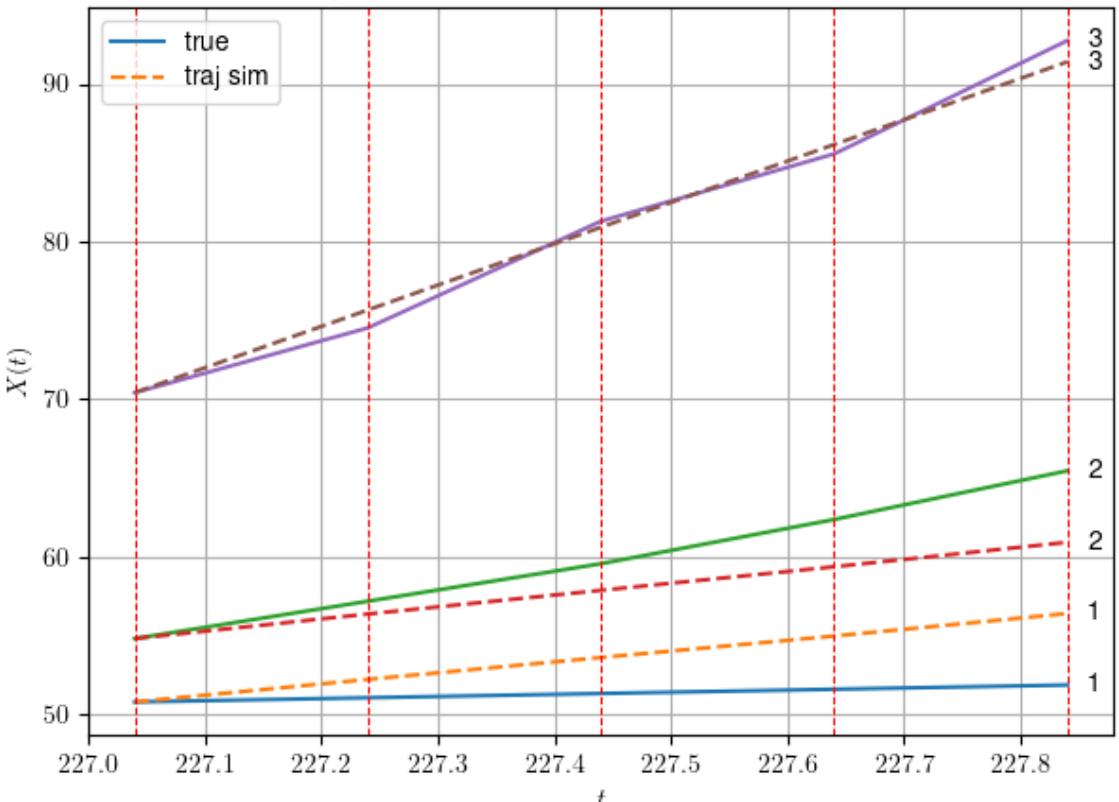
4318261171468]

```
- Time interval n.3: [227.64, 227.84]
  * y_true: [ 1.34614625 15.45116111]
  * v_ann: [7.1499810218811035, 7.781902313232422, 2
```

6.24318261171468]

```
* err= 5.014741236432196
* Learning rate NN = 0.000478296831715852
* diff = 0.00039574293136546146
```

df n. 8 – Scene n. 8, at it = 350



For scene 8/21

```
* use LR_NN=0.001 with err=2.9460411620356246 at it=19
* v0_scn_mean = 26.56516829341416
* MAE = 5.010904036124747
```

```
- Time interval n.0: [237.64, 237.84]
  * y_true: [17.80043487 10.22573725]
  * v_ann: [15.716849327087402, 15.414022445678711, 2
```

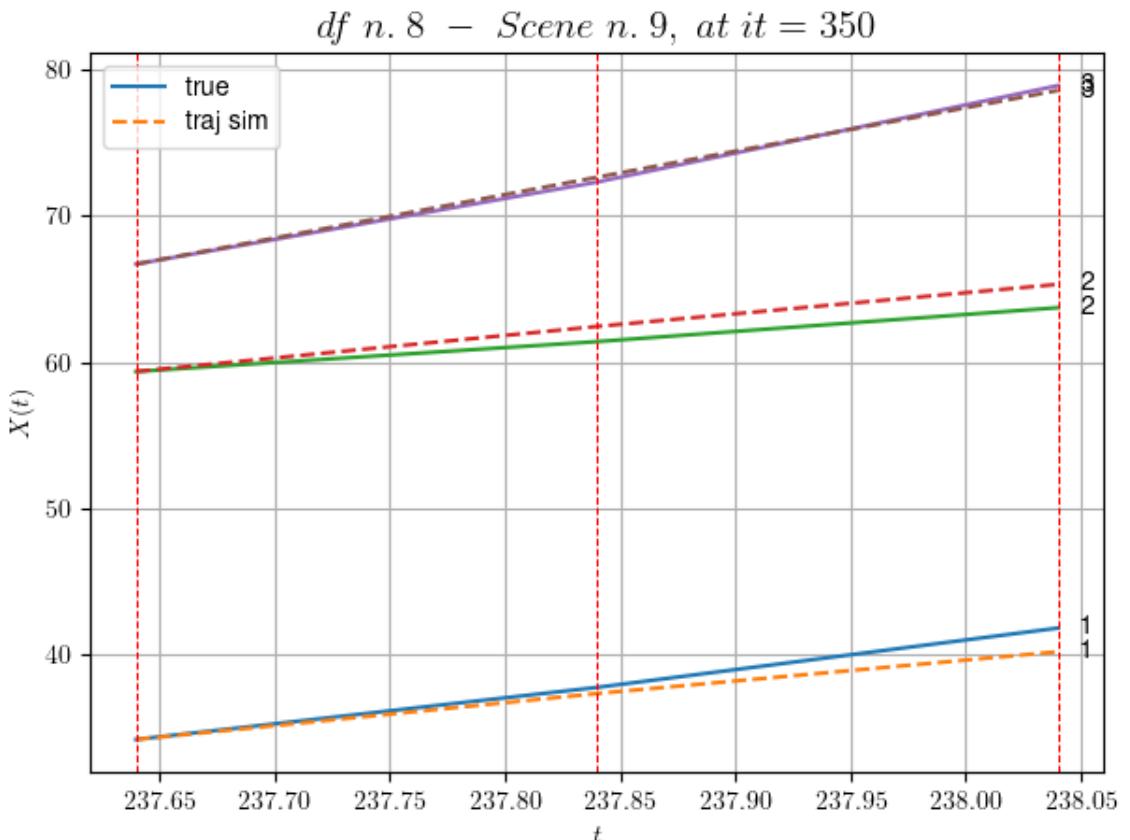
9.702969638681846]

---

- Time interval n.1: [237.84, 238.04]
  - \* y\_true: [20.29063338 11.60088234]
  - \* v\_ann: [14.28746509552002, 14.40438175201416, 29.702969638681846]

---

- \* err= 0.7376493114258468
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 7.383456858800486e-06



For scene 9/21

- \* use LR\_NN=0.001 with err=0.43446965288364153 at it=19
- \* v0\_scn\_mean = 29.728427230438378
- \* MAE = 0.4057780426805218

---



---

For scene 10/21

- \* use LR\_NN=0.0005 with err=4.235236383575253 at it=19
- \* v0\_scn\_mean = 30.114128375535604
- \* MAE = 0.058895304463964876

---



---

- Time interval n.0: [243.44, 243.64]

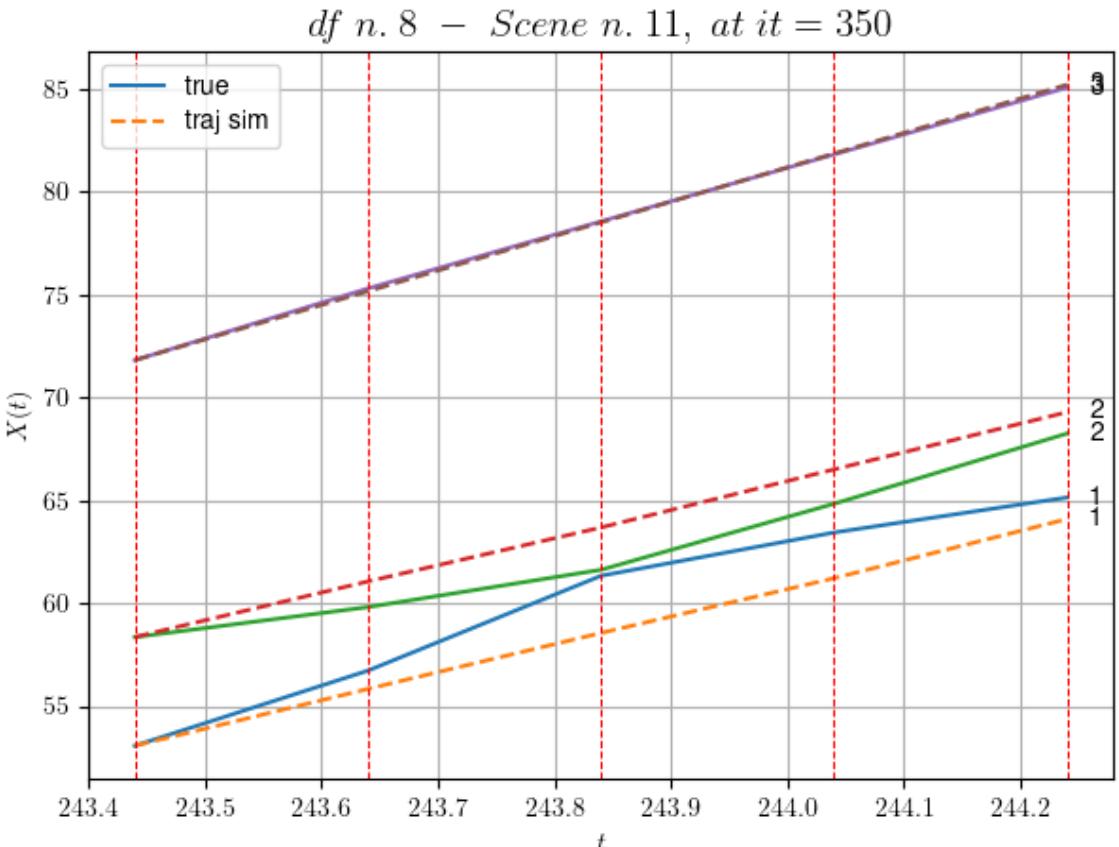
```
* y_true: [18.26109982  7.28715228]
* v_ann: [13.8164701461792, 13.524211883544922, 16.
743010063526963]
```

```
- Time interval n.1: [243.64, 243.84]
* y_true: [23.05153691  9.06731774]
* v_ann: [13.601067543029785, 13.113937377929688, 1
6.743010063526963]
```

```
- Time interval n.2: [243.84, 244.04]
* y_true: [10.52334632 16.05532609]
* v_ann: [13.311562538146973, 14.119629859924316, 1
6.743010063526963]
```

```
- Time interval n.3: [244.04, 244.24]
* y_true: [ 8.51398229 17.08146048]
* v_ann: [14.393986701965332, 13.917839050292969, 1
6.743010063526963]
```

```
* err= 1.615593526967648
* Learning rate NN = 0.000478296831715852
* diff = 8.32690028578220e-05
```



For scene 11/21

```
* use LR_NN=0.001 with err=26.08110377750309 at it=19
* v0_scn_mean = 17.879227372169584
```

\* MAE = 1.6050653438870492

```
=====
=====
- Time interval n.0: [251.64, 251.84]
  * y_true: [14.32016282 17.2315068 ]
  * v_ann: [13.413105010986328, 15.582756042480469, 1
9.824979611544876]

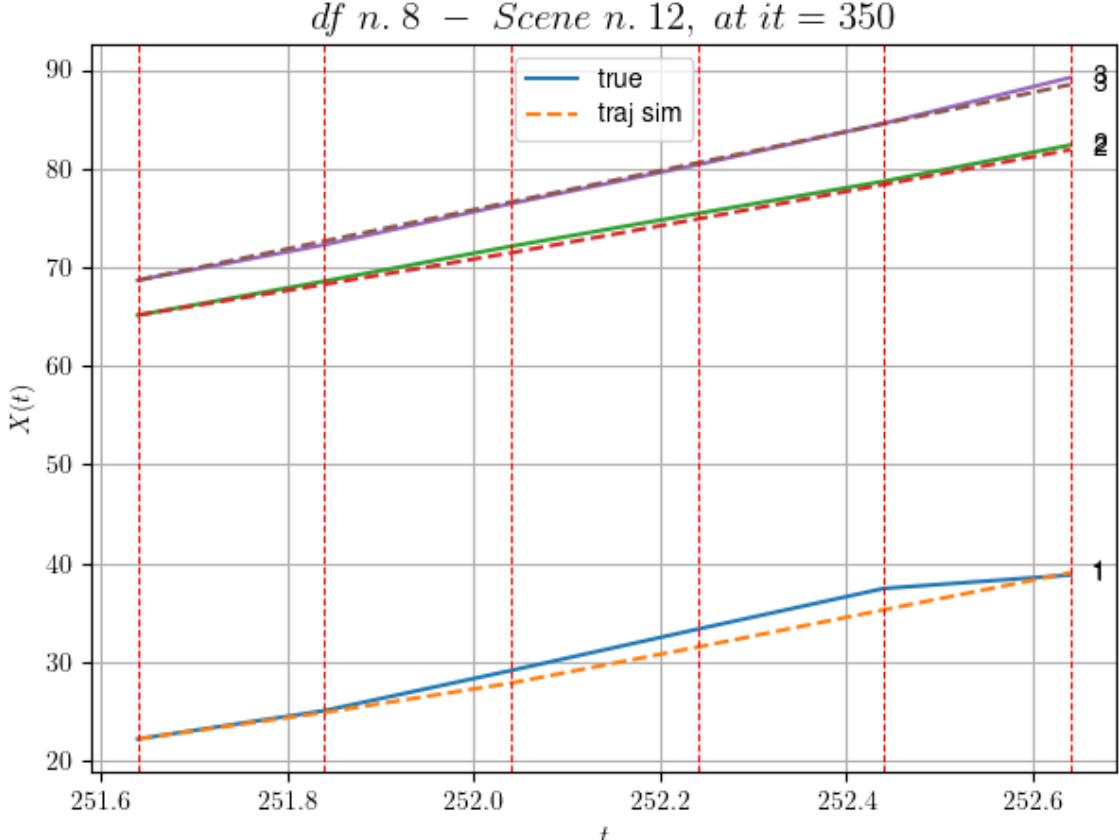
-----
-----
- Time interval n.1: [251.84, 252.04]
  * y_true: [20.34029568 17.65159646]
  * v_ann: [14.873981475830078, 15.977401733398438, 1
9.824979611544876]

-----
-----
- Time interval n.2: [252.04, 252.24]
  * y_true: [20.93040622 16.61174803]
  * v_ann: [18.211137771606445, 17.134140014648438, 1
9.824979611544876]

-----
-----
- Time interval n.3: [252.24, 252.44]
  * y_true: [20.66049541 16.35178592]
  * v_ann: [18.940580368041992, 17.511940002441406, 1
9.824979611544876]

-----
-----
- Time interval n.4: [252.44, 252.64]
  * y_true: [ 6.80019415 18.37232882]
  * v_ann: [18.804370880126953, 17.595264434814453, 1
9.824979611544876]

-----
* err= 0.6458193221956047
* Learning rate NN = 0.0003874204121530056
* diff = 3.4501430230537977e-06
```



For scene 12/21

- \* use LR\_NN=0.001 with err=36.04151944971287 at it=19
- \* v0\_scn\_mean = 20.69705044636904
- \* MAE = 0.6457215635699043

---



---

- Time interval n.0: [290.84, 291.04]
- \* y\_true: [10.67508652 21.71084933]
- \* v\_ann: [16.326229095458984, 17.60530662536621, 2  
5.378277675805226]

---

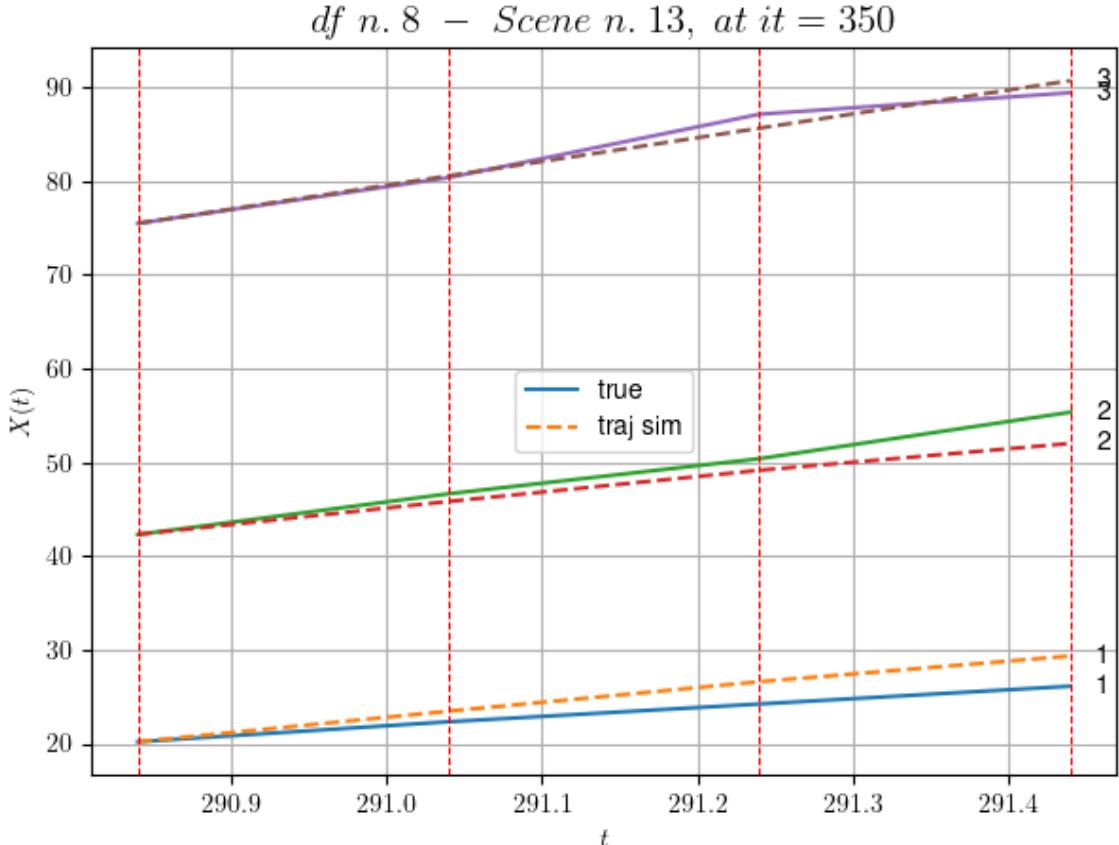
- Time interval n.1: [291.04, 291.24]
- \* y\_true: [ 9.47510968 18.71084105]
- \* v\_ann: [15.715596199035645, 16.62525177001953, 2  
5.378277675805226]

---

- Time interval n.2: [291.24, 291.44]
- \* y\_true: [ 9.47510968 24.76138307]
- \* v\_ann: [13.741147994995117, 14.319968223571777, 2  
5.378277675805226]

---

- \* err= 2.882150454992409
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.000910676695935031



For scene 13/21

```
* use LR_NN=0.001 with err=2.2584470025662395 at it=19
* v0_scn_mean = 25.77439179565114
* MAE = 2.858433037308508
```

---



---

- Time interval n.0: [350.64, 350.84]
  - \* y\_true: [14.24956692 9.34769854]
  - \* v\_ann: [15.784603118896484, 16.52347183227539, 2 4.0175992597937]

---

- Time interval n.1: [350.84, 351.04]
  - \* y\_true: [ 4.06677119 24.77080184]
  - \* v\_ann: [15.625553131103516, 16.424846649169922, 2 4.0175992597937]

---

- Time interval n.2: [351.04, 351.24]
  - \* y\_true: [15.46321179 18.97073364]
  - \* v\_ann: [15.694074630737305, 16.29877281188965, 2 4.0175992597937]

---

- Time interval n.3: [351.24, 351.44]
  - \* y\_true: [19.89069297 18.71086293]
  - \* v\_ann: [15.753334999084473, 16.414756774902344, 2 4.0175992597937]

4.0175992597937]

---

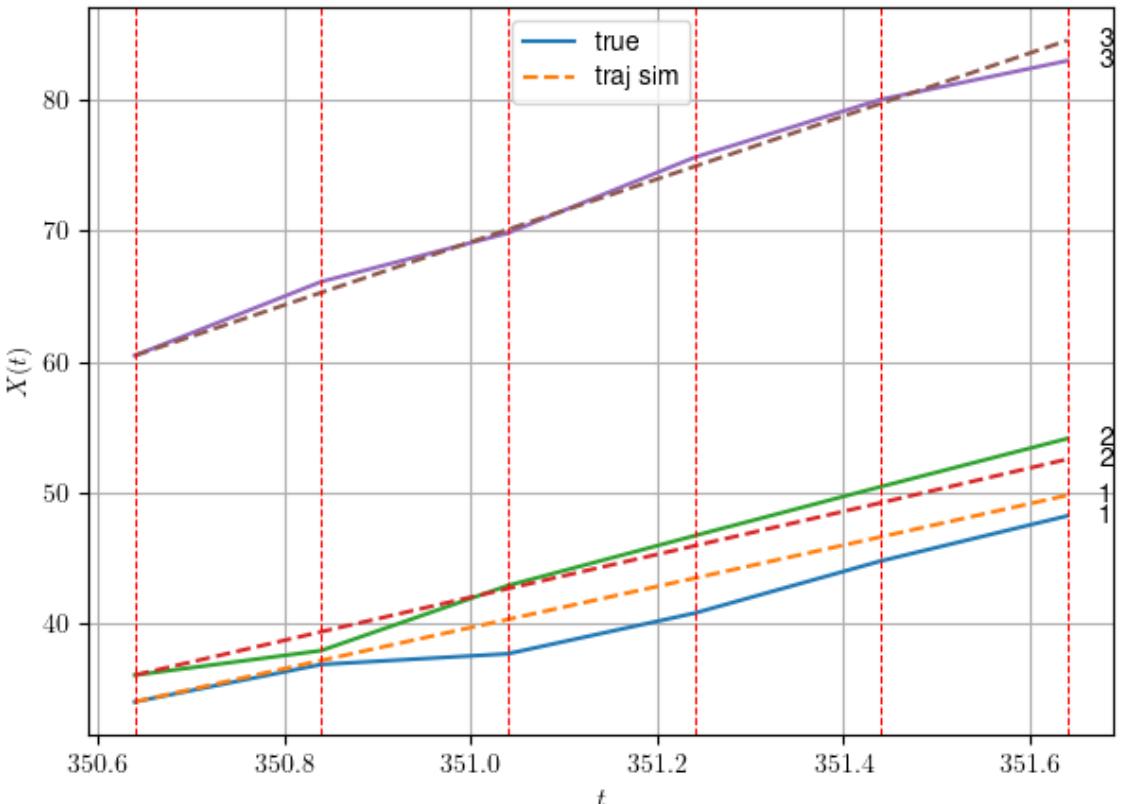
- Time interval n.4: [351.44, 351.64]
  - \* y\_true: [17.2007296 18.34097485]
  - \* v\_ann: [15.853957176208496, 16.612459182739258, 2

4.0175992597937]

---

- \* err= 1.6832562751392786
- \* Learning rate NN = 3.874203684972599e-05
- \* diff = 1.1864444303455457e-05

*df n. 8 – Scene n. 14, at it = 350*



For scene 14/21

- \* use LR\_NN=0.0001 with err=17.316392187071447 at it=19
- \* v0\_scn\_mean = 24.53033309310227
- \* MAE = 1.6832562751392786

---



---



---

- Time interval n.0: [368.84, 369.04]
  - \* y\_true: [17.45059381 8.87536169]
  - \* v\_ann: [14.300031661987305, 13.006009101867676, 1

7.012105849841017]

---

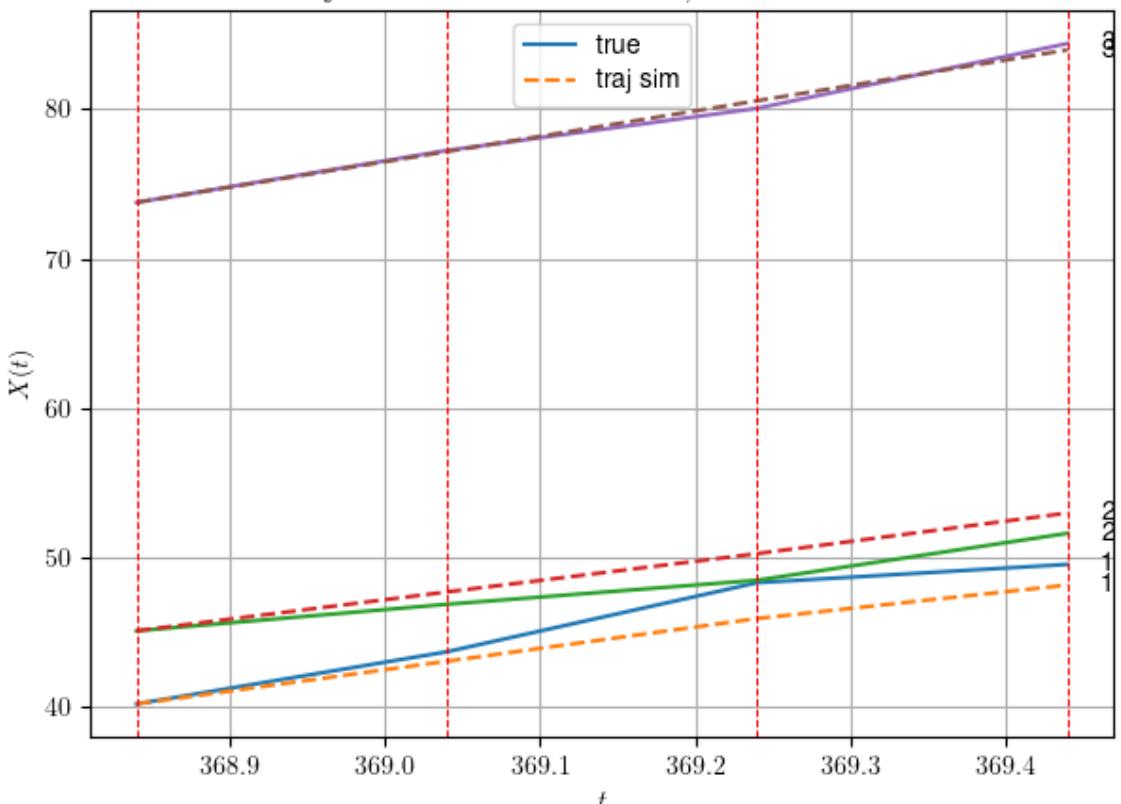
- Time interval n.1: [369.04, 369.24]
  - \* y\_true: [23.11801305 8.05829994]
  - \* v\_ann: [14.292251586914062, 12.817272186279297, 1

7.012105849841017]

```
- Time interval n.2: [369.24, 369.44]
  * y_true: [ 6.12528304 15.69072344]
  * v_ann: [11.203667640686035, 13.597108840942383, 1
7.012105849841017]
```

```
* err= 1.1814764370756123
* Learning rate NN = 0.0002952449722215533
* diff = 0.0003764103611842984
```

*df n. 8 – Scene n. 15, at it = 350*



For scene 15/21

```
* use LR_NN=0.0005 with err=19.48364380475655 at it=19
* v0_scn_mean = 18.12525975634212
* MAE = 1.1777808569334582
```

```
=====
=====
- Time interval n.0: [414.44, 414.64]
  * y_true: [25.58017481 23.93124381]
  * v_ann: [22.00704574584961, 21.50175666809082, 14.
740338902151922]
```

```
=====
=====
- Time interval n.1: [414.64, 414.84]
  * y_true: [28.7103211 9.12051681]
  * v_ann: [22.278371810913086, 21.576948165893555, 1
```

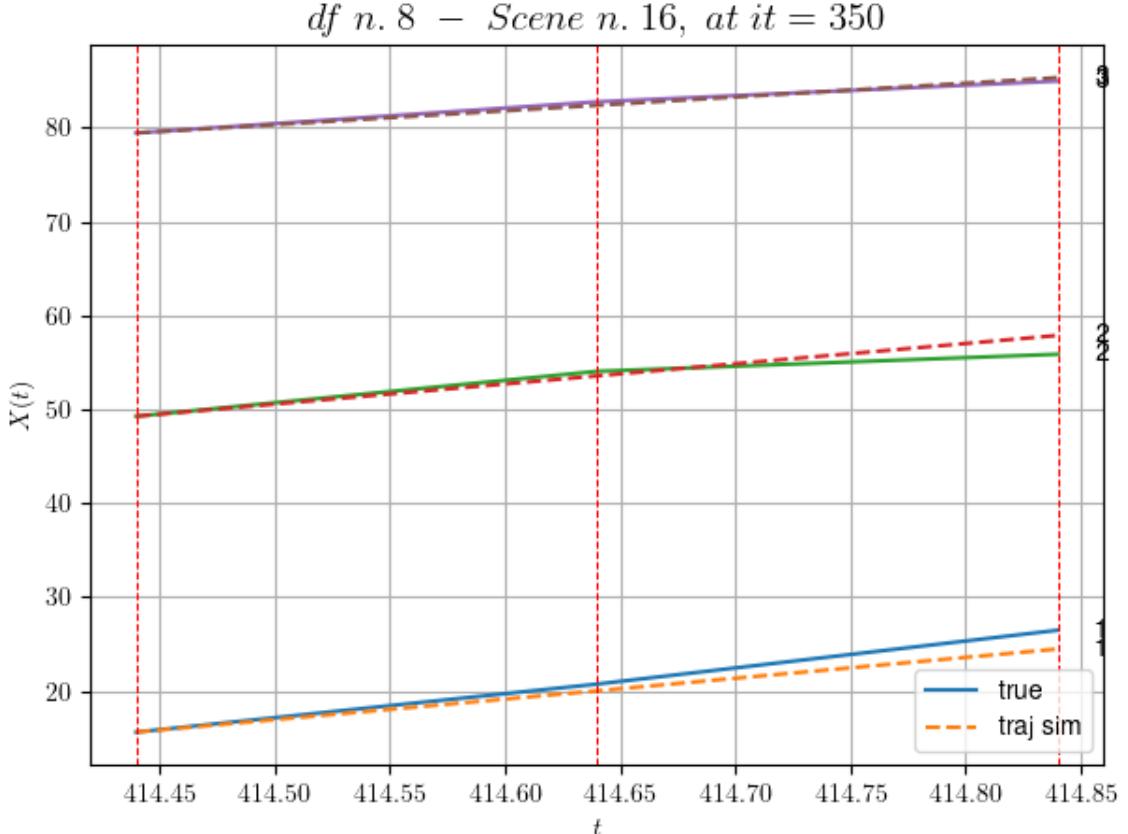
4.740338902151922]

---



---

- \* err= 1.0053653233340796
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 0.00018641219673920517



For scene 16/21

- \* use LR\_NN=5e-05 with err=6.072603490378711 at it=19
- \* v0\_scn\_mean = 16.048199219348838
- \* MAE = 1.0053653233340796

---



---

- Time interval n.0: [477.84, 478.04]  
 \* y\_true: [17.90015387 15.74042221]  
 \* v\_ann: [18.914369583129883, 19.02136993408203, 2  
 1.268222396992396]

---

- Time interval n.1: [478.04, 478.24]  
 \* y\_true: [18.02021575 17.32056356]  
 \* v\_ann: [18.311981201171875, 18.182022094726562, 2  
 1.268222396992396]

---

- Time interval n.2: [478.24, 478.44]  
 \* y\_true: [20.95033635 22.3908747 ]  
 \* v\_ann: [18.16026496887207, 17.964448928833008, 2

1.268222396992396]

---

- Time interval n.3: [478.44, 478.64]
  - \* y\_true: [19.80040923 17.17076636]
  - \* v\_ann: [19.14830780029297, 19.385244369506836, 2

1.268222396992396]

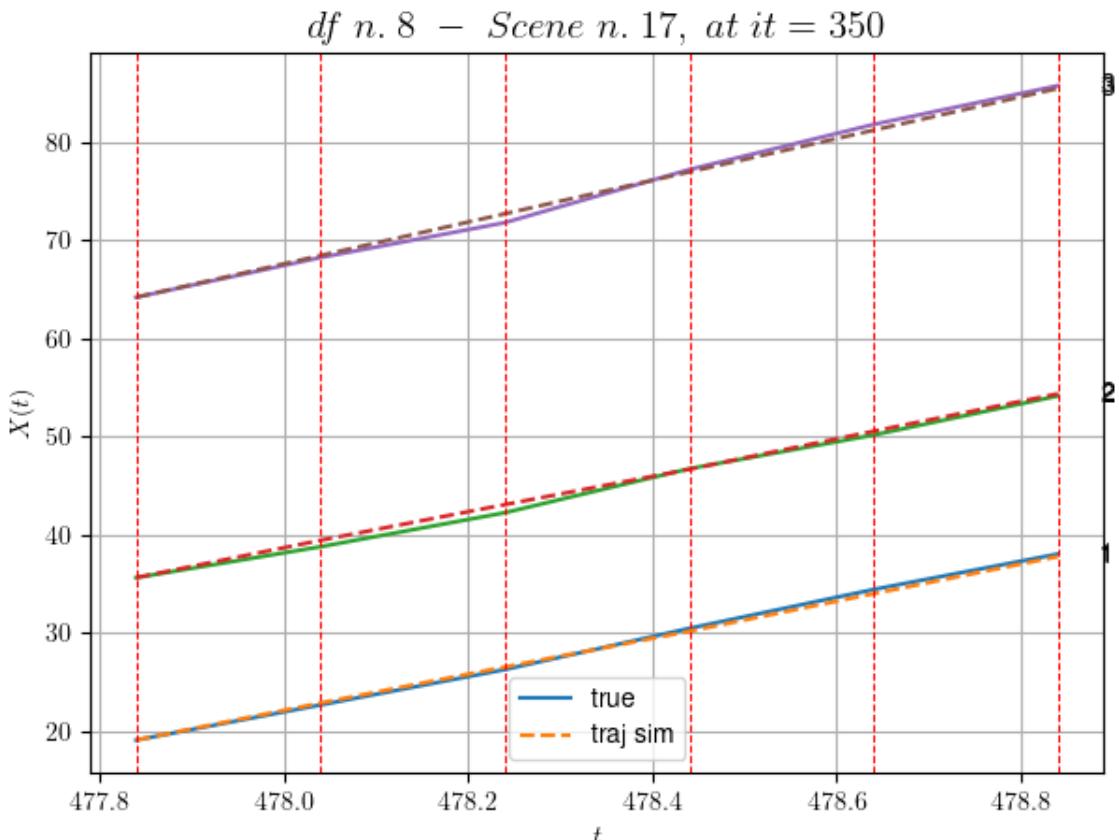
---

- Time interval n.4: [478.64, 478.84]
  - \* y\_true: [18.07046469 19.89107551]
  - \* v\_ann: [18.91184425354004, 19.057588577270508, 2

1.268222396992396]

---

- \* err= 0.1730831460696022
- \* Learning rate NN = 0.0001937102060765028
- \* diff = 1.5718002638165363e-05



For scene 17/21

- \* use LR\_NN=0.0005 with err=15.647191680285749 at it=19
- \* v0\_scn\_mean = 22.016597171001827
- \* MAE = 0.16664135917729048

---



---

- Time interval n.0: [522.64, 522.84]
  - \* y\_true: [ 6.78505349 16.71042372]
  - \* v\_ann: [13.570564270019531, 13.923514366149902, 2

5.1560078847199]

---

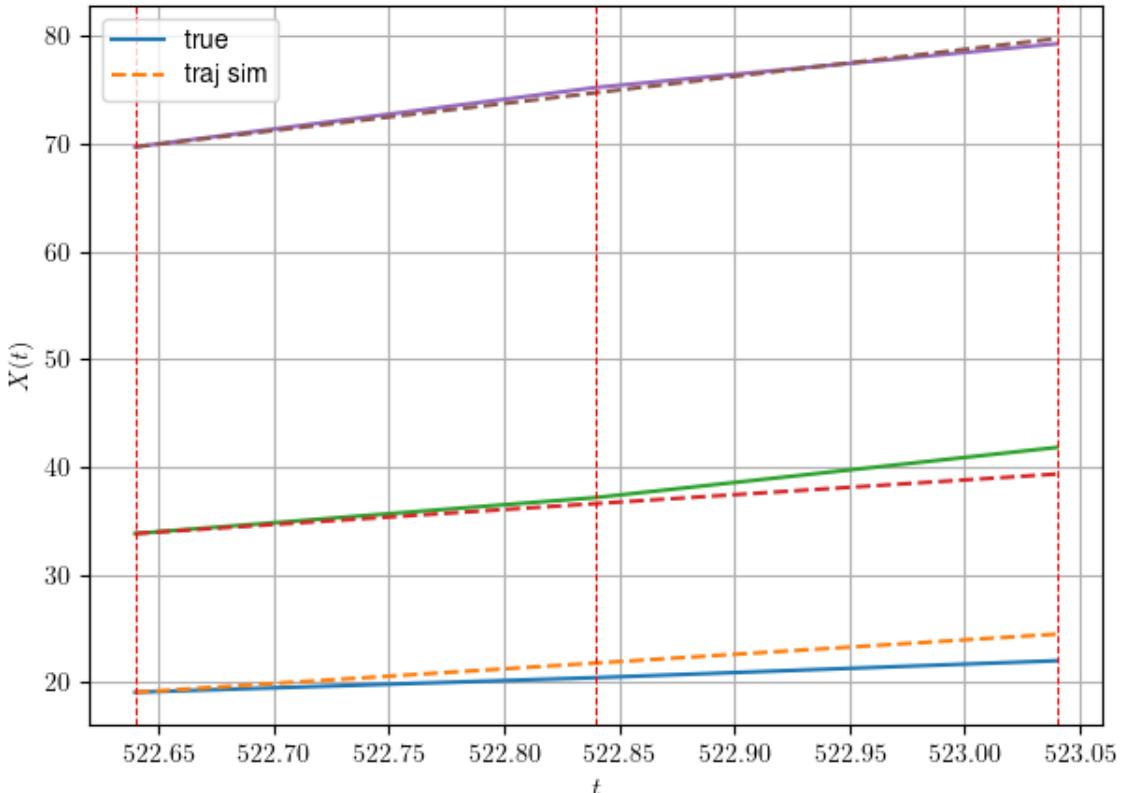
- Time interval n.1: [522.84, 523.04]
  - \* y\_true: [ 7.85007105 23.28071684]
  - \* v\_ann: [13.431187629699707, 13.702947616577148, 2

5.1560078847199]

---

- \* err= 1.6511333543788254
  - \* Learning rate NN = 7.289998757187277e-05
  - \* diff = 0.001479093251777197

*df n. 8 – Scene n. 18, at it = 350*



For scene 18/21

- \* use LR\_NN=0.0001 with err=0.8880333315878918 at it=19
- \* v0\_scn\_mean = 25.571172089468103
- \* MAE = 1.6511333543788254

---

For scene 19/21

- \* use LR\_NN=0.001 with err=30.886879768224272 at it=19
- \* v0\_scn\_mean = 21.375739761490316
- \* MAE = 4.514897304223357

---

- Time interval n.0: [256.44, 256.64]

```

* y_true: [ 7.48303167 10.07767618 21.73093279]
* v_ann: [11.652874946594238, 14.320024490356445, 1
5.442960739135742, 17.10609187367722]

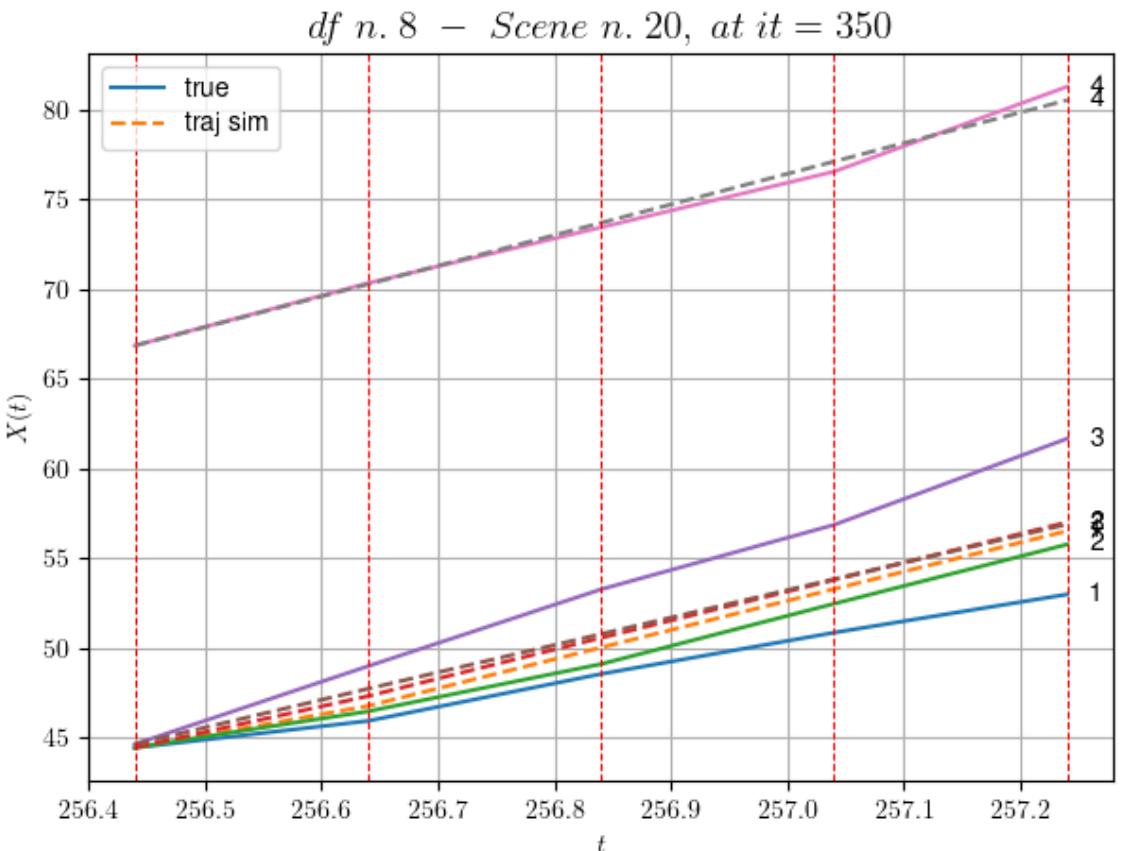
-----
- Time interval n.1: [256.64, 256.84]
* y_true: [13.09283525 13.17831107 21.42106847]
* v_ann: [16.29656219482422, 16.246864318847656, 1
5.242761611938477, 17.10609187367722]

-----
- Time interval n.2: [256.84, 257.04]
* y_true: [11.5255681 16.82586504 17.99104223]
* v_ann: [16.30004119873047, 16.157997131347656, 1
5.329912185668945, 17.10609187367722]

-----
- Time interval n.3: [257.04, 257.24]
* y_true: [10.66053629 16.53589178 24.03163218]
* v_ann: [16.209474563598633, 16.065650939941406, 1
5.276789665222168, 17.10609187367722]

-----
* err= 3.408112999915657
* Learning rate NN = 0.000239148415857926
* diff = 0.0006270719631706889

```



For scene 20/21

```

* use LR_NN=0.0005 with err=17.995880267371657 at it=19
* v0_scn_mean = 18.57781148412372

```

\* MAE = 3.3843075381759284

=====

=====

For df=8 with 21 scenes, time taken: 237.99

=====

-----

=====

\*\*\*\*\*

\*\*\*\*\*

In df n.9/10 we have 9 scenes

\*\*\*\*\*

\*\*\*\*\*

For scene 0/9

\* use LR\_NN=0.0005 with err=34.91090550111759 at it=19

\* v0\_scn\_mean = 29.176159823438702

\* MAE = 1.64746709652319

=====

=====

For scene 1/9

\* use LR\_NN=0.001 with err=15.998523453079024 at it=19

\* v0\_scn\_mean = 32.45999098978225

\* MAE = 0.15070864454834754

-----

- Time interval n.0: [37.80, 38.00]

\* y\_true: [21.35828745 27.25004814]

\* v\_ann: [22.80927848815918, 22.583797454833984, 2  
3.63909703244705]

-----

- Time interval n.1: [38.00, 38.20]

\* y\_true: [19.23626153 17.91519282]

\* v\_ann: [22.867258071899414, 22.58534049987793, 2  
3.63909703244705]

-----

- Time interval n.2: [38.20, 38.40]

\* y\_true: [24.96063116 28.62771944]

\* v\_ann: [22.777114868164062, 22.561203002929688, 2  
3.63909703244705]

-----

- Time interval n.3: [38.40, 38.60]

\* y\_true: [24.1844348 25.71934895]

\* v\_ann: [22.87847328186035, 22.612686157226562, 2  
3.63909703244705]

```

-----  

- Time interval n.4: [38.60, 38.80]  

* y_true: [26.26418379 21.80127307]  

* v_ann: [22.931957244873047, 22.61455535888672, 2  

3.63909703244705]
-----
```

```

-----  

- Time interval n.5: [38.80, 39.00]  

* y_true: [15.9216195 19.51476921]  

* v_ann: [22.935468673706055, 22.63011360168457, 2  

3.63909703244705]
-----
```

```

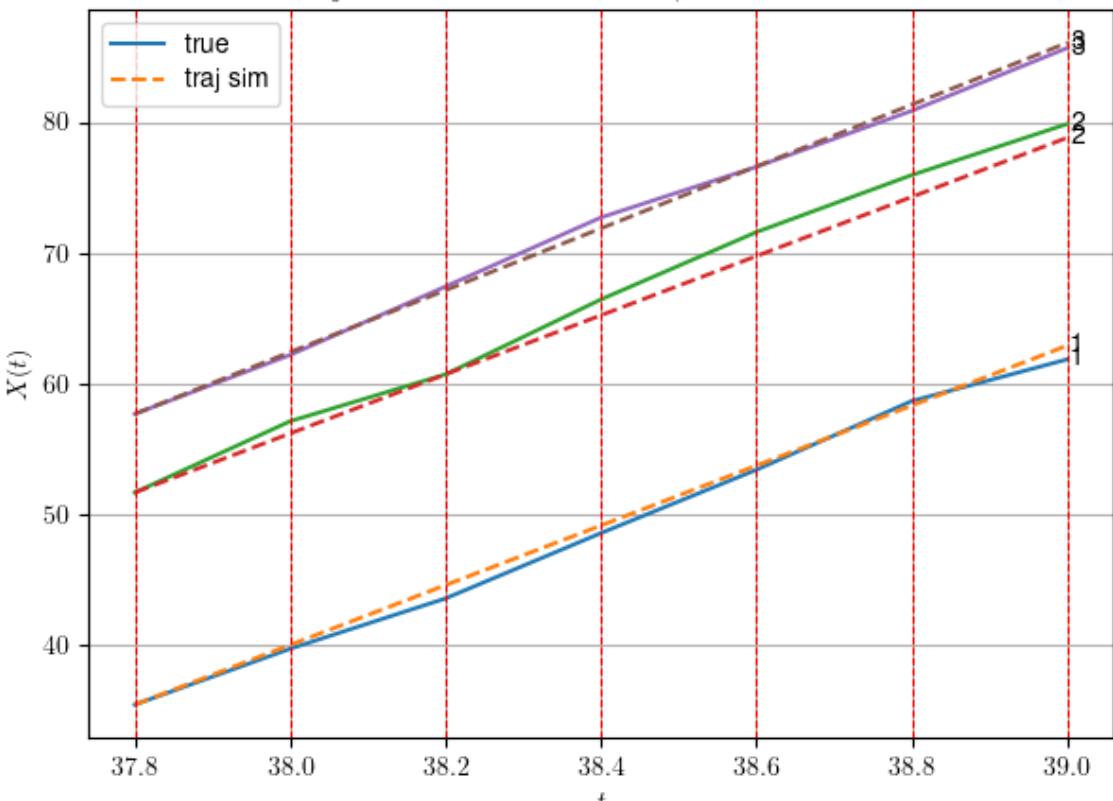
-----  

* err= 0.6470949850370601  

* Learning rate NN = 1.5690524378442205e-05  

-----
```

*df n. 9 – Scene n. 2, at it = 350*



For scene 2/9  
\* use LR\_NN=5e-05 with err=47.67538841446633 at it=19  
\* v0\_scn\_mean = 24.184271169635437  
\* MAE = 0.5446246961420051

```

=====  

-----  

- Time interval n.0: [44.40, 44.60]  

* y_true: [24.95803839 22.94664651]  

* v_ann: [25.866596221923828, 26.083477020263672, 1  

8.016193314109223]
-----
```

```

-----  

- Time interval n.1: [44.60, 44.80]  

* y_true: [22.38974011 30.85088397]  

* v_ann: [24.725759506225586, 24.315019607543945, 1  

8.016193314109223]
-----
```

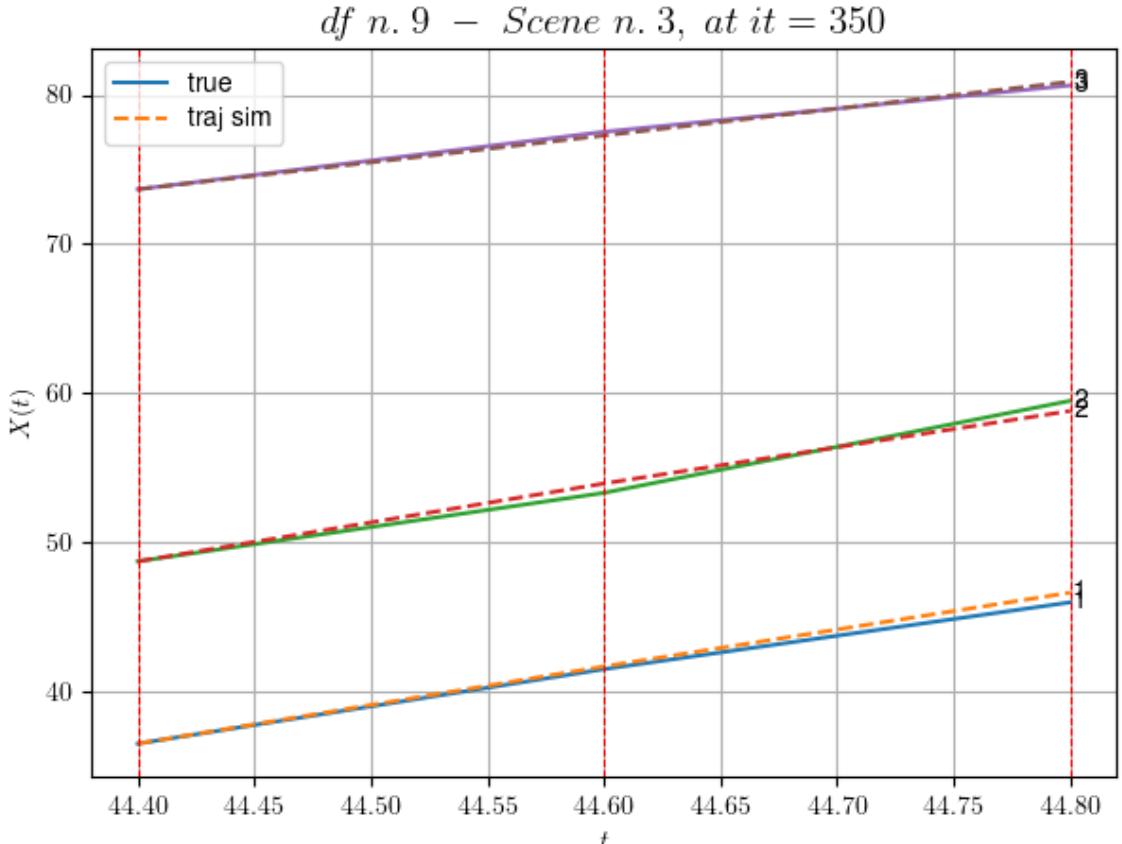
```

-----  

* err= 0.1591359486071062  

* Learning rate NN = 0.00036449998151510954  

* diff = 1 222677070010011000 0E
-----
```



For scene 3/9

```

* use LR_NN=0.0005 with err=5.696592801714421 at it=19
* v0_scn_mean = 19.043289860549024
* MAE = 0.158450034452764
=====
```

```

-----  

- Time interval n.0: [117.80, 118.00]  

* y_true: [26.21501314 26.51617559]  

* v_ann: [25.91661834716797, 25.664236068725586, 3  

2.947804333007745]
-----
```

```

-----  

- Time interval n.1: [118.00, 118.20]  

* y_true: [24.27291409 32.45579962]  

* v_ann: [25.94540786743164, 25.69896125793457, 32.  

947804333007745]
-----
```

```

-----  

- Time interval n.2: [118.20, 118.40]  

* y_true: [21.96072195 23.86482679]  

* v_ann: [26.06397819519043, 25.948488235473633, 3  

2.947804333007745]
-----
```

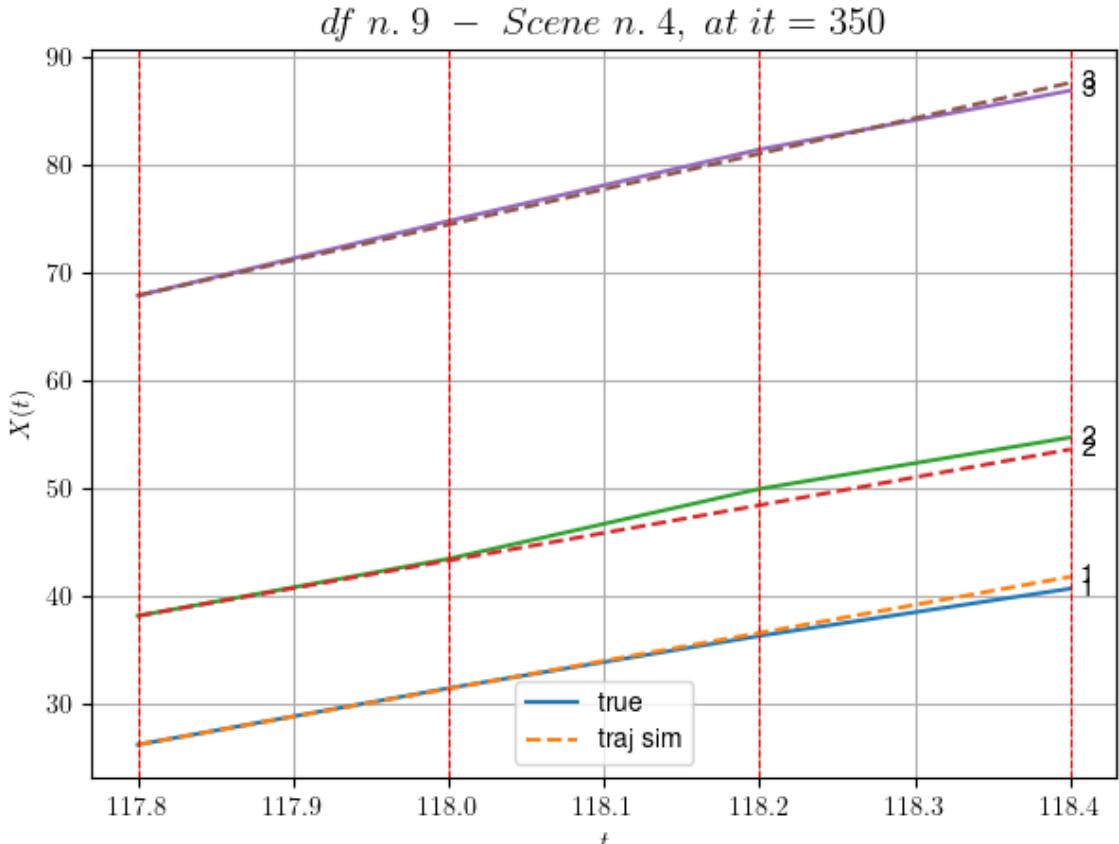
```

-----  

* err= 0.4706046501129498  

* Learning rate NN = 2.952449540316593e-05  

* diff = 0.00011202021121506285
-----
```



For scene 4/9

```

* use LR_NN=5e-05 with err=7.436587004939271 at it=19  

* v0_scn_mean = 32.69515676205062  

* MAE = 0.4391524786974819
=====
```

```

-----  

- Time interval n.0: [119.20, 119.40]  

* y_true: [23.20444186 22.52067771]  

* v_ann: [25.888498306274414, 25.534395217895508, 2  

6.734613425844117]
-----
```

```

-----  

- Time interval n.1: [119.40, 119.60]  

* y_true: [27.39348249 26.5570173 ]  

* v_ann: [24.107690811157227, 24.006906509399414, 2  

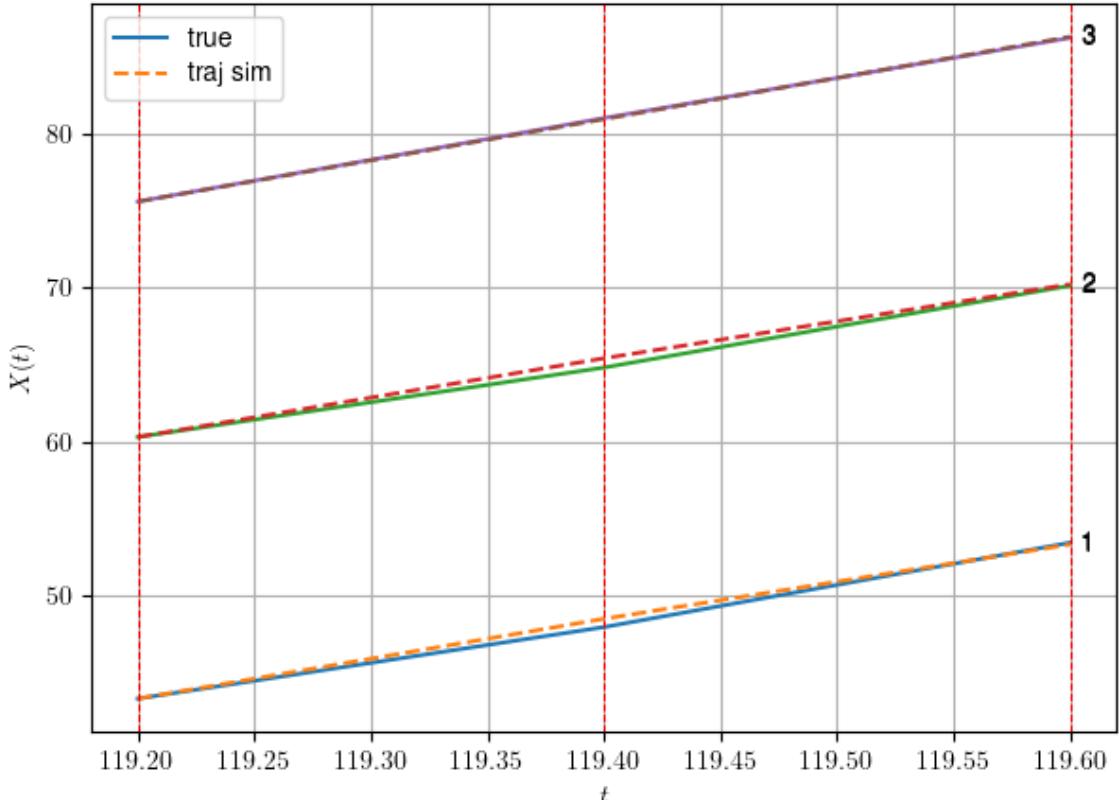
6.734613425844117]
-----
```

```

* err= 0.07614989254111752
* Learning rate NN = 0.00036449998151510954
* diff = 3.092769189584621e-05

```

*df n. 9 – Scene n. 5, at it = 350*



For scene 5/9

```

* use LR_NN=0.0005 with err=0.342848507417477 at it=19
* v0_scn_mean = 27.014480029254482
* MAE = 0.07614989254111752

```

---



---

- Time interval n.0: [120.20, 120.40]  
\* y\_true: [30.48045094 26.16776015]  
\* v\_ann: [26.406023025512695, 27.17797088623047, 2  
7.349006463343958]

---



---

- Time interval n.1: [120.40, 120.60]  
\* y\_true: [26.23623075 25.12734403]  
\* v\_ann: [26.655054092407227, 27.58773422241211, 2  
7.349006463343958]

---

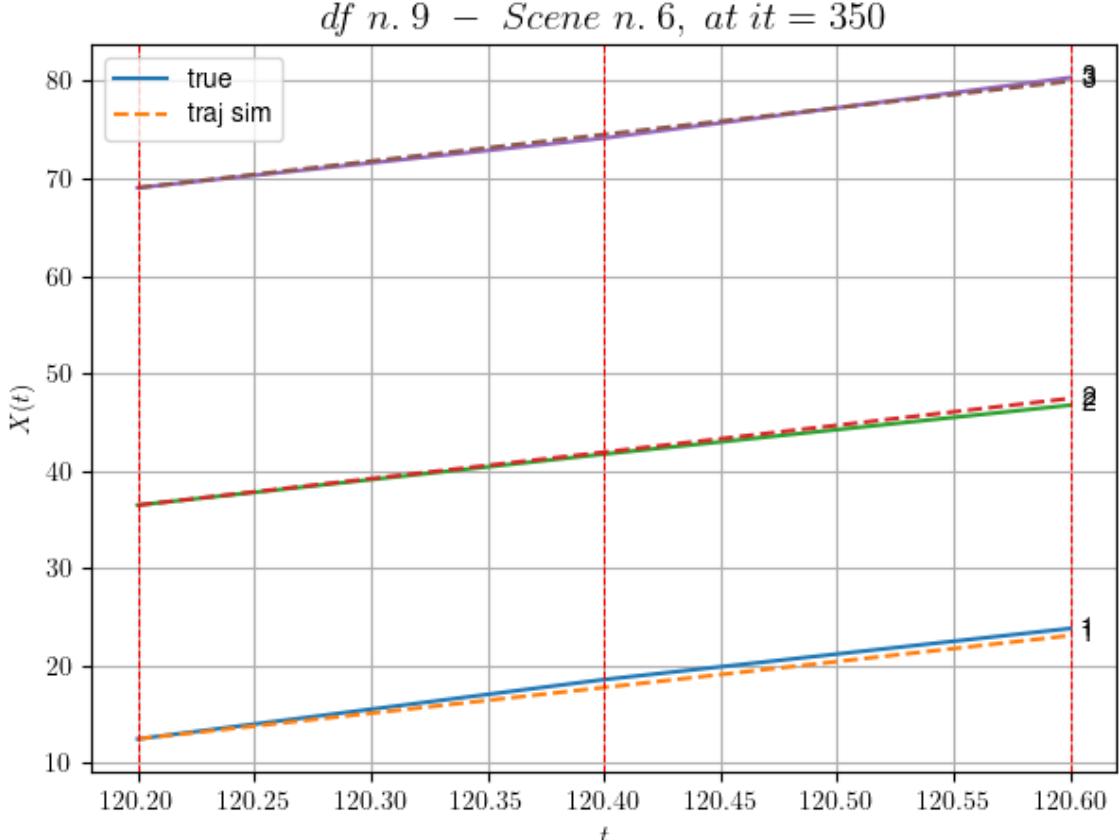


---

```

* err= 0.22248618291968414
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0009406618480489459

```



For scene 6/9

- \* use LR\_NN=0.0001 with err=1.6705031935597932 at it=19
- \* v0\_scn\_mean = 27.5762152608073
- \* MAE = 0.22248618291968414

---



---

For scene 7/9

- \* use LR\_NN=0.0005 with err=18.338963755779496 at it=19
- \* v0\_scn\_mean = 28.801353771637697
- \* MAE = 0.24373741012195027

---



---

- Time interval n.0: [205.80, 206.00]
- \* y\_true: [16.81767795 9.52209489]
- \* v\_ann: [11.732536315917969, 12.700749397277832, 2  
3.158700610445106]

---



---

- Time interval n.1: [206.00, 206.20]
- \* y\_true: [13.65726133 9.1692133 ]
- \* v\_ann: [12.500988006591797, 12.22205924987793, 2  
3.158700610445106]

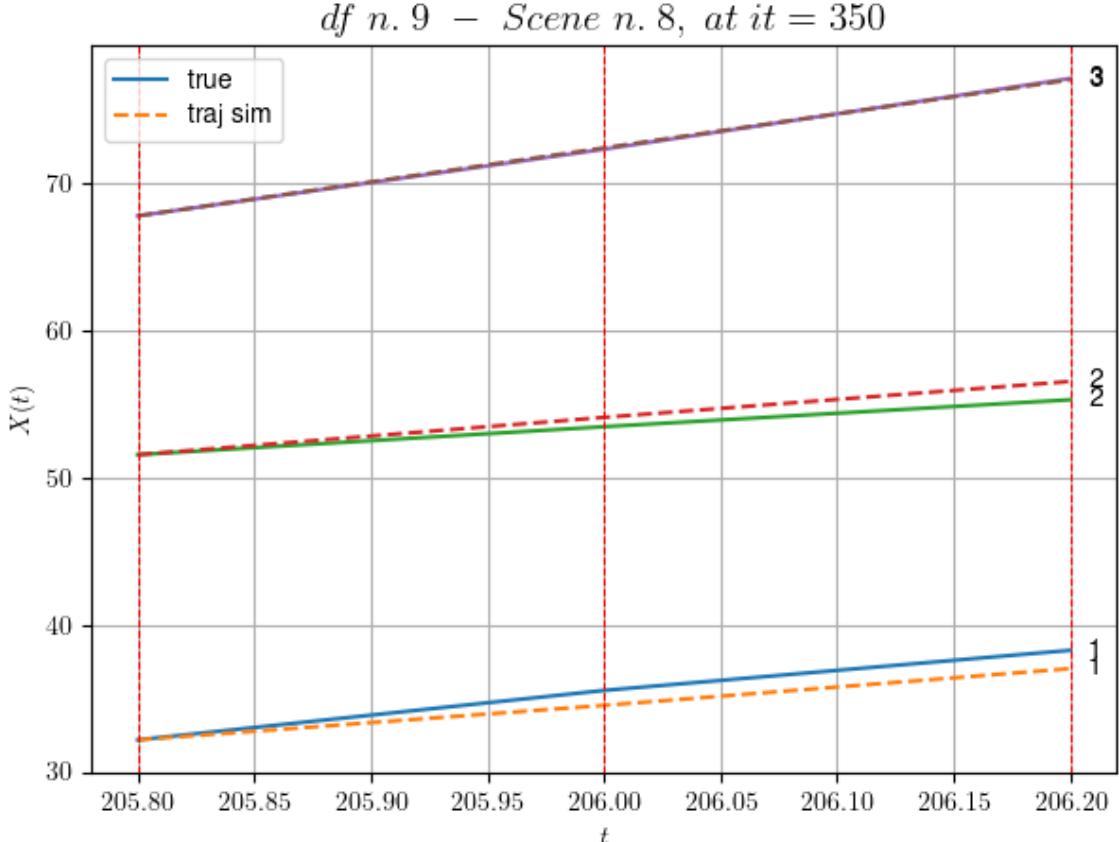
---



---

\* err= 0.5074992229076684

\* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.00038421047491787874



For scene 8/9

\* use LR\_NN=0.0005 with err=1.3320214701448112 at it=19  
 \* v0\_scn\_mean = 23.745048100883743  
 \* MAE = 0.5074992229076684

For df=9 with 9 scenes, time taken: 77.56

In df n.10/10 we have 22 scenes

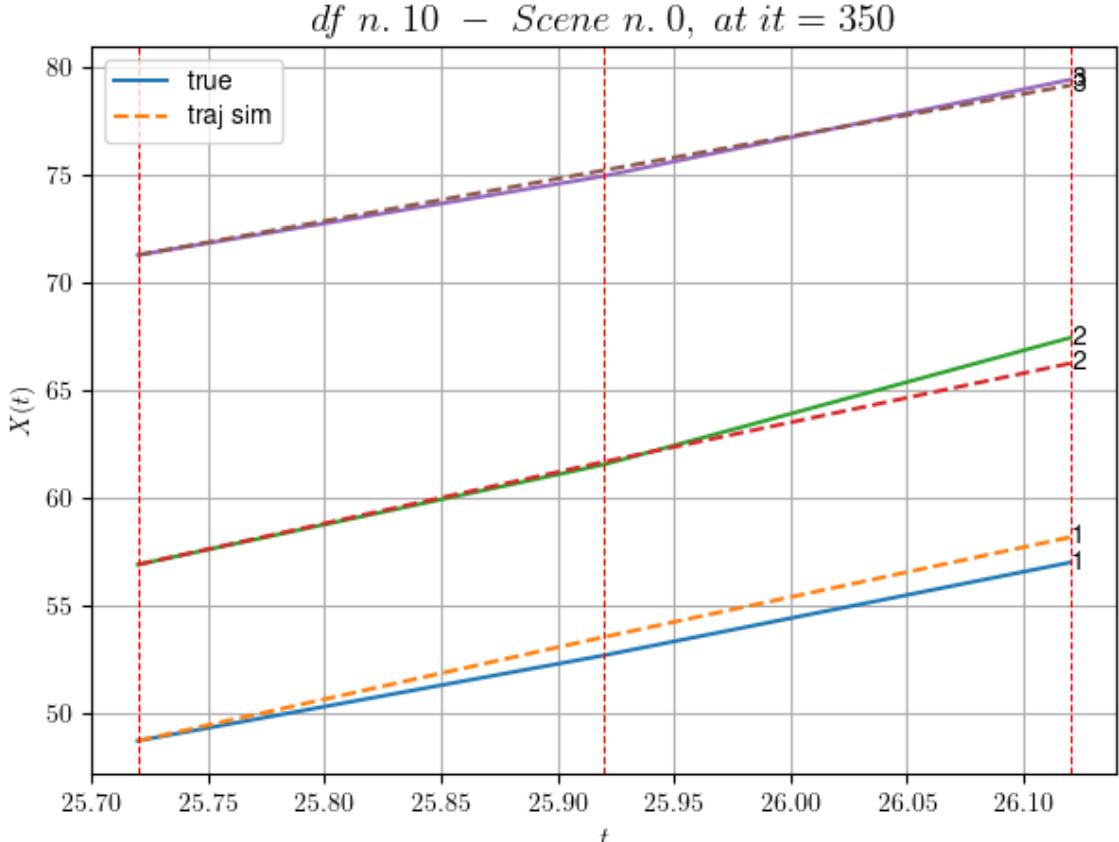
- Time interval n.0: [25.72, 25.92]  
 \* y\_true: [19.85100065 23.2716 ]  
 \* v\_ ann: [24.125423431396484, 23.902973175048828, 1  
 9.70885794583033]

- Time interval n.1: [25.92, 26.12]  
 \* y\_true: [21.59125574 29.46240542]  
 \* v\_ ann: [23.187803268432617, 22.88347816467285, 1  
 9.70885794583033]

```

* err= 0.4095069962061125
* Learning rate NN = 0.00036449998151510954
* diff = 0.00017676992502646538

```



For scene 0/22

```

* use LR_NN=0.0005 with err=2.789562783606366 at it=19
* v0_scn_mean = 20.590881224393662
* MAE = 0.4095069962061125

```

```

- Time interval n.0: [71.72, 71.92]
  * y_true: [25.44045996 0.68637625]
  * v_ann: [16.617507934570312, 17.889549255371094, 2
4.696218424736657]

```

```

- Time interval n.1: [71.92, 72.12]
  * y_true: [ 7.65710886 16.8398502 ]
  * v_ann: [13.759509086608887, 19.750757217407227, 2
4.696218424736657]

```

```

- Time interval n.2: [72.12, 72.32]
  * y_true: [ 0.68637625 22.9307169 ]
  * v_ann: [13.946966171264648, 19.0402774810791, 24.
696218424736657]

```

```

-----  

    - Time interval n.3: [72.32, 72.52]  

      * y_true: [ 6.45821063 27.07107802]  

      * v_ann: [15.070089340209961, 17.96976661682129, 2  

4.696218424736657]  

-----  

    - Time interval n.4: [72.52, 72.72]  

      * y_true: [23.5506867 30.63154479]  

      * v_ann: [16.74869728088379, 18.247865676879883, 2  

4.696218424736657]  

-----  

    - Time interval n.5: [72.72, 72.92]  

      * y_true: [30.10113572 22.57136168]  

      * v_ann: [19.287431716918945, 19.24832534790039, 2  

4.696218424736657]  

-----  

    - Time interval n.6: [72.92, 73.12]  

      * y_true: [11.75053045 22.24158734]  

      * v_ann: [20.017536163330078, 21.970977783203125, 2  

4.696218424736657]  

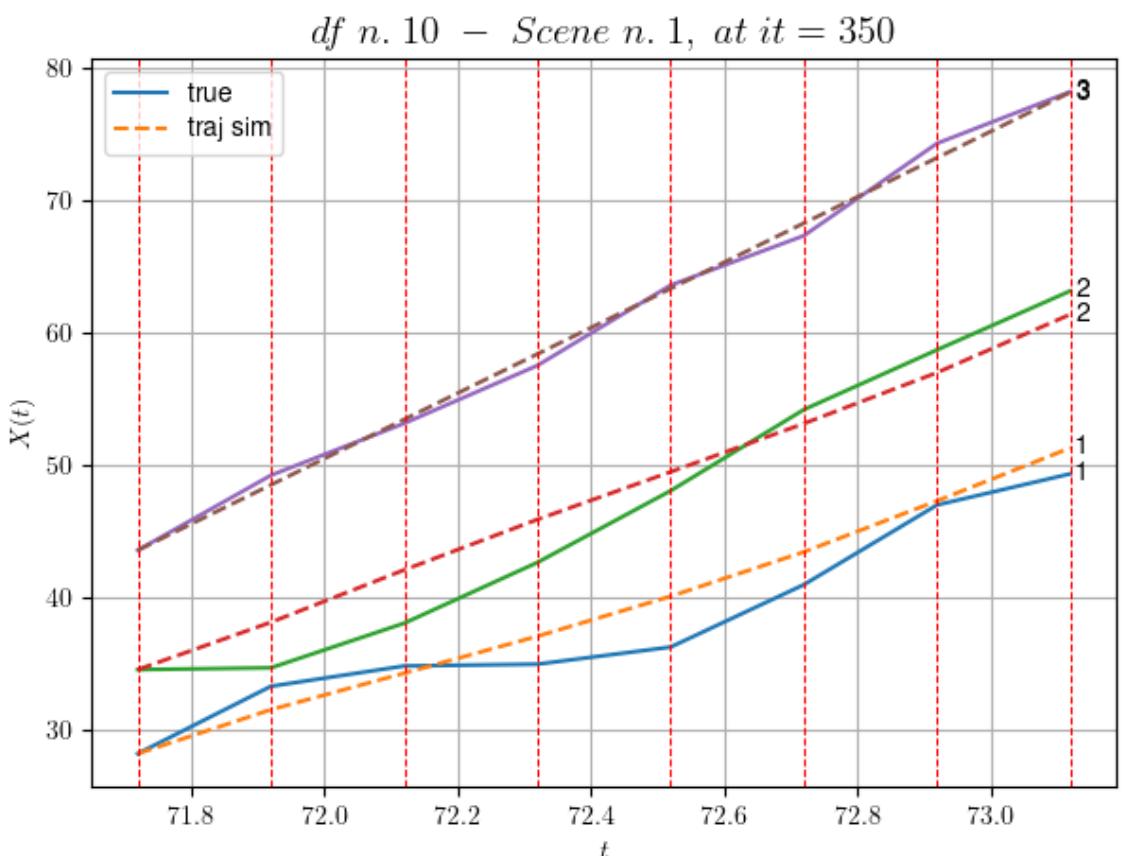
-----  

      * err= 3.493133556802754  

      * Learning rate NN = 0.00012709324073512107  

      * diff = 0.018062646761984436

```



For scene 1/22

\* use LR\_NN=0.0005 with err=13.20850918527656 at it=19

\* v0\_scn\_mean = 25.150789821105842

\* MAE = 3.493133556802754

- Time interval n.0: [120.92, 121.12]

\* y\_true: [2.40007998 4.01291198]

\* v\_ann: [7.435296535491943, 7.235768795013428, 19.875509421847788]

- Time interval n.1: [121.12, 121.32]

\* y\_true: [3.94779745 3.96114827]

\* v\_ann: [7.137988567352295, 7.473182201385498, 19.875509421847788]

- Time interval n.2: [121.32, 121.52]

\* y\_true: [24.74097787 3.92663913]

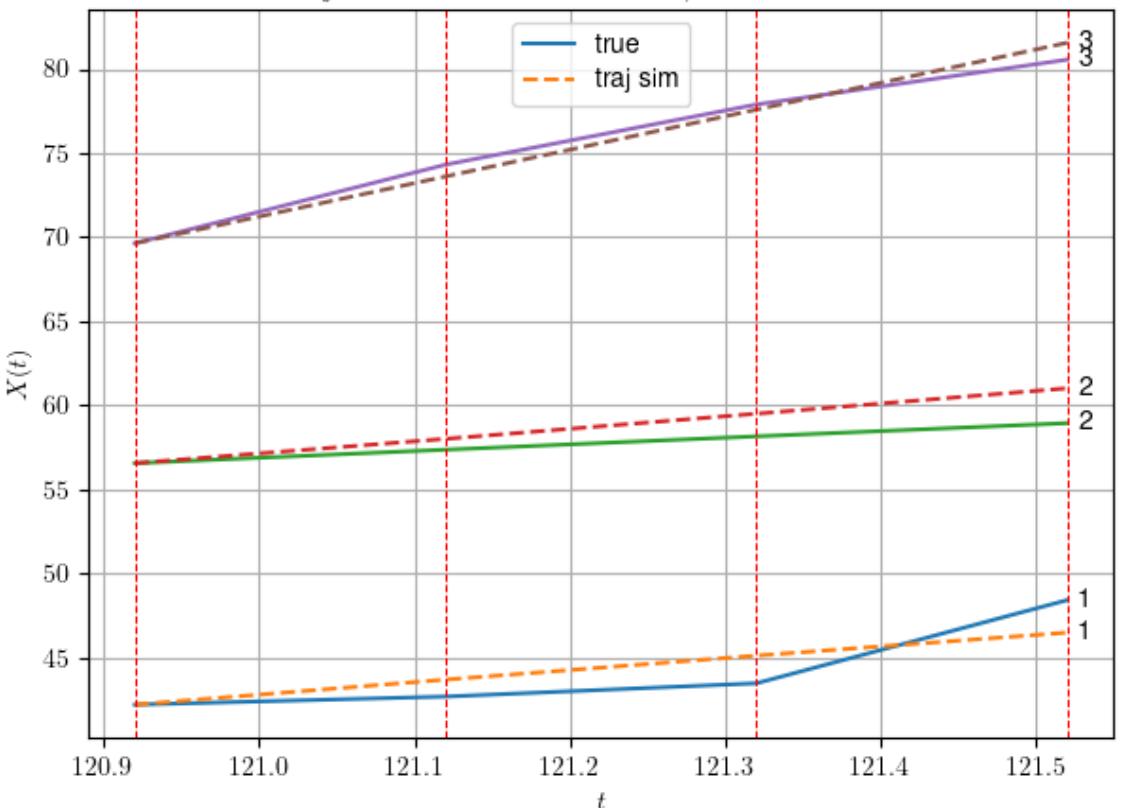
\* v\_ann: [6.844151973724365, 7.55855131149292, 19.875509421847788]

\* err= 1.298960757503188

\* Learning rate NN = 5.904899080633186e-05

\* diff = 0.00013622246739153354

*df n. 10 – Scene n. 2, at it = 350*



For scene 2/22

- \* use LR\_NN=0.0001 with err=6.528281538063254 at it=19
- \* v0\_scn\_mean = 20.743249496420685
- \* MAE = 1.2937923855337015

---



---

- Time interval n.0: [122.12, 122.32]
- \* y\_true: [20.84138029 3.6661027 ]
- \* v\_ann: [9.958492279052734, 10.247319221496582, 2  
7.527697849634308]

---

- Time interval n.1: [122.32, 122.52]
- \* y\_true: [11.80149783 9.92593948]
- \* v\_ann: [11.284887313842773, 10.345389366149902, 2  
7.527697849634308]

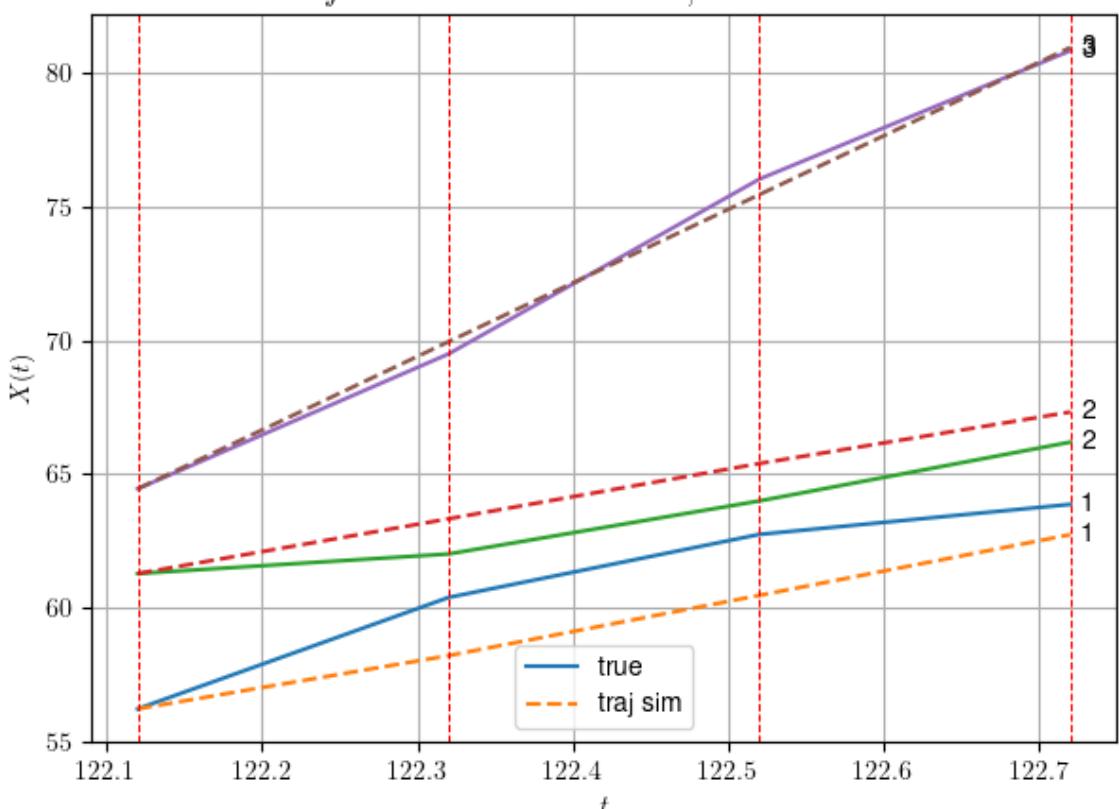
---

- Time interval n.2: [122.52, 122.72]
- \* y\_true: [ 5.61571017 11.00089954]
- \* v\_ann: [11.356419563293457, 9.632266998291016, 2  
7.527697849634308]

---

- \* err= 1.3948719137226988
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.0002481409391106304

*df n. 10 – Scene n. 3, at it = 350*



For scene 3/22

- \* use LR\_NN=0.001 with err=5.278312635049271 at it=19
- \* v0\_scn\_mean = 27.739591538088593
- \* MAE = 1.3899511513545066

---



---

- Time interval n.0: [194.52, 194.72]
- \* y\_true: [18.69097642 14.73135237]

- \* v\_ann: [20.10326385498047, 20.225648880004883, 1  
5.385152268185989]

---



---

- Time interval n.1: [194.72, 194.92]
- \* y\_true: [17.84107996 20.91213867]

- \* v\_ann: [18.992151260375977, 19.391948699951172, 1  
5.385152268185989]

---



---

- Time interval n.2: [194.92, 195.12]
- \* y\_true: [20.95142105 24.20273885]

- \* v\_ann: [19.039522171020508, 19.47511100769043, 1  
5.385152268185989]

---



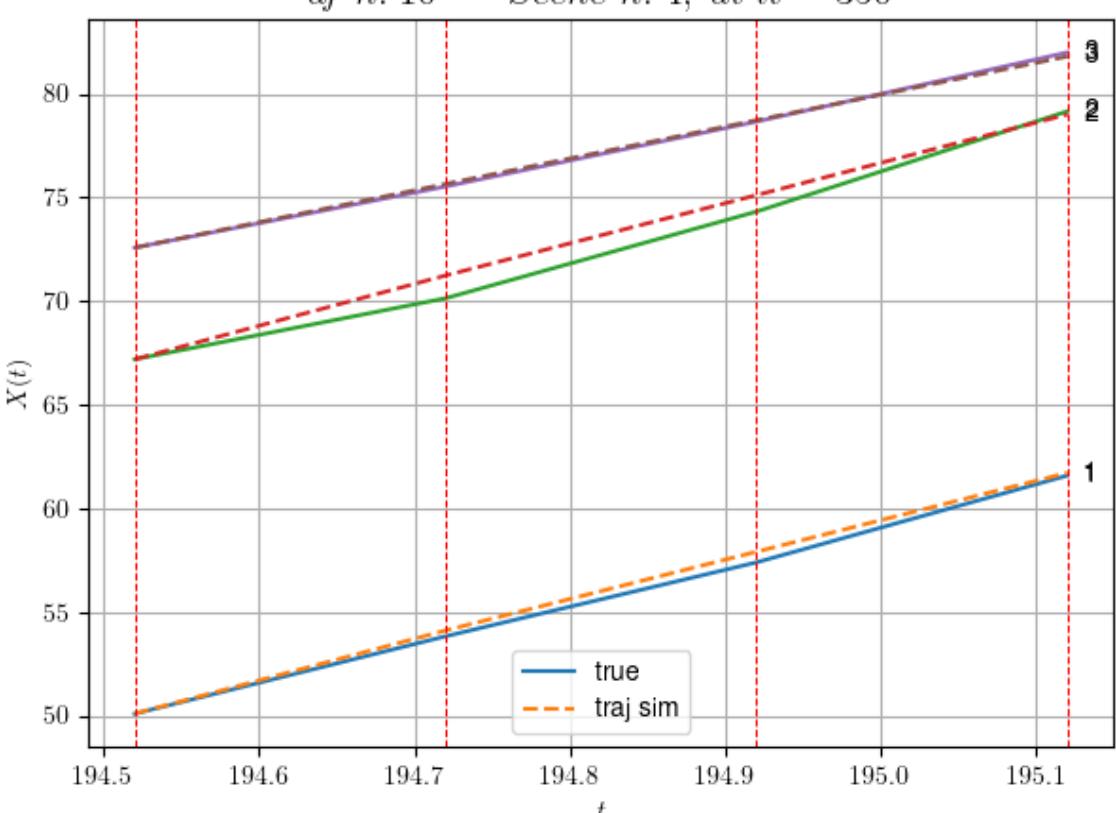
---

- \* err= 0.18996142134597924

- \* Learning rate NN = 0.0002952449722215533

- \* diff = 8.85959355950705e-06

*df n. 10 – Scene n. 4, at it = 350*



For scene 4/22

\* use LR\_NN=0.0005 with err=16.647475500752247 at it=19  
\* v0\_scn\_mean = 16.63774754325502  
\* MAE = 0.18661932811074658

=====

=====

- Time interval n.0: [201.52, 201.72]
  - \* y\_true: [45.67726396 25.9301702 ]
  - \* v\_ann: [29.245580673217773, 29.46814727783203, 25.79745372458011]
- Time interval n.1: [201.72, 201.92]
  - \* y\_true: [22.15536429 29.26032799]
  - \* v\_ann: [30.15479850769043, 31.4931583404541, 25.79745372458011]
- Time interval n.2: [201.92, 202.12]
  - \* y\_true: [30.43022185 23.25036083]
  - \* v\_ann: [29.42189598083496, 29.901029586791992, 25.79745372458011]
- Time interval n.3: [202.12, 202.32]
  - \* y\_true: [33.22042439 22.87050849]
  - \* v\_ann: [28.960548400878906, 29.046146392822266, 25.79745372458011]
- Time interval n.4: [202.32, 202.52]
  - \* y\_true: [33.45065979 24.47068757]
  - \* v\_ann: [28.83088493347168, 28.76580238342285, 25.79745372458011]
- Time interval n.5: [202.52, 202.72]
  - \* y\_true: [28.37081651 28.03104175]
  - \* v\_ann: [28.854726791381836, 28.8109130859375, 25.79745372458011]
- Time interval n.6: [202.72, 202.92]
  - \* y\_true: [33.85129081 29.41136895]
  - \* v\_ann: [28.78929901123047, 28.64248275756836, 25.79745372458011]
- Time interval n.7: [202.92, 203.12]

```

* y_true: [32.65166271 26.3315156 ]
* v_ann: [29.080224990844727, 29.417753219604492, 2
5.79745372458011]

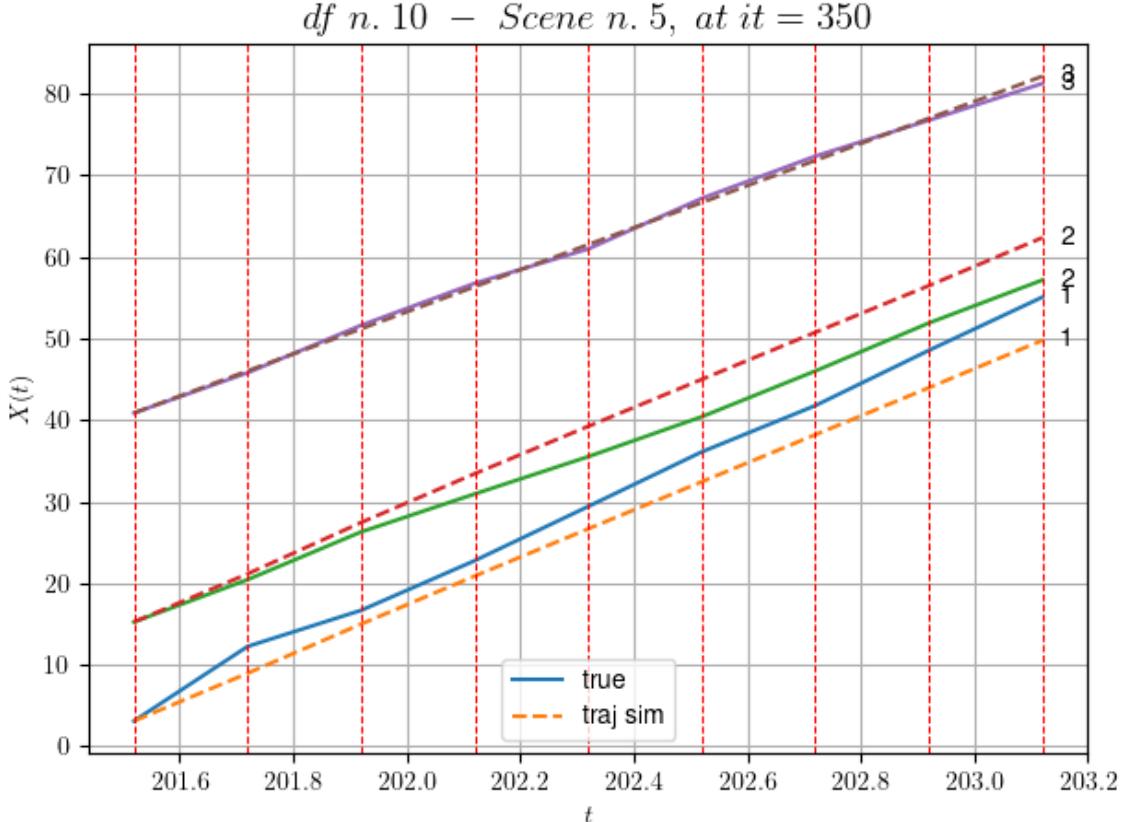
```

---

```

* err= 7.968419047590182
* Learning rate NN = 0.00010294552339473739
* diff = 0.0034781372561703855

```



For scene 5/22

```

* use LR_NN=0.0005 with err=153.8976147099776 at it=19
* v0_scn_mean = 26.15764150788415
* MAE = 7.968419047590182

```

---



---

```

- Time interval n.0: [210.12, 210.32]
  * y_true: [23.65050773 21.02104774]
  * v_ann: [23.74071502685547, 24.045509338378906, 2
4.382940011426964]

```

---

```

- Time interval n.1: [210.32, 210.52]
  * y_true: [27.53081175 21.02121012]
  * v_ann: [22.616804122924805, 22.70525360107422, 2
4.382940011426964]

```

---

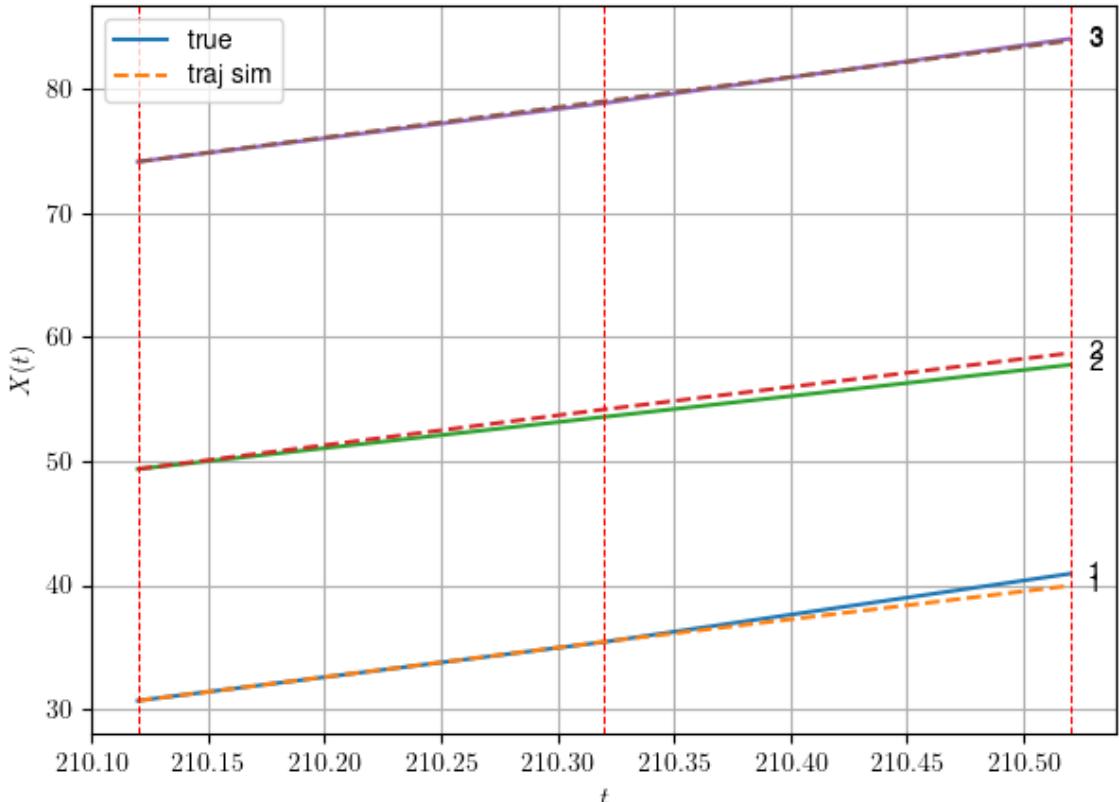
```

* err= 0.24862242510003174
* Learning rate NN = 0.00036449998151510954

```

\* diff = 0.00012790737181714307

df n. 10 – Scene n. 6, at it = 350



For scene 6/22

\* use LR\_NN=0.0005 with err=1.982690719953644 at it=19  
 \* v0\_scn\_mean = 24.864361571923407  
 \* MAE = 0.24094988431636186

---



---

- Time interval n.0: [236.52, 236.72]  
 \* y\_true: [22.75077388 14.36119092]  
 \* v\_ann: [22.988784790039062, 22.25442886352539, 2  
 4.944297288056724]

---

- Time interval n.1: [236.72, 236.92]  
 \* y\_true: [21.51093715 22.77208028]  
 \* v\_ann: [20.977134704589844, 21.157594680786133, 2  
 4.944297288056724]

---

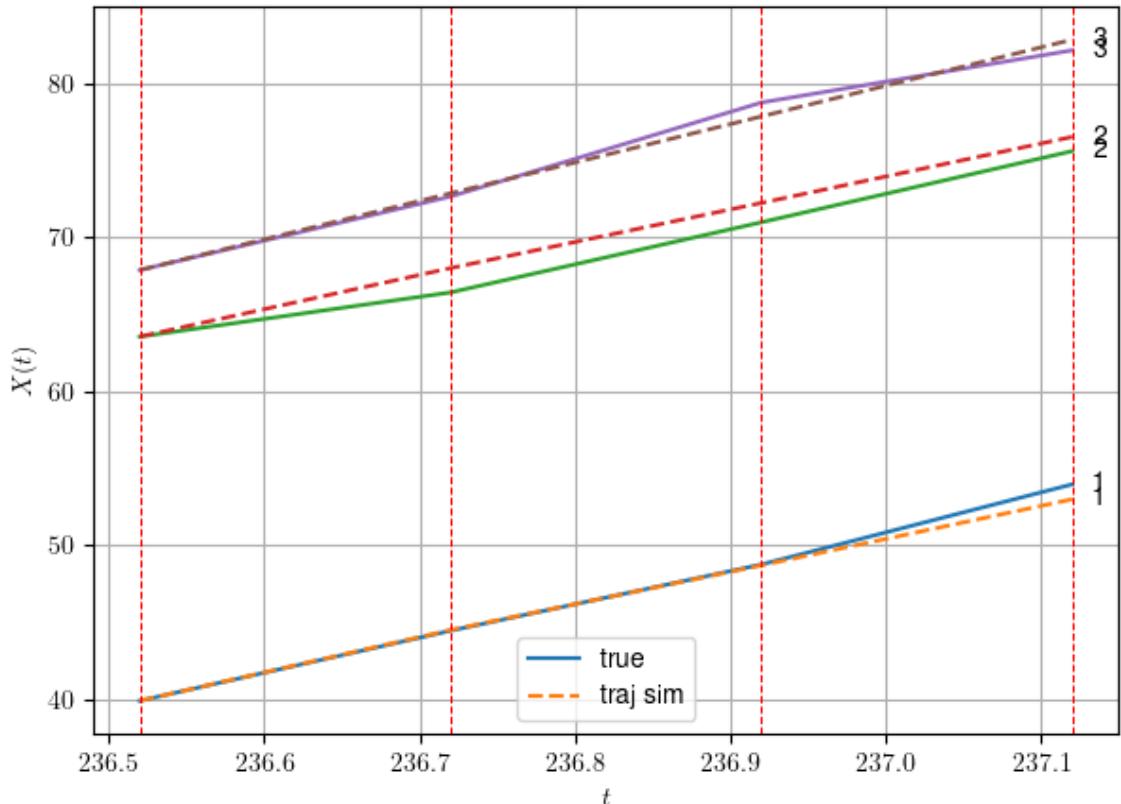
- Time interval n.2: [236.92, 237.12]  
 \* y\_true: [26.0213192 23.10241688]  
 \* v\_ann: [21.463455200195312, 21.454092025756836, 2  
 4.944297288056724]

---

\* err= 0.6014502359067834  
 \* Learning rate NN = 0.0002952449722215533

\* diff = 1.29528444244853e-05

df n. 10 – Scene n. 7, at it = 350



For scene 7/22

\* use LR\_NN=0.0005 with err=9.034098144247135 at it=19  
 \* v0\_scn\_mean = 25.377606580451932  
 \* MAE = 0.6009963913232627

---



---

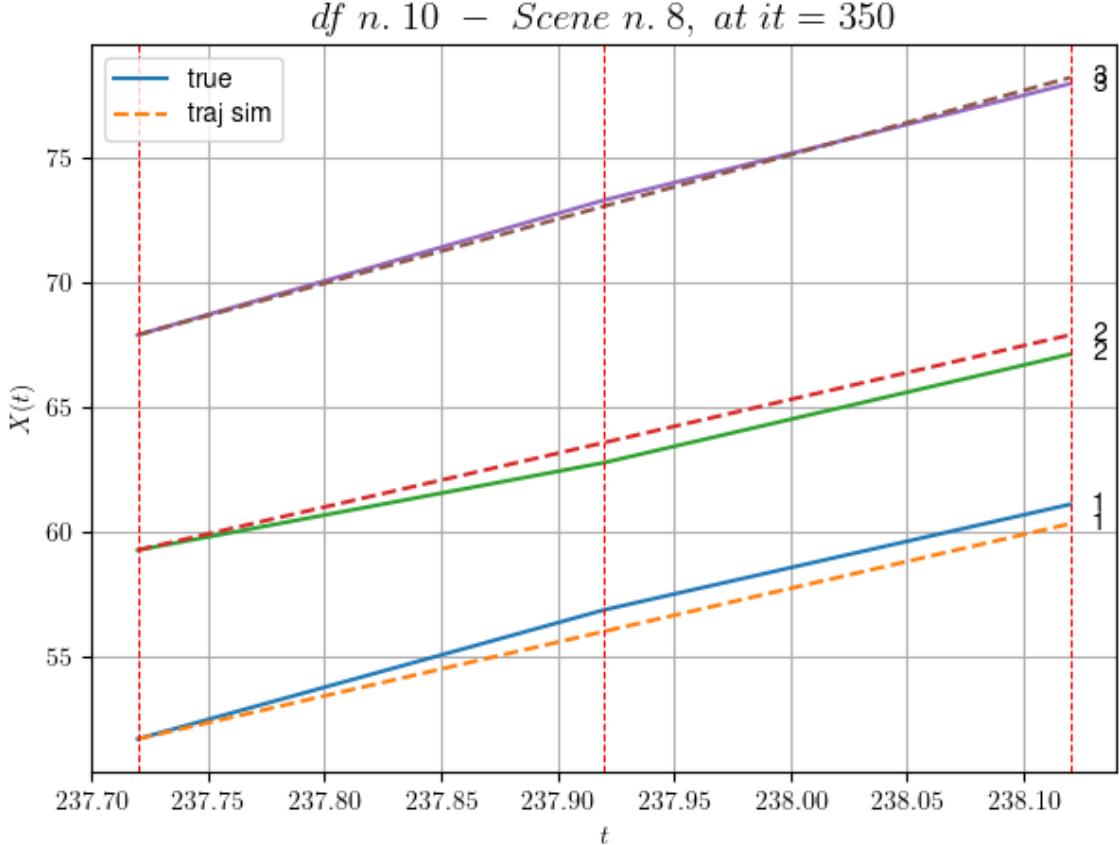
- Time interval n.0: [237.72, 237.92]  
 \* y\_true: [25.90146221 17.55123599]  
 \* v\_ann: [21.580984115600586, 21.57988739013672, 2  
 5.832622552460432]

---

- Time interval n.1: [237.92, 238.12]  
 \* y\_true: [21.20141323 21.76181979]  
 \* v\_ann: [21.62672996520996, 21.627269744873047, 2  
 5.832622552460432]

---

\* err= 0.3031543443707149  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 3.175180413877987e-05



For scene 8/22

- \* use LR\_NN=0.0005 with err=1.830149792429293 at it=19
- \* v0\_scn\_mean = 26.189796119780986
- \* MAE = 0.3031543443707149

---



---

- Time interval n.0: [317.32, 317.52]
  - \* y\_true: [14.46061508 5.00523108]
  - \* v\_ann: [9.569231986999512, 9.327963829040527, 5.959565079937888]
- Time interval n.1: [317.52, 317.72]
  - \* y\_true: [10.48047894 8.66542797]
  - \* v\_ann: [9.8140287399292, 9.637215614318848, 5.959565079937888]
- Time interval n.2: [317.72, 317.92]
  - \* y\_true: [ 5.95030099 13.38070893]
  - \* v\_ann: [9.694769859313965, 9.510478019714355, 5.959565079937888]
- Time interval n.3: [317.92, 318.12]
  - \* y\_true: [ 6.50033899 15.86094106]
  - \* v\_ann: [9.736429214477539, 9.606138229370117, 5.959565079937888]

59565079937888]

---

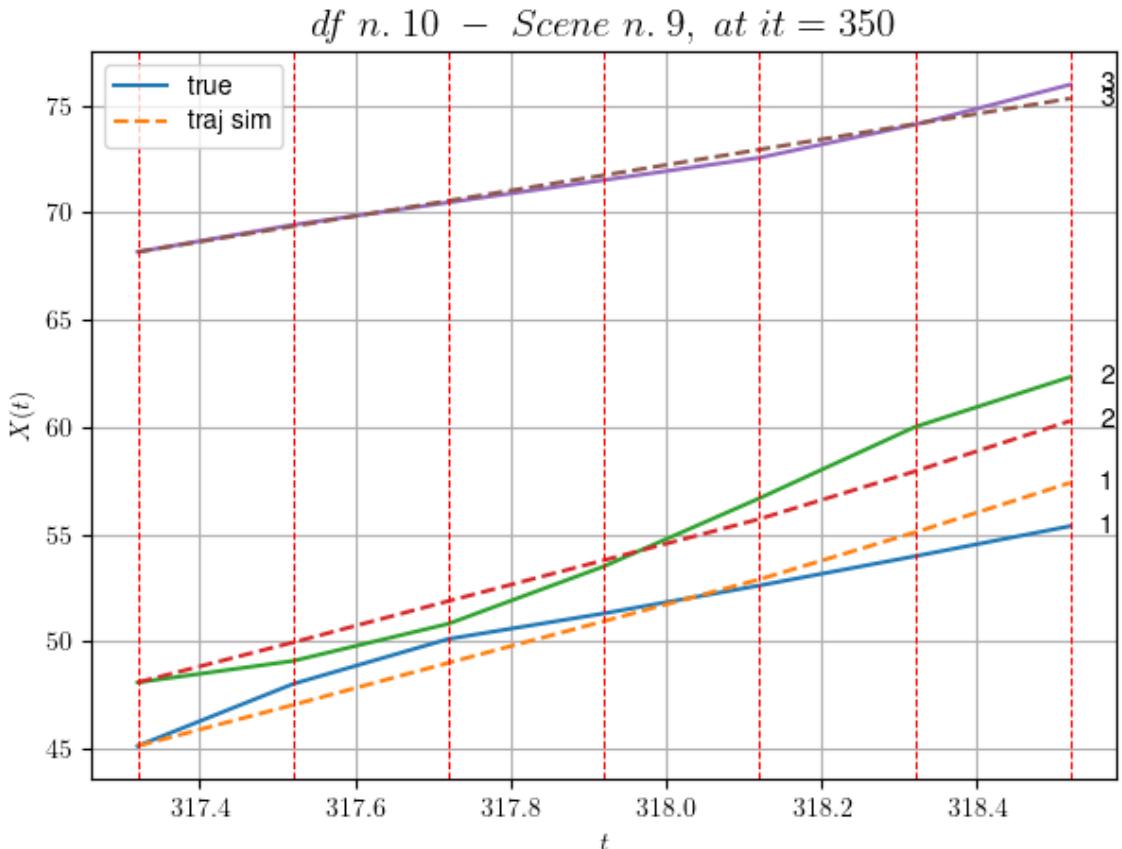
- Time interval n.4: [318.12, 318.32]
  - \* y\_true: [ 6.81537877 16.61109559]
  - \* v\_ann: [10.950654983520508, 11.096521377563477, 5.959565079937888]

---

- Time interval n.5: [318.32, 318.52]
  - \* y\_true: [ 7.02540529 11.65083477]
  - \* v\_ann: [11.574981689453125, 11.762804985046387, 5.959565079937888]

---

- \* err= 0.9384108407943601
- \* Learning rate NN = 0.0015690524596720934
- \* diff = 4.107548414766793e-05



For scene 9/22

- \* use LR\_NN=0.005 with err=102.02623822998646 at it=19
- \* v0\_scn\_mean = 8.019999491849417
- \* MAE = 0.9384108407943601

---



---

- Time interval n.0: [321.12, 321.32]
  - \* y\_true: [25.50087189 14.95118626]
  - \* v\_ann: [19.402942657470703, 17.85501480102539, 2]

5.328462391543354]

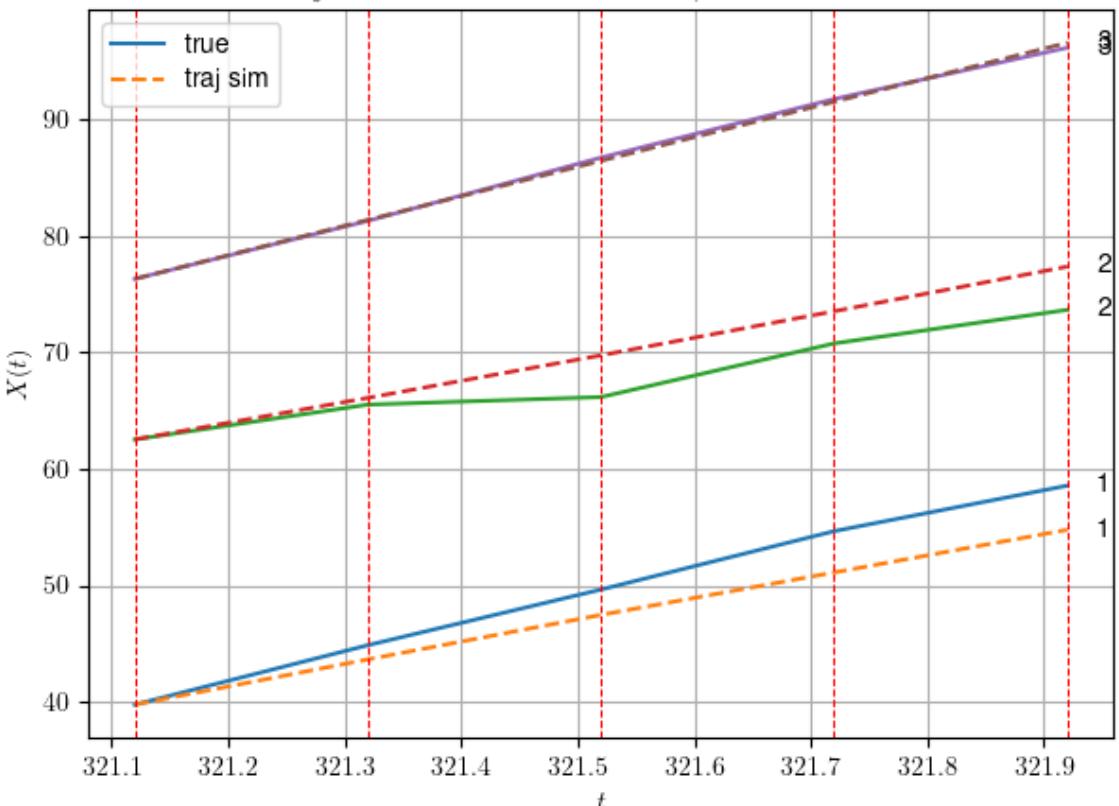
```
- Time interval n.1: [321.32, 321.52]
  * y_true: [23.87107171 3.25027229]
  * v_ann: [19.09100341796875, 18.243328094482422, 2
5.328462391543354]
```

```
- Time interval n.2: [321.52, 321.72]
  * y_true: [25.04128771 23.00208642]
  * v_ann: [18.215356826782227, 18.895753860473633, 2
5.328462391543354]
```

```
- Time interval n.3: [321.72, 321.92]
  * y_true: [19.5212431 14.40145141]
  * v_ann: [18.312889099121094, 19.160030364990234, 2
5.328462391543354]
```

```
* err= 4.527310470858607
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.0019456476972354864
```

*df n. 10 – Scene n. 10, at it = 350*



For scene 10/22

```
* use LR_NN=5e-05 with err=4.594079451753049 at it=19
* v0_scn_mean = 25.728846031731475
* MAE = 4.455038294724569
```

```
=====
=====

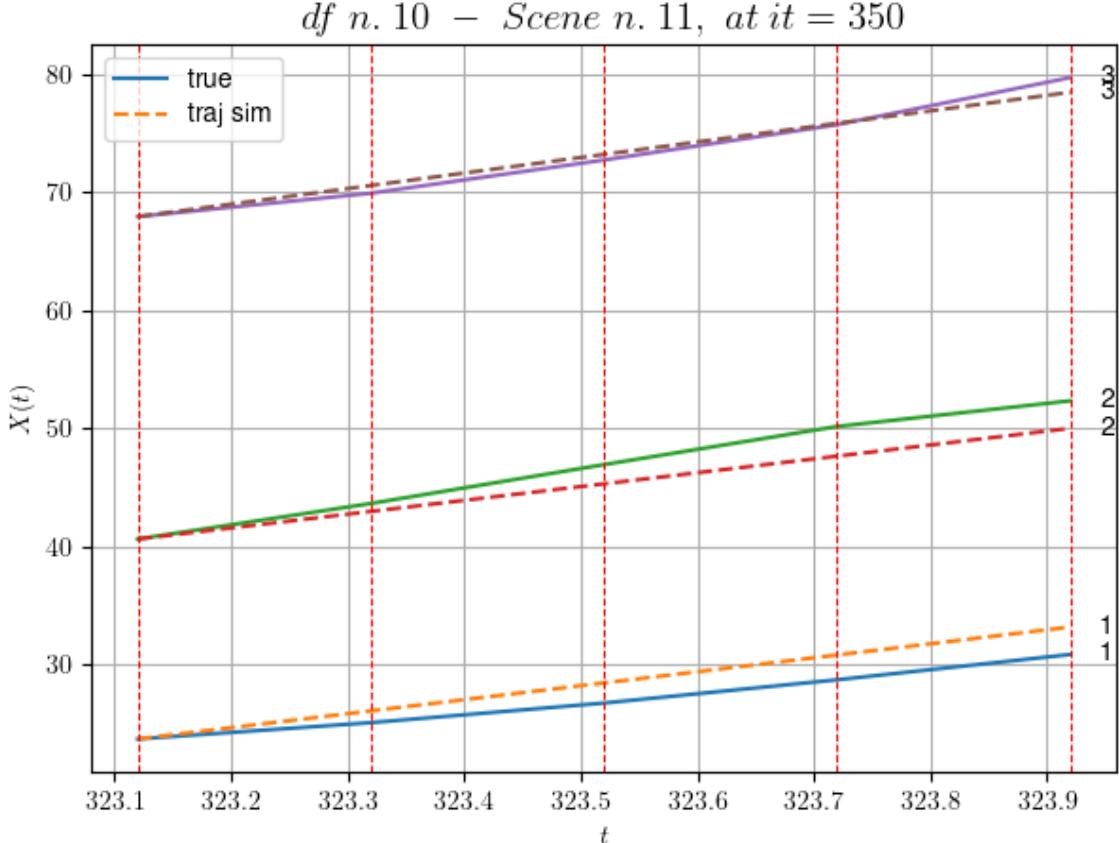
    - Time interval n.0: [323.12, 323.32]
      * y_true: [ 6.90008114 15.05052158]
      * v_ann: [11.893677711486816, 11.69863224029541, 1
3.161438821255102]

-----
    - Time interval n.1: [323.32, 323.52]
      * y_true: [ 8.30010994 16.45065772]
      * v_ann: [11.825864791870117, 11.673136711120605, 1
3.161438821255102]

-----
    - Time interval n.2: [323.52, 323.72]
      * y_true: [ 9.85014911 16.15074097]
      * v_ann: [11.824070930480957, 11.71770191192627, 1
3.161438821255102]

-----
    - Time interval n.3: [323.72, 323.92]
      * y_true: [10.7001865 10.85055419]
      * v_ann: [11.8626127243042, 11.791389465332031, 13.
161438821255102]

-----
* err= 2.050228940100809
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.0008603237435602651
```



For scene 11/22

- \* use LR\_NN=0.0001 with err=21.79801230938669 at it=19
- \* v0\_scn\_mean = 14.60462198391961
- \* MAE = 2.050228940100809

---



---

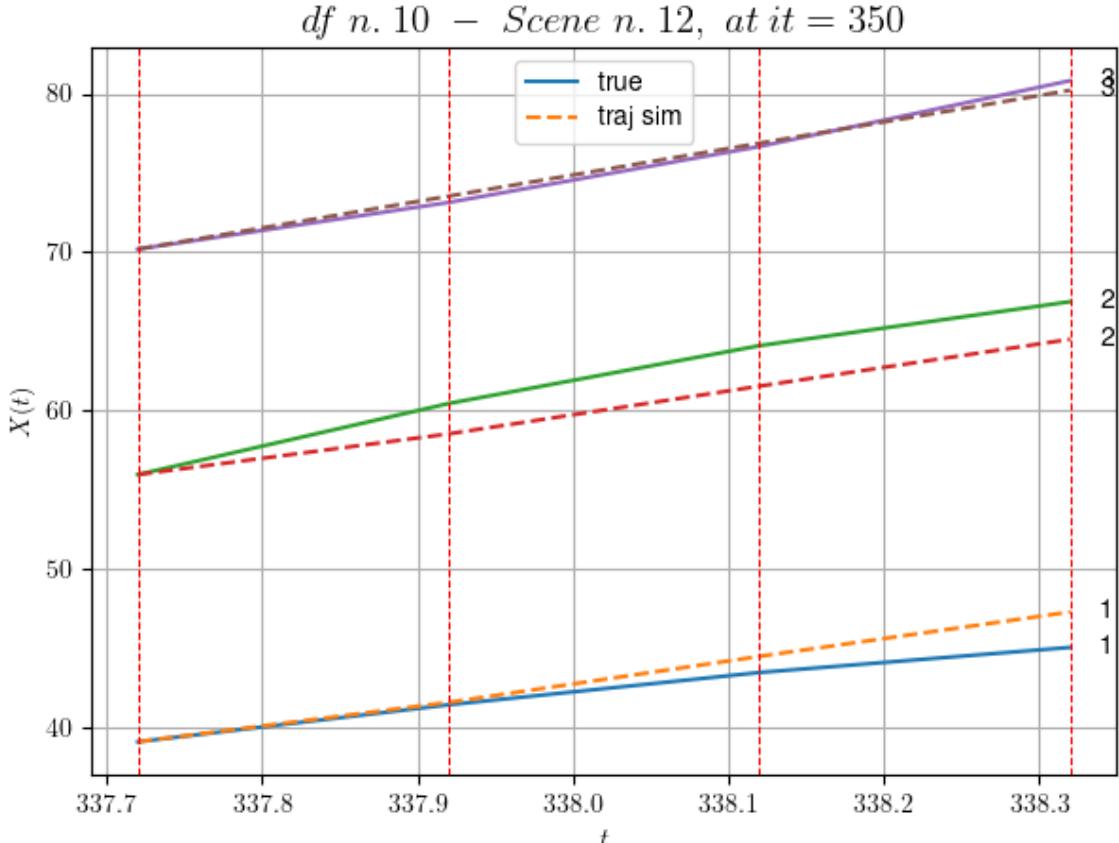
- Time interval n.0: [337.72, 337.92]
  - \* y\_true: [11.69035174 22.47147634]
  - \* v\_ann: [12.46230697631836, 12.875212669372559, 1  
6.738540275581308]
- Time interval n.1: [337.92, 338.12]
  - \* y\_true: [10.20034007 18.27135214]
  - \* v\_ann: [14.53343677520752, 15.083122253417969, 1  
6.738540275581308]
- Time interval n.2: [338.12, 338.32]
  - \* y\_true: [ 7.94029275 13.91116184]
  - \* v\_ann: [14.044697761535645, 14.820871353149414, 1  
6.738540275581308]

---



---

- \* err= 1.8771781648243049
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.0003956684485886264



For scene 12/22

- \* use LR\_NN=0.001 with err=12.361684616416326 at it=19
- \* v0\_scn\_mean = 17.87514067649869
- \* MAE = 1.8771781648243049

---



---

- Time interval n.0: [369.32, 369.52]
  - \* y\_true: [22.34117259 11.42097363]
  - \* v\_ann: [16.343530654907227, 16.467254638671875, 2 0.50893055390458]

---

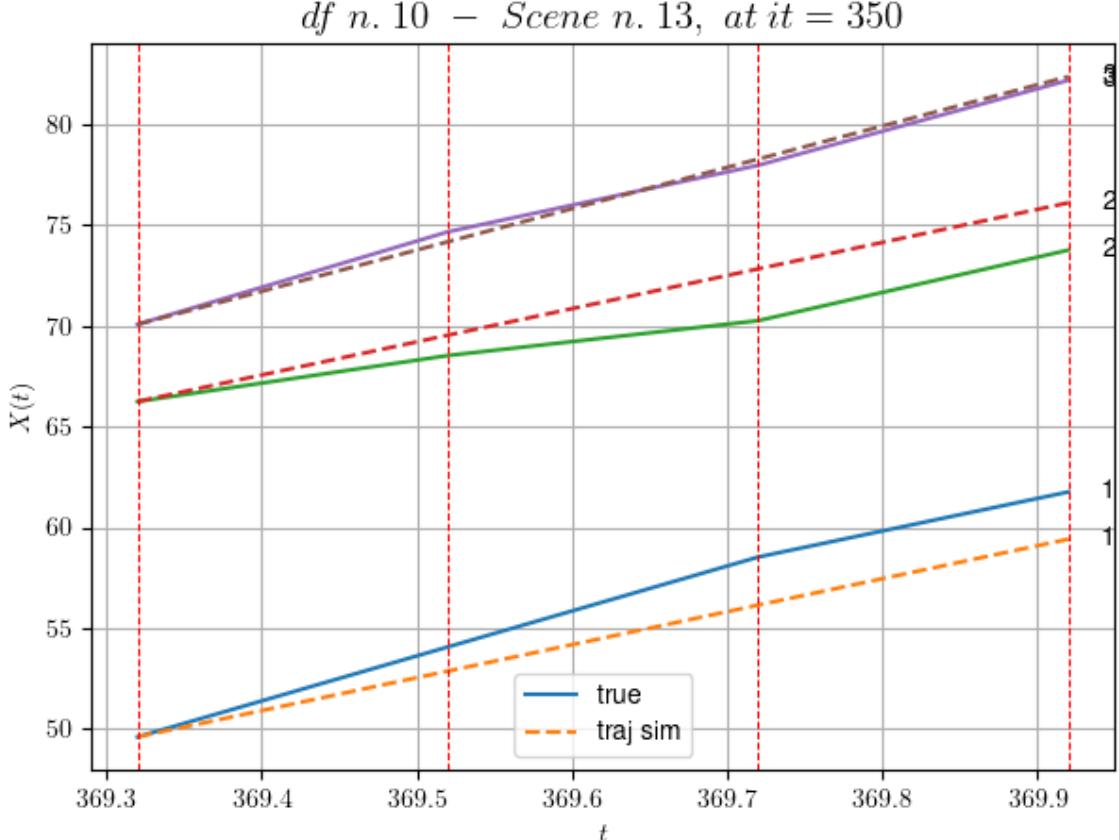
- Time interval n.1: [369.52, 369.72]
  - \* y\_true: [22.31135956 8.65079743]
  - \* v\_ann: [16.38825798034668, 16.462926864624023, 2 0.50893055390458]

---

- Time interval n.2: [369.72, 369.92]
  - \* y\_true: [16.17115552 17.53172003]
  - \* v\_ann: [16.37084197998047, 16.41187858581543, 20. 50893055390458]

---

- \* err= 2.177807054878374
- \* Learning rate NN = 5.904899080633186e-05
- \* diff = 0.0009903852696449



For scene 13/22

```
* use LR_NN=0.0001 with err=5.428282264339799 at it=19
* v0_scn_mean = 21.322381980952727
* MAE = 2.177807054878374
```

---



---

- Time interval n.0: [370.92, 371.12]
  - \* y\_true: [12.30016813 11.70074461]
  - \* v\_ann: [10.063539505004883, 9.452290534973145, 1 9.892193491627953]
  
- Time interval n.1: [371.12, 371.32]
  - \* y\_true: [ 9.3501493 10.70073785]
  - \* v\_ann: [10.363929748535156, 10.650484085083008, 1 9.892193491627953]
  
- Time interval n.2: [371.32, 371.52]
  - \* y\_true: [ 8.90016062 10.12074395]
  - \* v\_ann: [10.297874450683594, 10.596333503723145, 1 9.892193491627953]
  
- Time interval n.3: [371.52, 371.72]
  - \* y\_true: [8.30016702 9.00070559]
  - \* v\_ann: [10.16025161743164, 10.502058029174805, 1 9.892193491627953]

9.892193491627953]

---

- Time interval n.4: [371.72, 371.92]
  - \* y\_true: [15.35035581 9.32077268]
  - \* v\_ann: [9.907637596130371, 10.327547073364258, 1]

9.892193491627953]

---



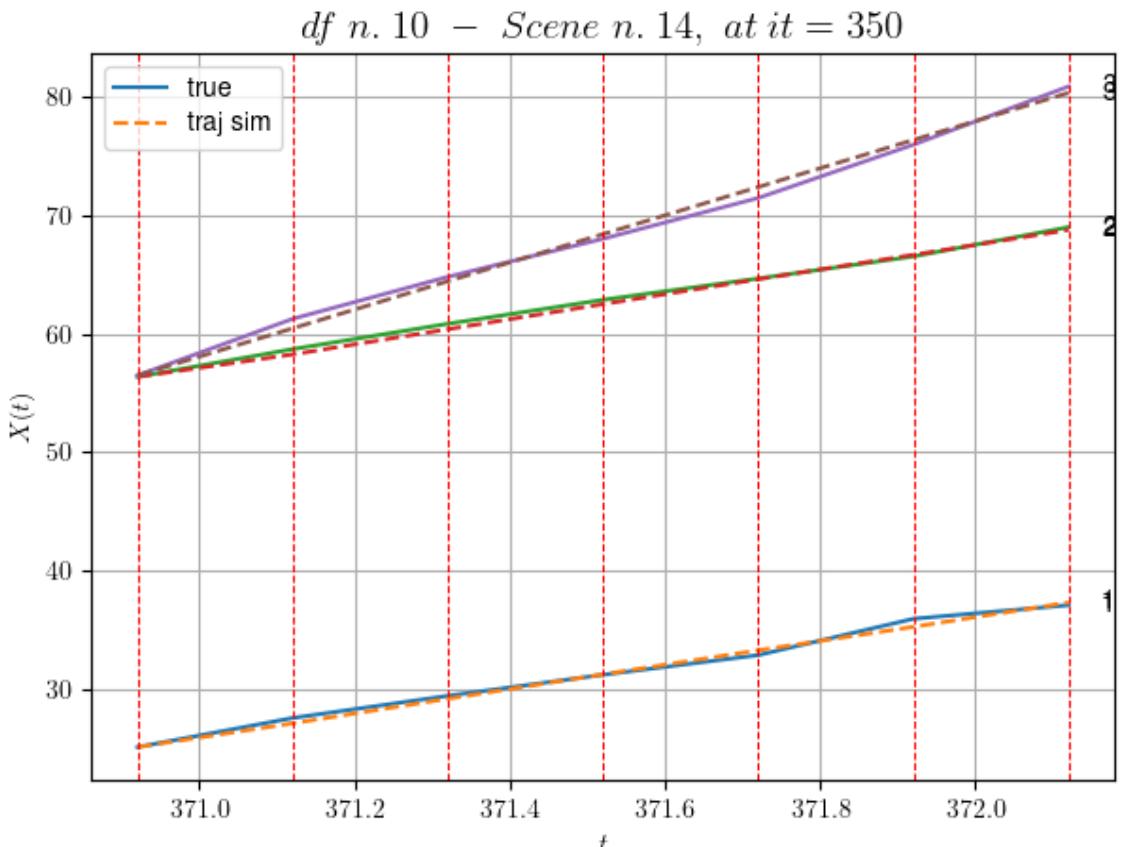
---

- Time interval n.5: [371.92, 372.12]
  - \* y\_true: [ 5.75014975 12.37110708]
  - \* v\_ann: [10.282313346862793, 10.50678825378418, 1]

9.892193491627953]

---

- \* err= 0.18143341755491926
- \* Learning rate NN = 0.00015690525469835848
- \* diff = 0.0002769741069067466



For scene 14/22

- \* use LR\_NN=0.0005 with err=31.7446297004896 at it=19
- \* v0\_scn\_mean = 20.75850362403792
- \* MAE = 0.18143341755491926

---



---

- Time interval n.0: [376.92, 377.12]
  - \* y\_true: [ 9.78017765 12.68091602]
  - \* v\_ann: [10.988422393798828, 11.036825180053711, 1]

3.629784520487759]

---

- Time interval n.1: [377.12, 377.32]
  - \* y\_true: [10.39021059 11.81092637]
  - \* v\_ann: [11.13314437866211, 11.11887264251709, 13.

629784520487759]

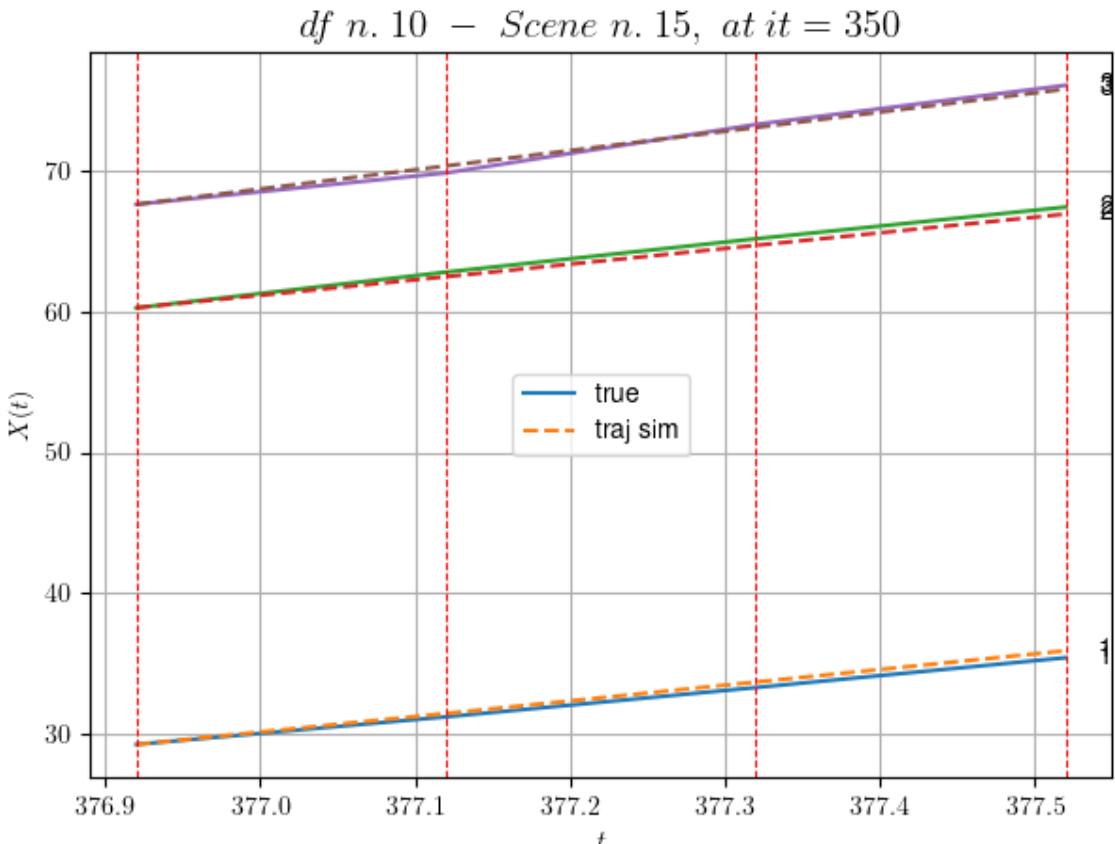
---

- Time interval n.2: [377.32, 377.52]
  - \* y\_true: [10.59024861 11.25094207]
  - \* v\_ann: [11.114956855773926, 11.109322547912598, 1

3.629784520487759]

---

- \* err= 0.11649446044564692
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 1.1139306919094594e-06



For scene 15/22

- \* use LR\_NN=0.001 with err=16.071642304221253 at it=19
- \* v0\_scn\_mean = 15.03282716162701
- \* MAE = 0.1127844485127616

---



---

- Time interval n.0: [433.52, 433.72]
  - \* y\_true: [21.56070162 24.64178312]
  - \* v\_ann: [22.70292091369629, 21.50837516784668, 21.

095742864931967]

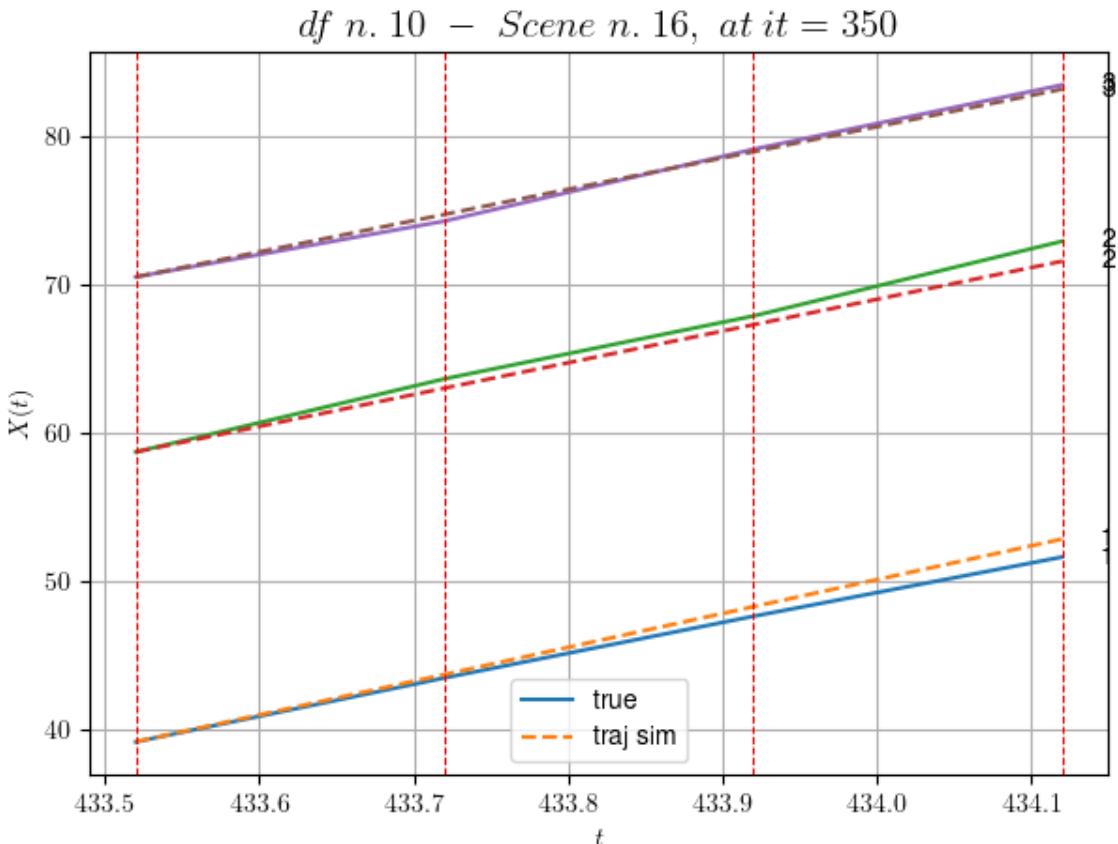
```

-----
- Time interval n.1: [433.72, 433.92]
  * y_true: [20.75082718 21.171764  ]
  * v_ann: [22.841506958007812, 21.35932731628418, 2
1.095742864931967]

-----
- Time interval n.2: [433.92, 434.12]
  * y_true: [19.97093958 25.19244807]
  * v_ann: [22.792835235595703, 21.411211013793945, 2
1.095742864931967]

-----
* err= 0.4003113016445628
* Learning rate NN = 2.952449540316593e-05
* diff = 0.00402816952168078

```



For scene 16/22  
\* use LR\_NN=5e-05 with err=7.994905063286431 at it=19  
\*  $v_0_{scn\_mean} = 21.858900348338913$   
\* MAE = 0.4003113016445628

```

=====
=====
- Time interval n.0: [483.92, 484.12]
  * y_true: [19.08092085  0.51217506]
  * v_ann: [9.765682220458984, 9.959234237670898, 22.

```

618970274116737]

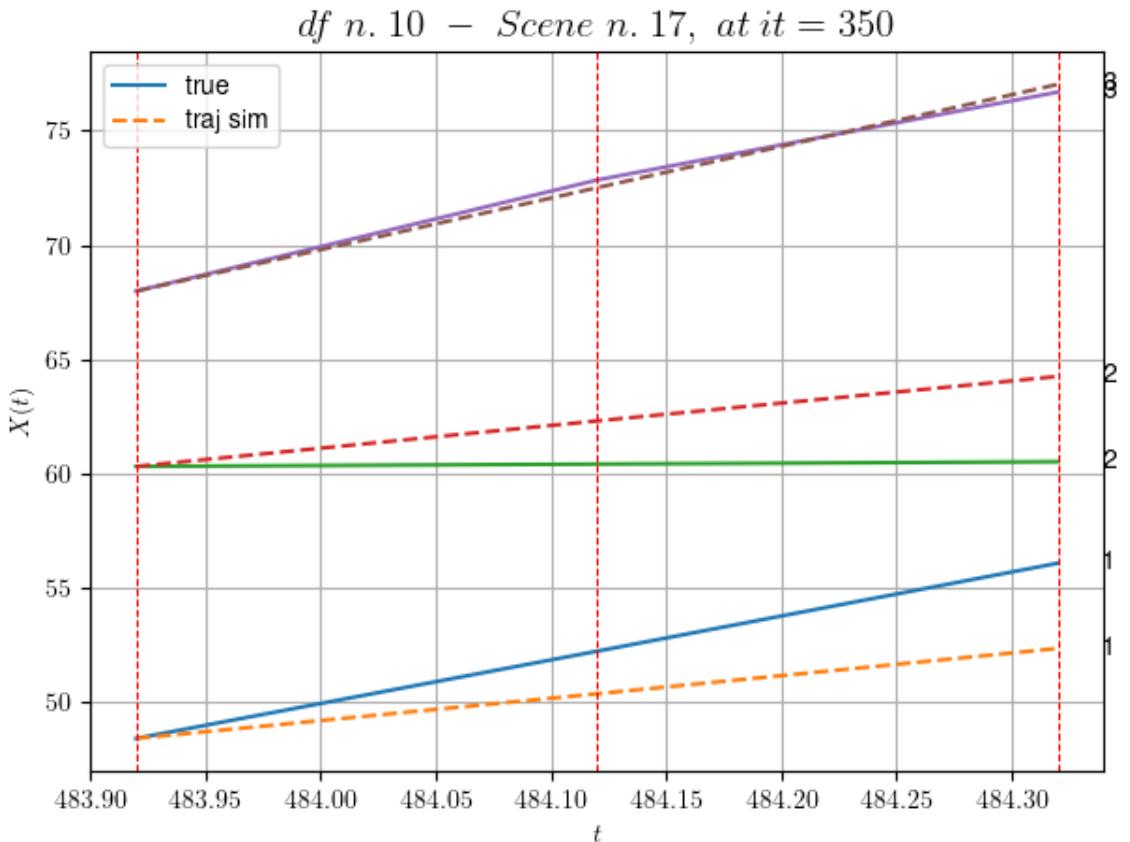
---

- Time interval n.1: [484.12, 484.32]
  - \* y\_true: [19.26103904 0.51217506]
  - \* v\_ann: [9.923405647277832, 9.729046821594238, 22.

618970274116737]

---

- \* err= 3.902046748722191
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00041378621136356486



For scene 17/22

- \* use LR\_NN=0.0005 with err=4.930089583572412 at it=19
- \* v0\_scn\_mean = 23.251576451714048
- \* MAE = 3.902046748722191

---

For scene 18/22

- \* use LR\_NN=0.0001 with err=8.871700740211539 at it=19
- \* v0\_scn\_mean = 19.277415533253297
- \* MAE = 0.4844404622281533

---

- Time interval n.0: [202.52, 202.72]

```

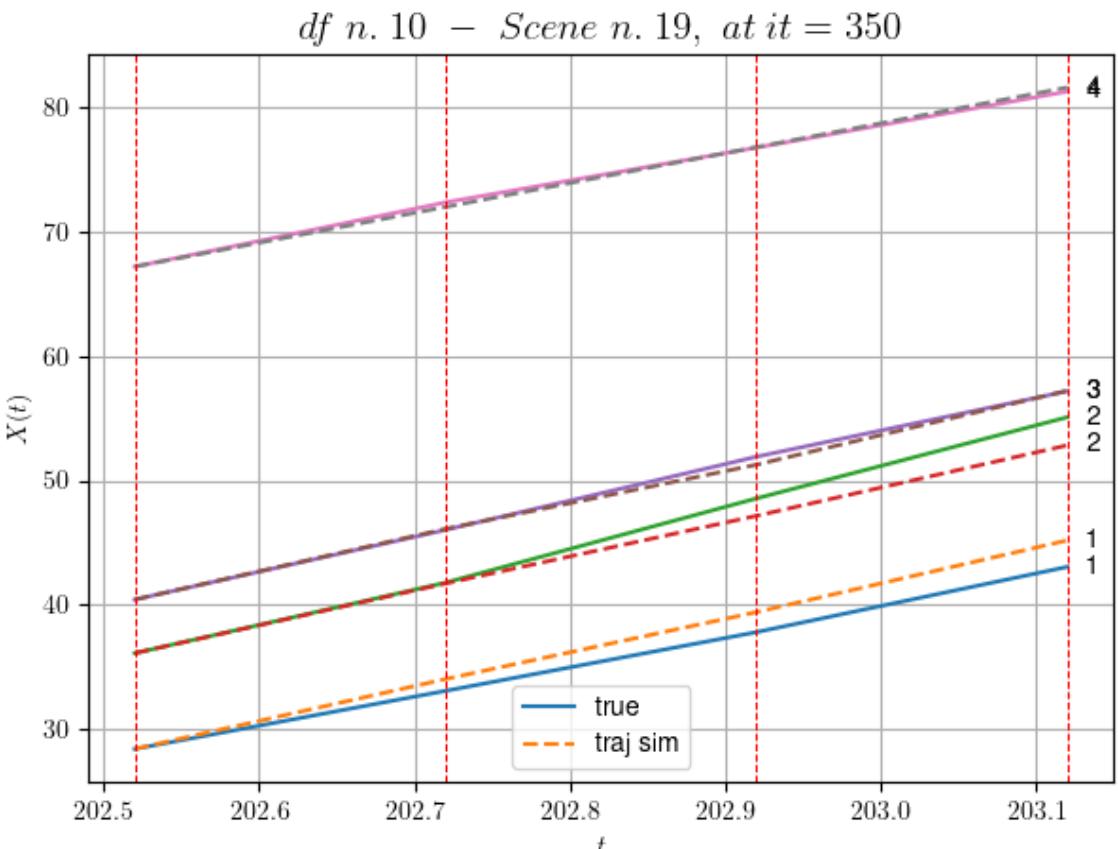
* y_true: [23.35318258 28.37081651 28.03104175]
* v_ann: [28.091442108154297, 28.029695510864258, 2
8.438875198364258, 24.014995625684776]

-----
- Time interval n.1: [202.72, 202.92]
* y_true: [23.6005682 33.85129081 29.41136895]
* v_ann: [26.915376663208008, 27.197874069213867, 2
5.798927307128906, 24.014995625684776]

-----
- Time interval n.2: [202.92, 203.12]
* y_true: [26.25082225 32.65166271 26.3315156 ]
* v_ann: [28.8505916595459, 28.35919952392578, 29.7
86714553833008, 24.014995625684776]

-----
* err= 0.9844493693378047
* Learning rate NN = 0.0005904899444431067
* diff = 1.1359388970566542e-05

```



For scene 19/22

```

* use LR_NN=0.001 with err=26.876294755428763 at it=19
* v0_scn_mean = 24.698128173240637
* MAE = 0.9844493693378047
=====
```

---



---

- Time interval n.0: [342.92, 343.12]

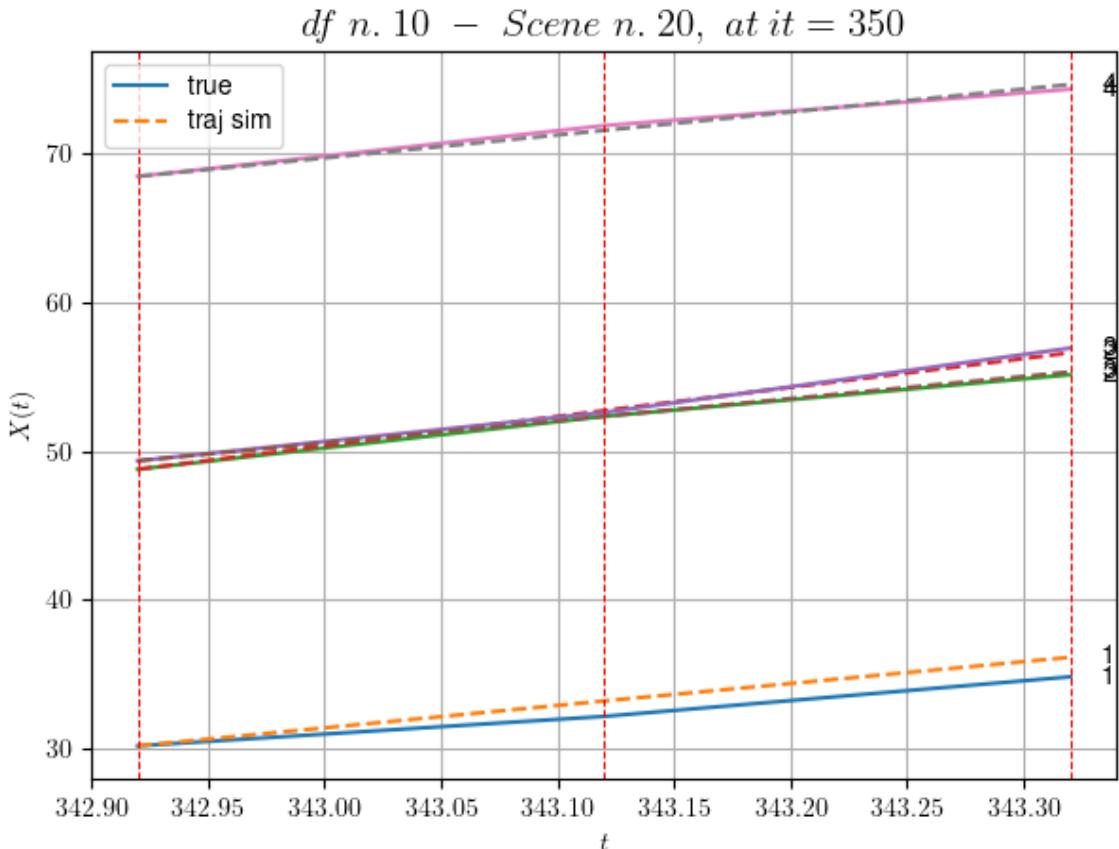
```

* y_true: [ 9.90771225 17.81228574 16.23940532]
* v_ann: [15.108668327331543, 19.760066986083984, 1
4.97243881225586, 15.473603093356406]

-----
- Time interval n.1: [343.12, 343.32]
* y_true: [13.33029638 14.00078454 21.70124661]
* v_ann: [14.692327499389648, 19.44874382019043, 1
4.920601844787598, 15.473603093356406]

-----
* err= 0.6674643094056659
* Learning rate NN = 7.289998848136747e-06
* diff = 0.007903856862470415

```



For scene 20/22

- \* use LR\_NN=1e-05 with err=9.375398244598385 at it=19
- \* v0\_scn\_mean = 17.131656104684076
- \* MAE = 0.6674643094056659

---



---

For scene 21/22

- \* use LR\_NN=0.001 with err=4.3860607933537725 at it=19
- \* v0\_scn\_mean = 20.872359945531915
- \* MAE = 0.5741463516657737

---



---

For df=10 with 22 scenes, time taken: 242.39

Time taken for the computation: 2288.63

Time taken using 1-2-1 NN structure: 2288.70

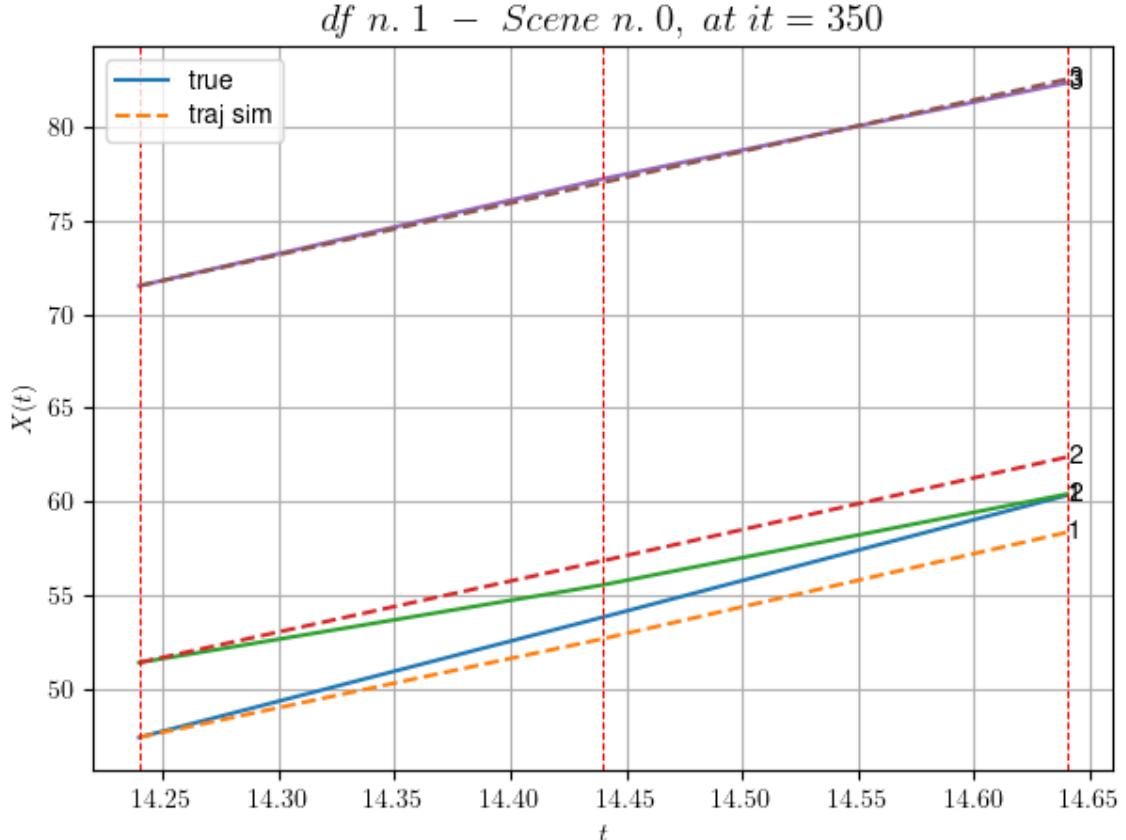
NN structure: 1-4-1

In df n.1/10 we have 28 scenes

- Time interval n.0: [14.24, 14.44]  
\* y\_true: [32.1443344 20.77111865]  
\* v\_ann: [26.359628677368164, 27.23128318786621, 2  
7.63629536512849]

- Time interval n.1: [14.44, 14.64]  
\* y\_true: [32.5721373 24.27162308]  
\* v\_ann: [28.45949935913086, 27.71408462524414, 27.  
63629536512849]

\* err= 1.2141439059107493  
\* Learning rate NN = 0.0007289999630302191  
\* diff = 0.00028843939827361



For scene 0/28

```
* use LR_NN=0.001 with err=16.769671794500457 at it=19
* v0_scn_mean = 27.838881482454525
* MAE = 1.2141439059107493
```

---



---

- Time interval n.0: [23.64, 23.84]
  - \* y\_true: [26.6509107 26.65125804]
  - \* v\_ann: [26.429601669311523, 24.976219177246094, 3  
1.18441200741597]

---

- Time interval n.1: [23.84, 24.04]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [26.825151443481445, 26.023529052734375, 3  
1.18441200741597]

---

- Time interval n.2: [24.04, 24.24]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [28.06322479248047, 27.753976821899414, 3  
1.18441200741597]

---

- Time interval n.3: [24.24, 24.44]
  - \* y\_true: [27.07699139 24.80226709]
  - \* v\_ann: [28.720874786376953, 29.66278648376465, 3

1.18441200741597]

---

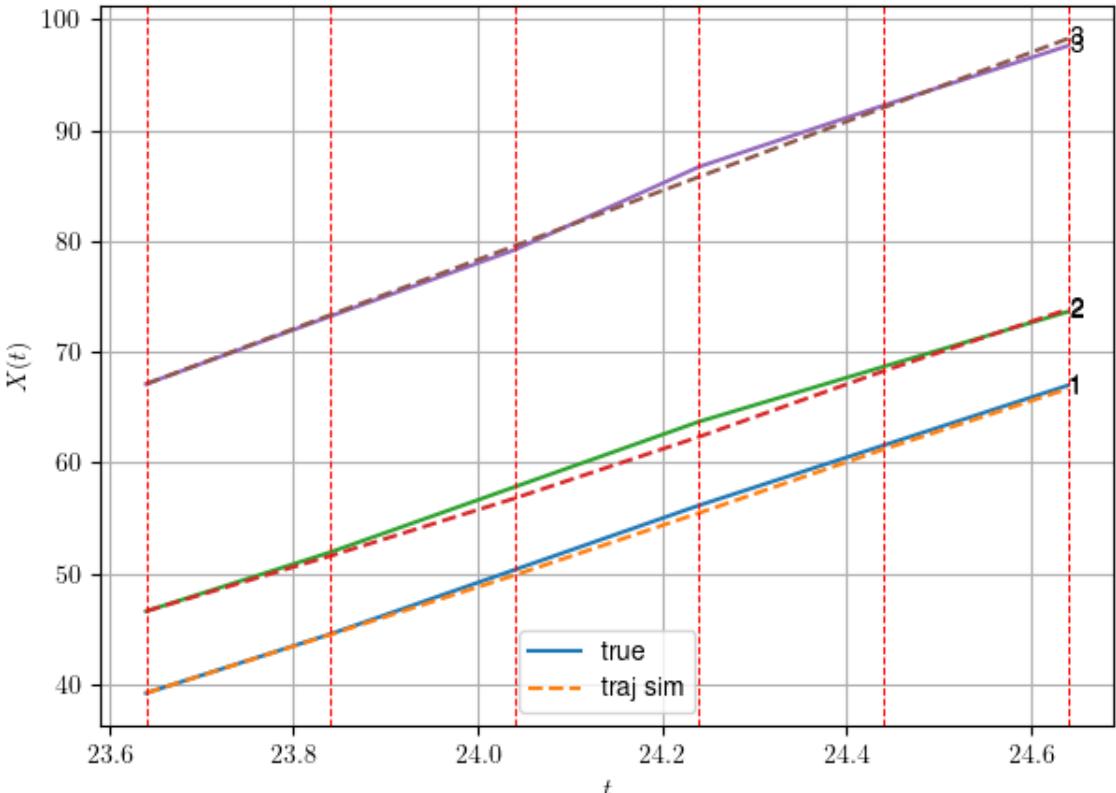
- Time interval n.4: [24.44, 24.64]
  - \* y\_true: [27.07699139 24.80226709]
  - \* v\_ann: [27.320877075195312, 27.90681266784668, 3]

1.18441200741597]

---

- \* err= 0.31175096081650916
- \* Learning rate NN = 0.0001937102060765028
- \* diff = 0.00017314342115437587

*df n. 1 – Scene n. 1, at it = 350*



For scene 1/28

- \* use LR\_NN=0.0005 with err=32.327263158187556 at it=19
- \* v0\_scn\_mean = 31.082899565312655
- \* MAE = 0.21478339402322164

---

8.2509332124626]

---

- Time interval n.0: [72.44, 72.64]
  - \* y\_true: [25.85001228 31.10049693]
  - \* v\_ann: [27.170948028564453, 28.41912841796875, 2]

---

- Time interval n.1: [72.64, 72.84]
  - \* y\_true: [30.00006309 33.82077482]
  - \* v\_ann: [27.299518585205078, 28.632545471191406, 2]

```
8.2509332124626]
```

```
- Time interval n.2: [72.84, 73.04]
  * y_true: [23.75011307 26.19081077]
  * v_ann: [28.395627975463867, 28.955310821533203, 2
```

```
8.2509332124626]
```

```
- Time interval n.3: [73.04, 73.24]
  * y_true: [29.90025591 27.11111625]
  * v_ann: [27.211978912353516, 28.33621597290039, 2
```

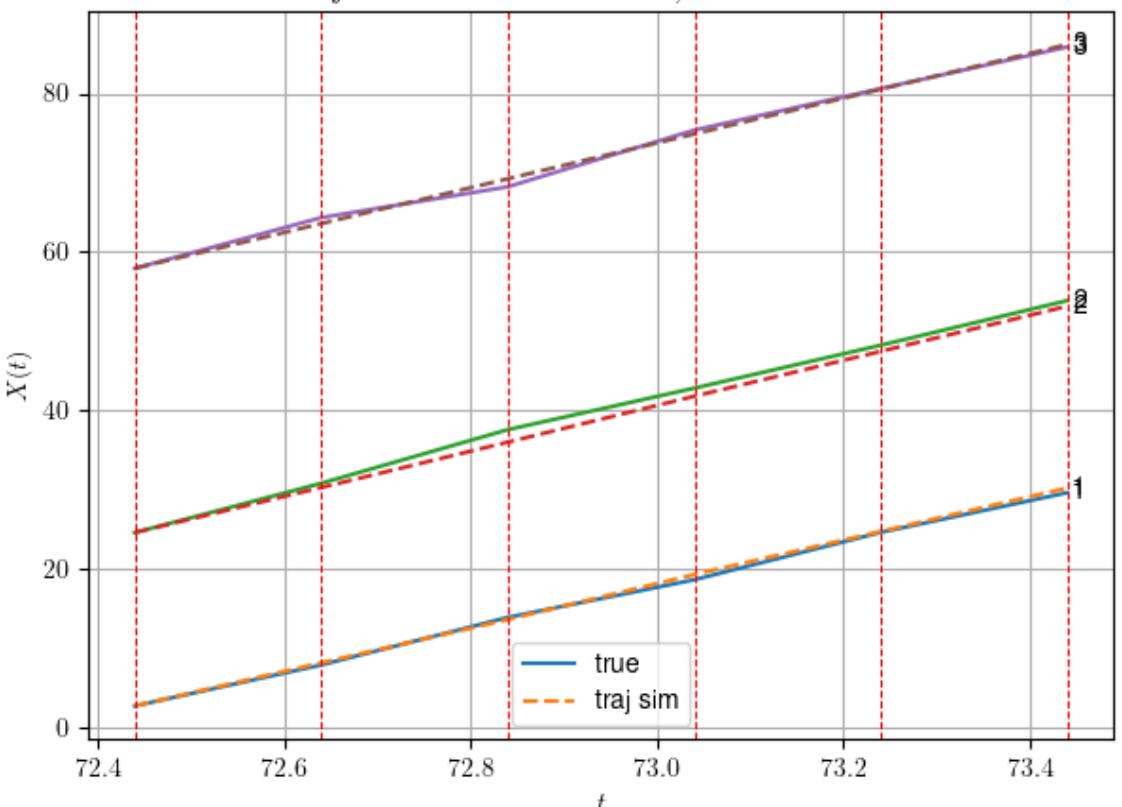
```
8.2509332124626]
```

```
- Time interval n.4: [73.24, 73.44]
  * y_true: [25.05033948 28.161422 ]
  * v_ann: [27.439891815185547, 28.47284507751465, 2
```

```
8.2509332124626]
```

```
* err= 0.4327110690245665
* Learning rate NN = 1.9371018424862996e-05
* diff = 0.0017709822545478593
```

*df n. 1 – Scene n. 2, at it = 350*



For scene 2/28

```
* use LR_NN=5e-05 with err=3.364350240455405 at it=19
* v0_scn_mean = 28.400840541916434
* MAE = 0.3228657775402899
```

```

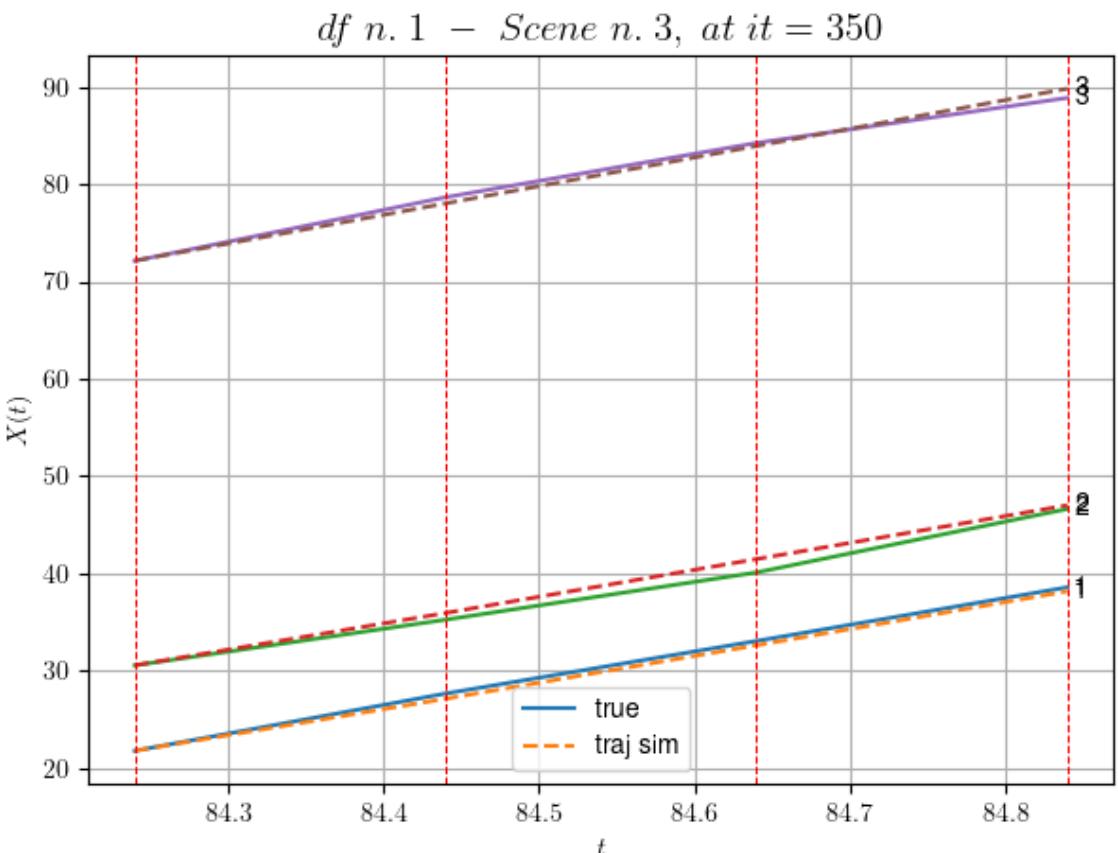
=====
=====
- Time interval n.0: [84.24, 84.44]
  * y_true: [29.4403562 23.48047527]
  * v_ann: [26.760515213012695, 26.931514739990234, 2
9.494369247210926]

-----
- Time interval n.1: [84.44, 84.64]
  * y_true: [27.01049004 24.28067739]
  * v_ann: [27.500022888183594, 27.701833724975586, 2
9.494369247210926]

-----
- Time interval n.2: [84.64, 84.84]
  * y_true: [27.60069732 32.65118399]
  * v_ann: [27.725116729736328, 27.661216735839844, 2
9.494369247210926]

-----
* err= 0.37916192415536165
* Learning rate NN = 2.952449540316593e-05
* diff = 7.014708211128262e-06

```



For scene 3/28

```

* use LR_NN=5e-05 with err=23.140751211158655 at it=19
* v0_scn_mean = 29.53770536014879
* MAE = 0.37847415193587103

```

```

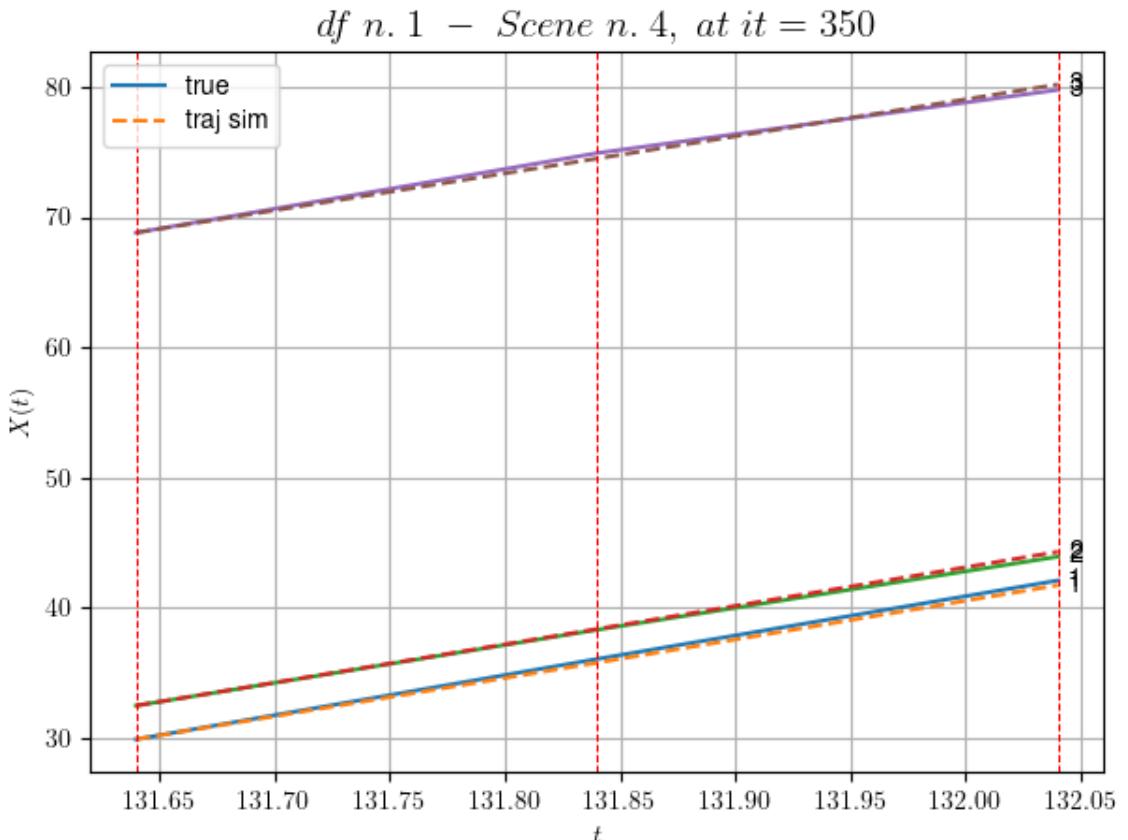
=====
=====

    - Time interval n.0: [131.64, 131.84]
      * y_true: [30.80073929 29.11067519]
      * v_ann: [29.38424301147461, 29.404193878173828, 2
8.44290395364265]

-----
    - Time interval n.1: [131.84, 132.04]
      * y_true: [30.16079766 28.07097758]
      * v_ann: [29.76184844970703, 29.6622314453125, 28.4
4290395364265]

-----
* err= 0.07838335106733772
* Learning rate NN = 3.6449993785936385e-05
* diff = 4.985146622073222e-05

```



For scene 4/28  
\* use LR\_NN=5e-05 with err=17.313395037608885 at it=19  
\* v0\_scn\_mean = 28.576358039945283  
\* MAE = 0.06018140970429623

```

=====
=====

    - Time interval n.0: [148.04, 148.24]
      * y_true: [21.93113488 25.90203153]
      * v_ann: [26.542640686035156, 25.993541717529297, 2

```

7.6216739067253]

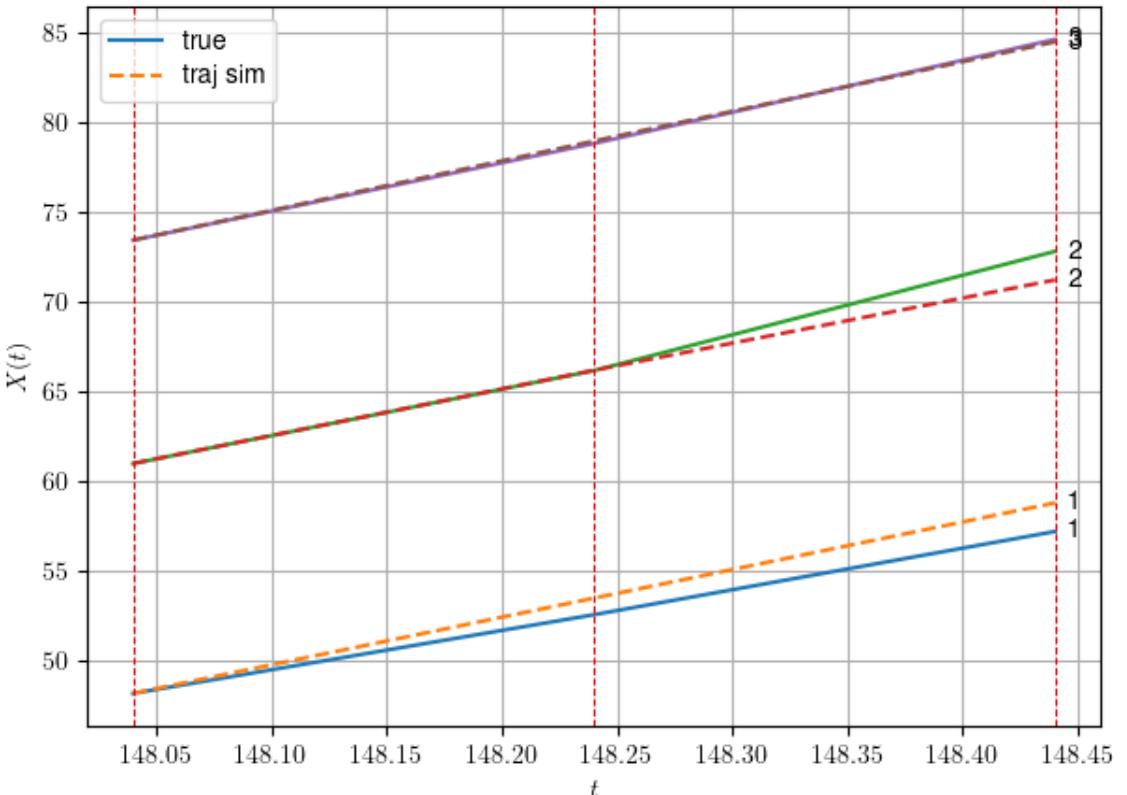
---

- Time interval n.1: [148.24, 148.44]
  - \* y\_true: [23.17638158 33.20310746]
  - \* v\_ann: [26.53440284729004, 25.15172004699707, 27.6216739067253]

---

- \* err= 0.6628321137689659
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00013400883228753546

*df n. 1 – Scene n. 5, at it = 350*



For scene 5/28

- \* use LR\_NN=0.0005 with err=0.8251024761049065 at it=19
- \* v0 scn mean = 27.825513185907518
- \* MAE = 0.6615304150455181

---



---

- Time interval n.0: [161.64, 161.84]
  - \* y\_true: [31.66062591 25.70084842]
  - \* v\_ann: [27.94440460205078, 27.186717987060547, 34.711781151250925]

---

- Time interval n.1: [161.84, 162.04]
  - \* y\_true: [29.96082912 27.30094687]
  - \* v\_ann: [29.413965225219727, 30.018882751464844, 33]

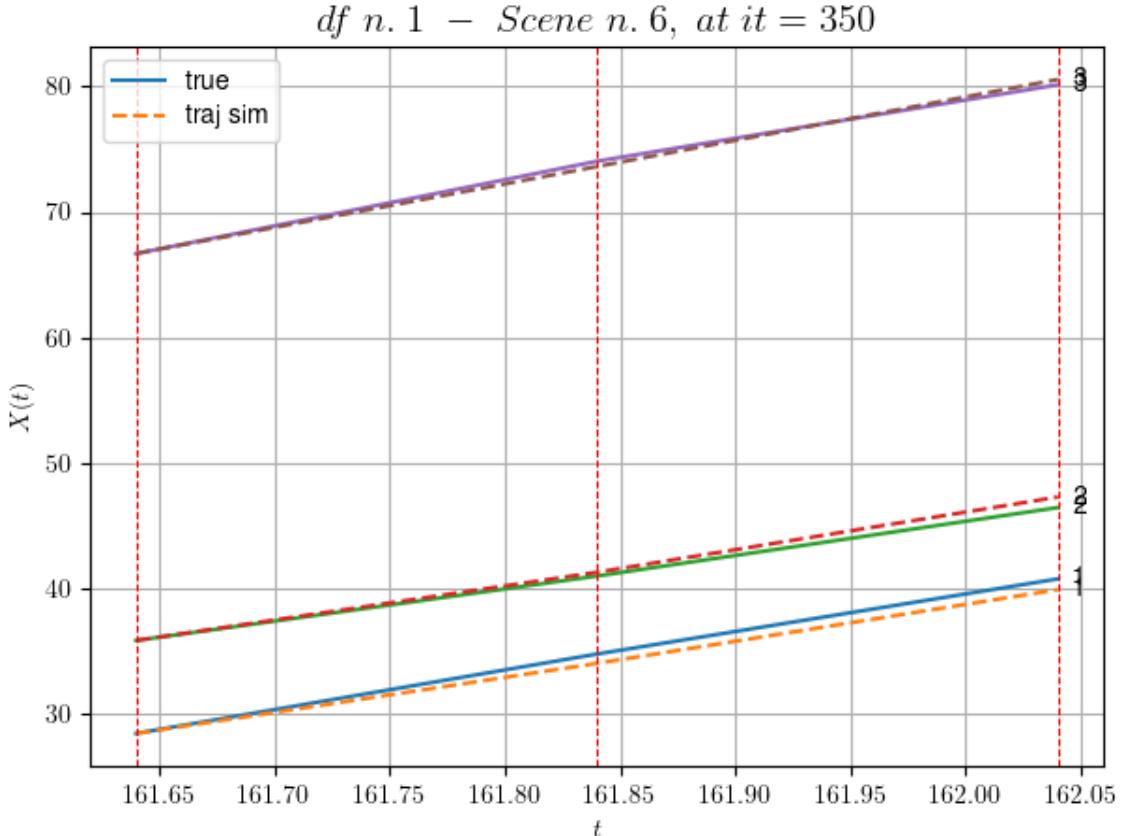
4.711781151250925]

---



---

- \* err= 0.27033559496257753
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00024122754106215155



For scene 6/28

- \* use LR\_NN=0.0005 with err=13.5285674413551 at it=19
- \* v0\_scn\_mean = 34.30794835630702
- \* MAE = 0.26823254779709094

---



---

- Time interval n.0: [164.04, 164.24]
- \* y\_true: [27.950014 32.5307084]
- \* v\_ann: [21.698041915893555, 27.97955894470215, 3

2.43283336687095]

---



---

- Time interval n.1: [164.24, 164.44]
- \* y\_true: [26.70005561 31.43096027]
- \* v\_ann: [28.1053466796875, 34.719669342041016, 32.

43283336687095]

---



---

- Time interval n.2: [164.44, 164.64]
- \* y\_true: [26.20012328 27.61110245]
- \* v\_ann: [24.415502548217773, 31.588787078857422, 3

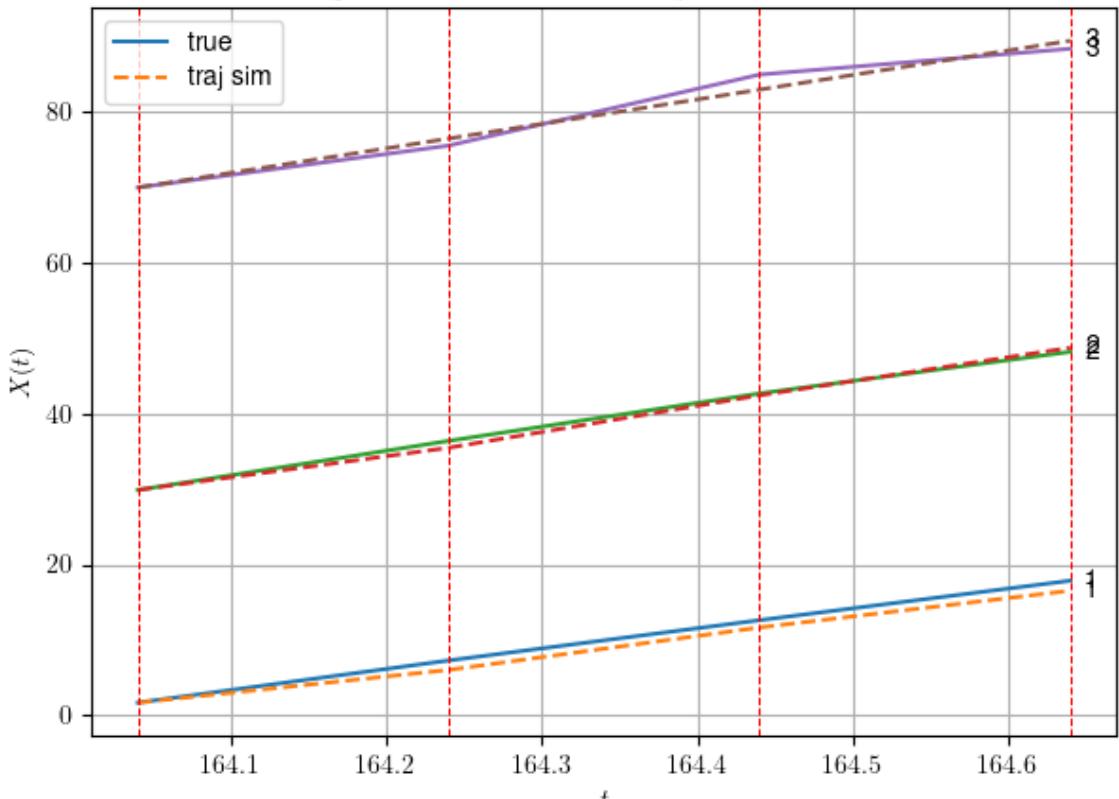
2.43283336687095]

```

* err= 0.9516074055644953
* Learning rate NN = 0.0002952449722215533
* diff = 0.0016247239430597915

```

*df n. 1 – Scene n. 7, at it = 350*



For scene 7/28

```

* use LR_NN=0.0005 with err=1.5530398760839461 at it=19
* v0_scn_mean = 32.224322430849156
* MAE = 0.8660878910996882

```

For scene 8/28

```

* use LR_NN=0.0001 with err=1.3485963046989573 at it=19
* v0_scn_mean = 36.0867561570375
* MAE = 0.01803622411424836

```

```

- Time interval n.0: [216.64, 216.84]
  * y_true: [37.52054047 34.13112536]
  * v_ann: [29.754173278808594, 39.90424346923828, 3
4.851790052280656]

```

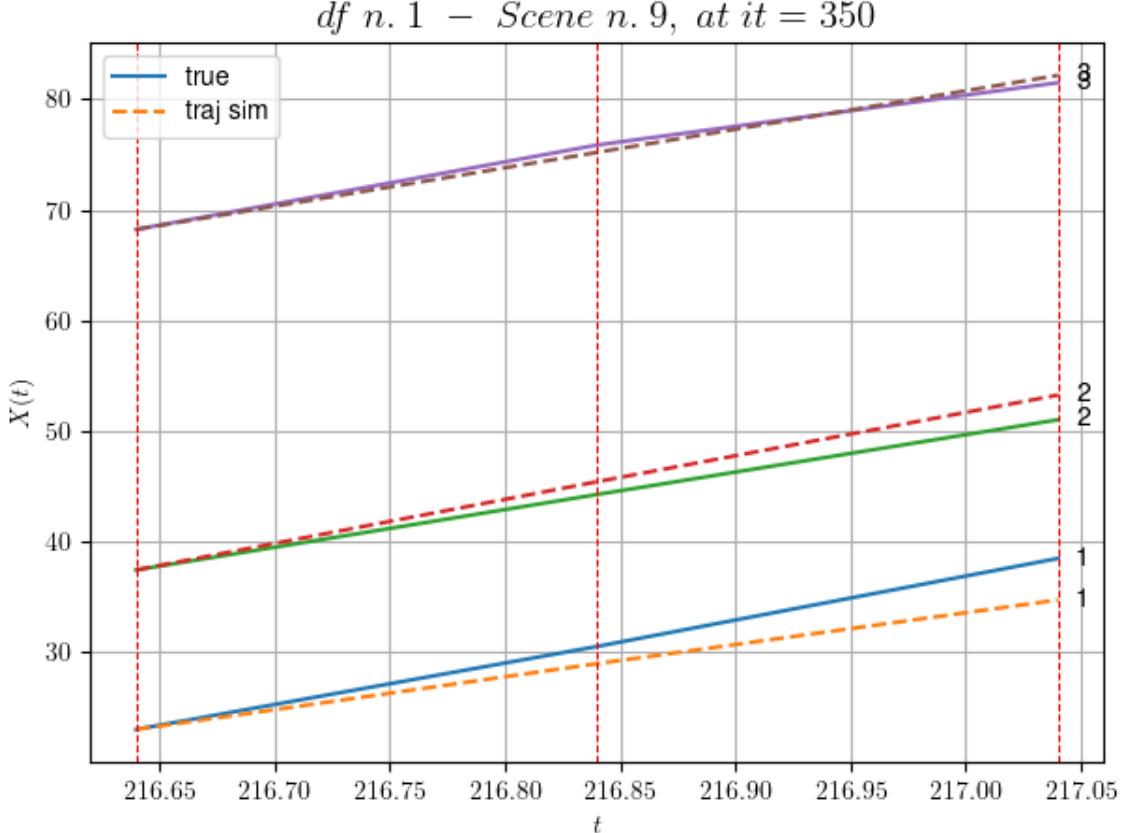
```

- Time interval n.1: [216.84, 217.04]
  * y_true: [39.83095433 33.81148861]

```

```
* v_ann: [28.80957794189453, 39.2108039855957, 34.8
51790052280656]
```

```
-----  
-----  
* err= 2.6381451302509515  
* Learning rate NN = 7.289998757187277e-05  
* diff = 0.05144005416135
```



For scene 9/28

```
* use LR_NN=0.0001 with err=9.90049569268831 at it=19
* v0_scn_mean = 34.43595750947053
* MAE = 2.6381451302509515
```

```
=====
=====
```

- Time interval n.0: [240.64, 240.84]
  - \* y\_true: [28.54090912 24.62265201]
  - \* v\_ann: [35.24565124511719, 28.28492546081543, 33.

34474567234028]

```
=====
=====
```

- Time interval n.1: [240.84, 241.04]
  - \* y\_true: [33.36143299 35.0745887 ]
  - \* v\_ann: [27.441059112548828, 25.70730972290039, 3

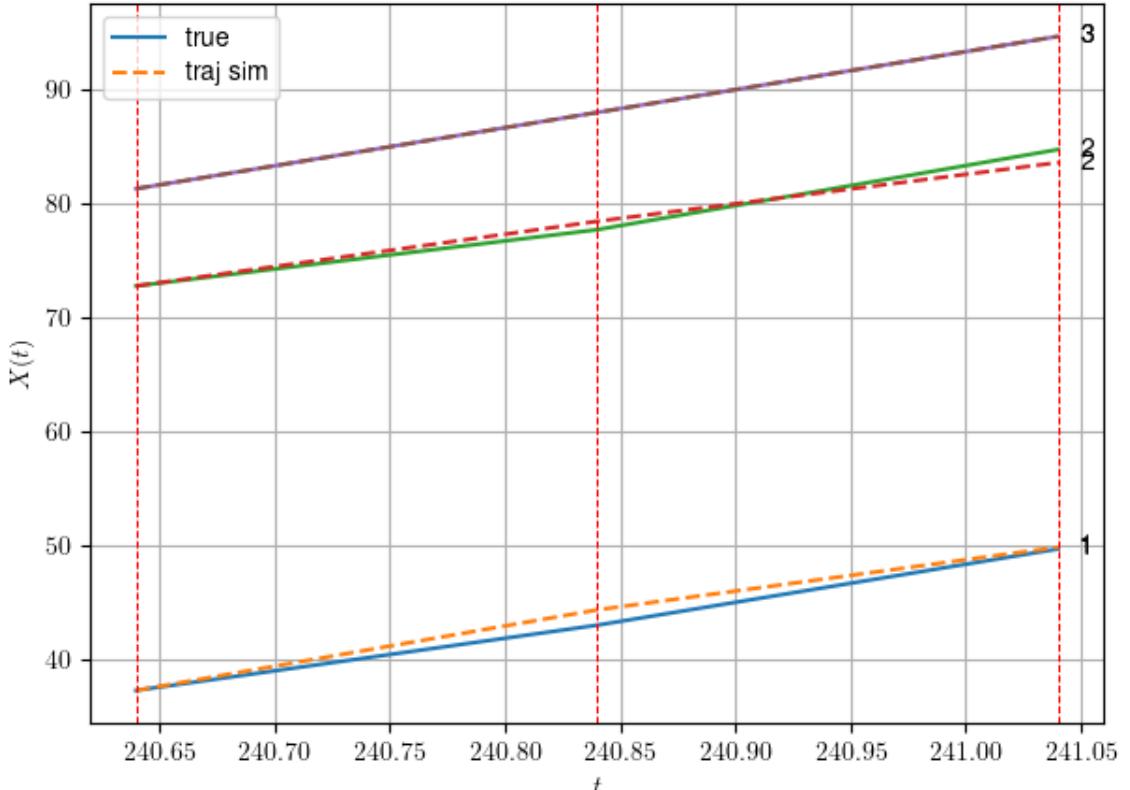
3.34474567234028]

```
=====
=====
```

- \* err= 0.40680245725400527
  - \* Learning rate NN = 7.289998757187277e-05

\* diff = 0.004242113380434787

df n. 1 - Scene n. 10, at it = 350



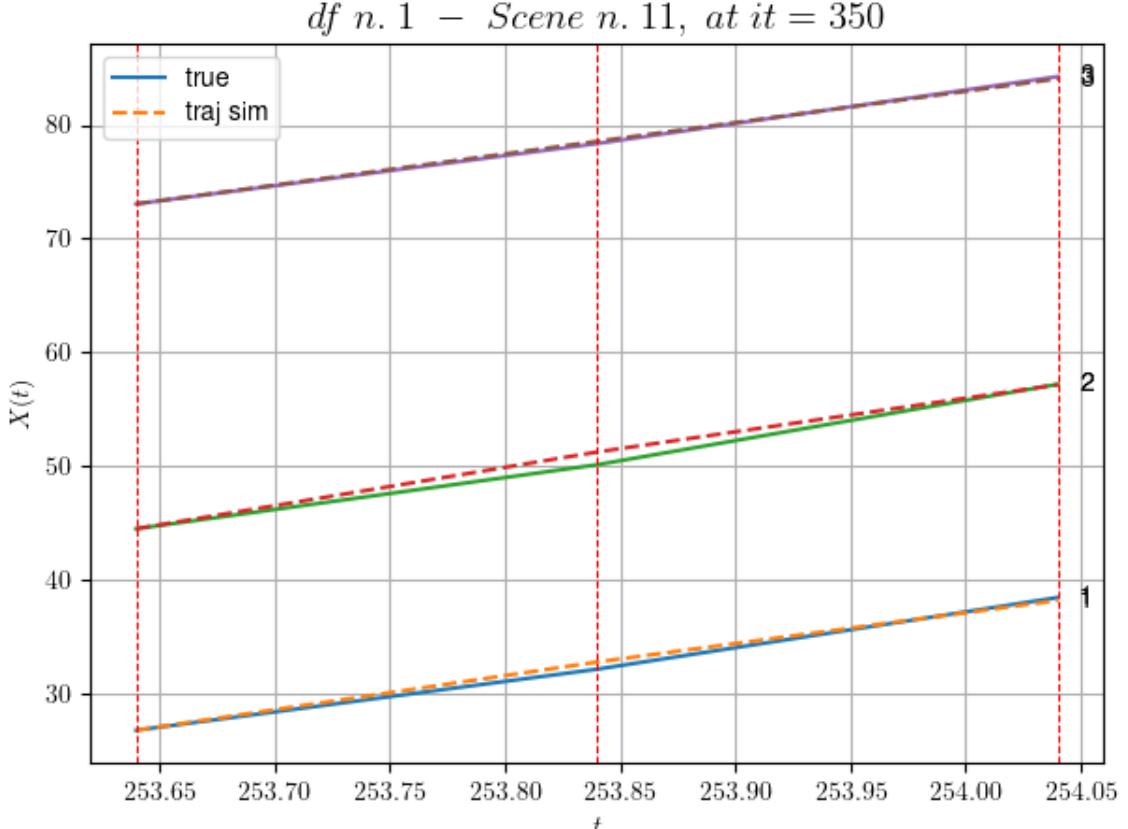
For scene 10/28

\* use LR\_NN=0.0001 with err=8.873459952557758 at it=19  
 \* v0\_scn\_mean = 33.05807743587603  
 \* MAE = 0.40680245725400527

- Time interval n.0: [253.64, 253.84]  
 \* y\_true: [26.81042151 28.10122634]  
 \* v\_ann: [29.9593505859375, 33.69296646118164, 27.474897828445823]

- Time interval n.1: [253.84, 254.04]  
 \* y\_true: [31.5007643 35.35225595]  
 \* v\_ann: [27.059694290161133, 29.57805061340332, 27.474897828445823]

\* err= 0.1994391881518528  
 \* Learning rate NN = 7.289998757187277e-05  
 \* diff = 0.00012695291797404362



For scene 11/28

\* use LR\_NN=0.0001 with err=1.6875544636975637 at it=19  
 \* v0\_scn\_mean = 27.691316850195935  
 \* MAE = 0.1986879011802645

- 
- 
- Time interval n.0: [262.64, 262.84]
    - \* y\_true: [36.75102901 34.57147294]
    - \* v\_ann: [29.869077682495117, 28.443233489990234, 3 5.93105457034953]

---

  - Time interval n.1: [262.84, 263.04]
    - \* y\_true: [20.65076329 34.76181544]
    - \* v\_ann: [33.210289001464844, 34.40570831298828, 3 5.93105457034953]

---

  - Time interval n.2: [263.04, 263.24]
    - \* y\_true: [40.30193432 23.95156631]
    - \* v\_ann: [28.445003509521484, 28.618223190307617, 3 5.93105457034953]

---

  - Time interval n.3: [263.24, 263.44]
    - \* y\_true: [32.10201673 27.4721836 ]
    - \* v\_ann: [31.576017379760742, 33.744869232177734, 3 5.93105457034953]

5.93105457034953]

---

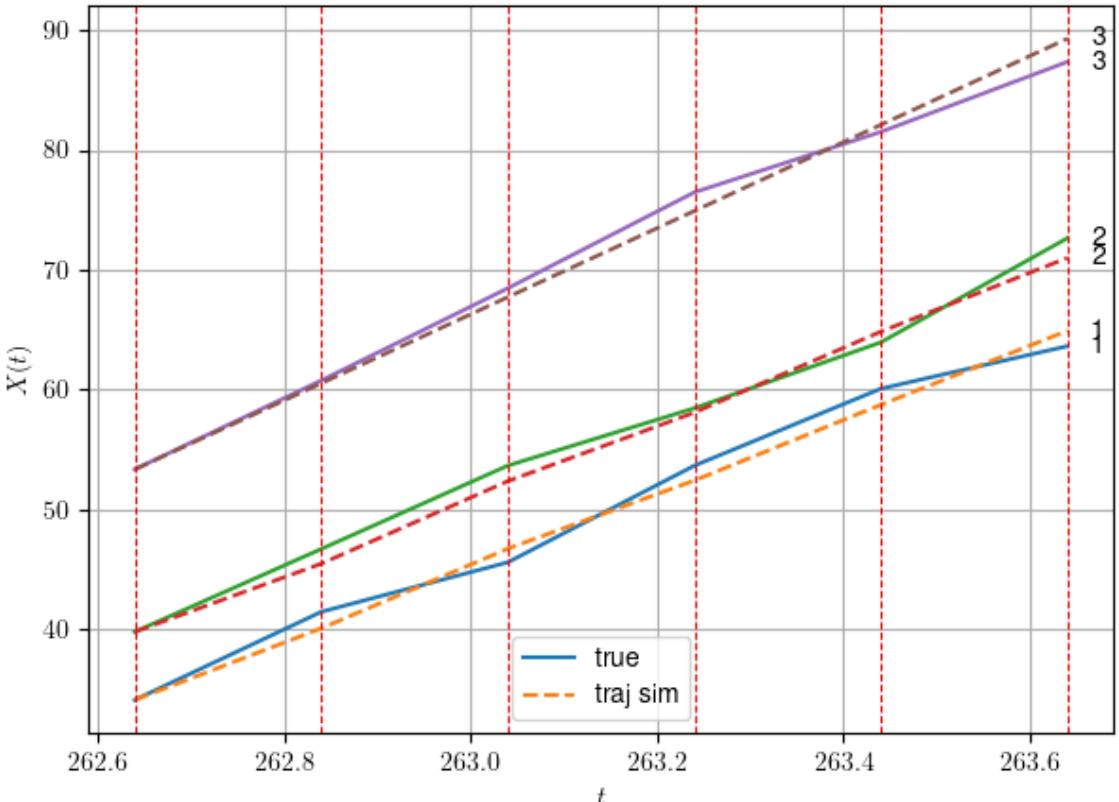
- Time interval n.4: [263.44, 263.64]
  - \* y\_true: [17.75131644 43.4543127 ]
  - \* v\_ann: [30.874704360961914, 30.75364112854004, 3

5.93105457034953]

---

- \* err= 1.228023974619015
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 0.005813431247557732

*df n. 1 – Scene n. 12, at it = 350*



For scene 12/28

- \* use LR\_NN=0.001 with err=29.40161395650682 at it=19
- \* v0\_scn\_mean = 35.42272146505022
- \* MAE = 1.228023974619015

---



---

- Time interval n.0: [314.84, 315.04]
  - \* y\_true: [29.62016755 31.54681236]
  - \* v\_ann: [29.9865779876709, 29.568817138671875, 30.92624116601543]

---



---

- Time interval n.1: [315.04, 315.24]
  - \* y\_true: [30.12030665 32.32740505]
  - \* v\_ann: [31.302814483642578, 30.931747436523438, 3

0.92624116601543]

---

- Time interval n.2: [315.24, 315.44]
  - \* y\_true: [25.99040223 31.02242591]
  - \* v\_ann: [31.546466827392578, 31.348831176757812, 3

0.92624116601543]

---

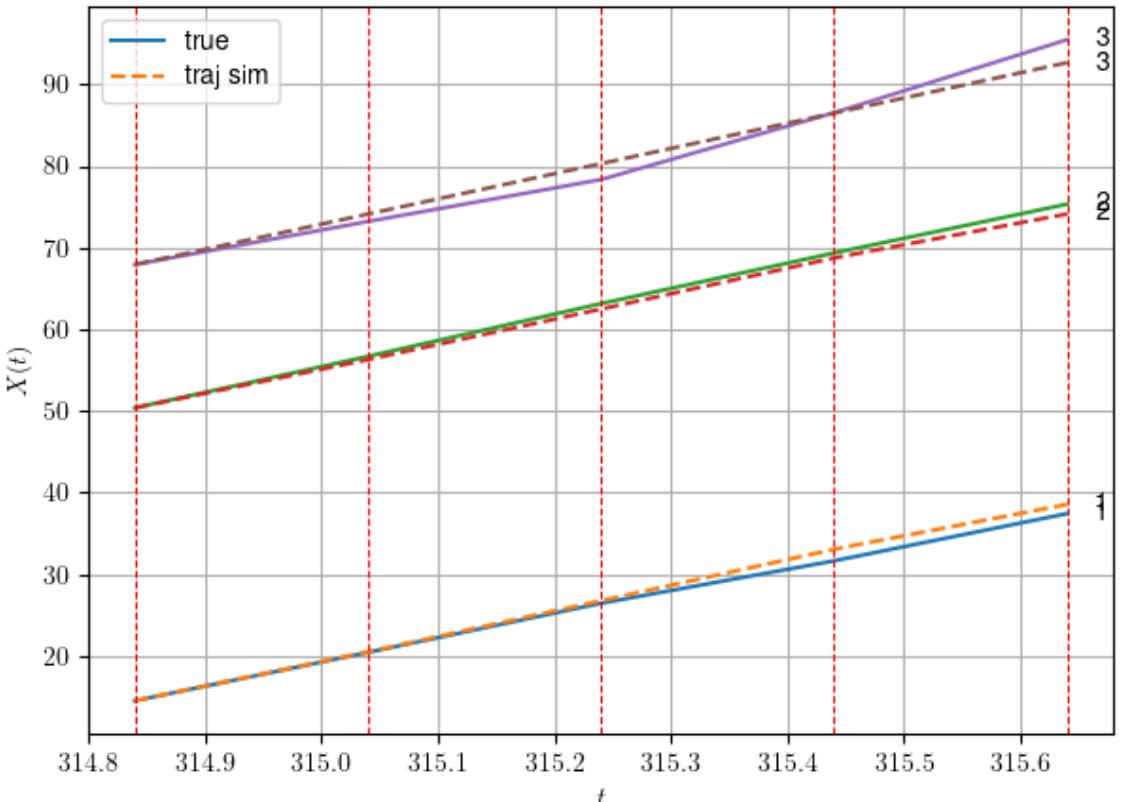
- Time interval n.3: [315.44, 315.64]
  - \* y\_true: [28.95064907 29.88823464]
  - \* v\_ann: [27.474802017211914, 26.9367618560791, 30.

92624116601543]

---

- \* err= 1.2273109974434153
- \* Learning rate NN = 0.000239148415857926
- \* diff = 0.0018369297809435192

*df n. 1 – Scene n. 13, at it = 350*



For scene 13/28

- \* use LR\_NN=0.0005 with err=21.374523241188726 at it=19
- \* v0\_scn\_mean = 30.846855781410746
- \* MAE = 1.2199289446199988

---



---

- Time interval n.0: [325.24, 325.44]
  - \* y\_true: [29.06068603 28.85087529]
  - \* v\_ann: [29.05036735534668, 28.499309539794922, 2

```
9.804035226087482]
```

```
-----  
-----  
- Time interval n.1: [325.44, 325.64]  
* y_true: [28.37089255 31.80128105]  
* v_ann: [29.11863899230957, 28.484560012817383, 2  
9.804035226087482]
```

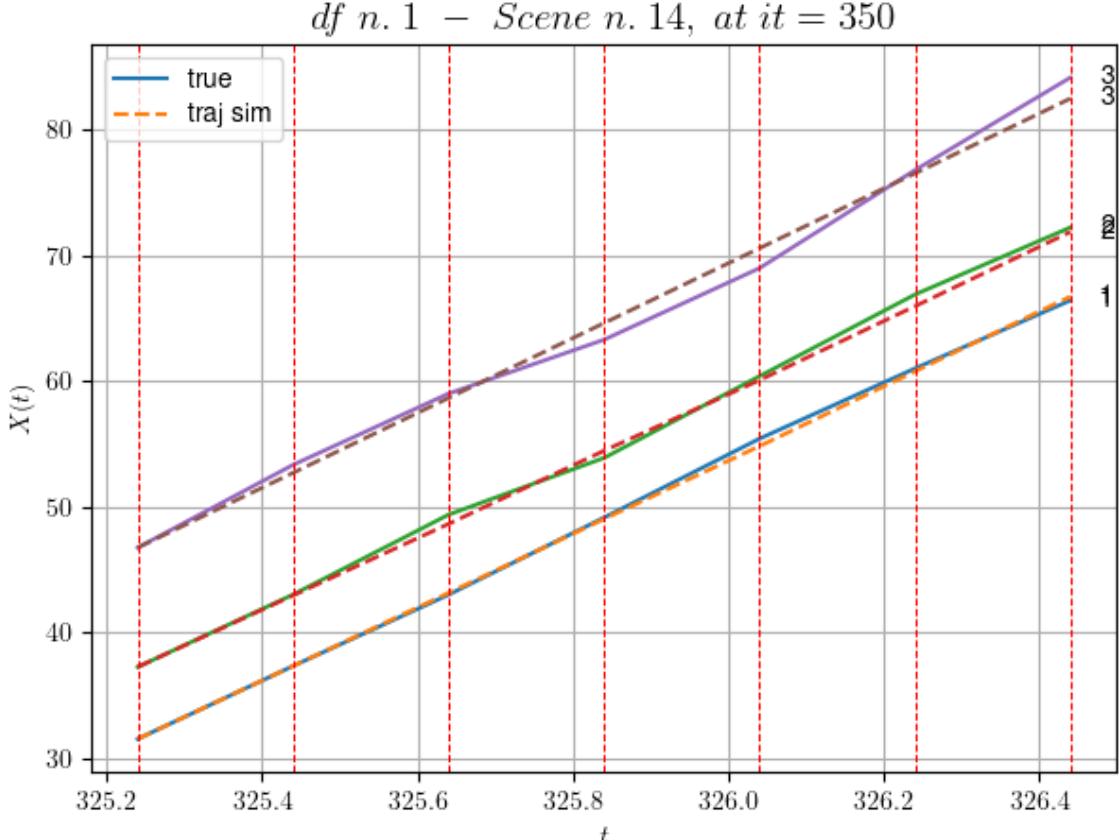
```
-----  
-----  
- Time interval n.2: [325.64, 325.84]  
* y_true: [30.70143178 22.60113815]  
* v_ann: [29.413434982299805, 29.12793731689453, 2  
9.804035226087482]
```

```
-----  
-----  
- Time interval n.3: [325.84, 326.04]  
* y_true: [31.42655806 32.52725213]  
* v_ann: [29.007585525512695, 28.100627899169922, 2  
9.804035226087482]
```

```
-----  
-----  
- Time interval n.4: [326.04, 326.24]  
* y_true: [27.9669351 32.52725213]  
* v_ann: [29.76312828063965, 29.437124252319336, 2  
9.804035226087482]
```

```
-----  
-----  
- Time interval n.5: [326.24, 326.44]  
* y_true: [27.10202936 26.72764736]  
* v_ann: [29.81644058227539, 29.607778549194336, 2  
9.804035226087482]
```

```
* err= 0.4837096481839984  
* Learning rate NN = 0.00031381050939671695  
* diff = 0.0001335393040359789
```



For scene 14/28

- \* use LR\_NN=0.001 with err=14.399630691414233 at it=19
- \* v0\_scn\_mean = 29.820830785944874
- \* MAE = 0.4799406504122279

---



---

- Time interval n.0: [354.04, 354.24]
- \* y\_true: [29.77169216 32.15176545]
- \* v\_ann: [28.658069610595703, 26.47397232055664, 3  
2.69350270999544]

---



---

- Time interval n.1: [354.24, 354.44]
- \* y\_true: [35.38251939 26.55179403]
- \* v\_ann: [29.614845275878906, 30.336078643798828, 3  
2.69350270999544]

---



---

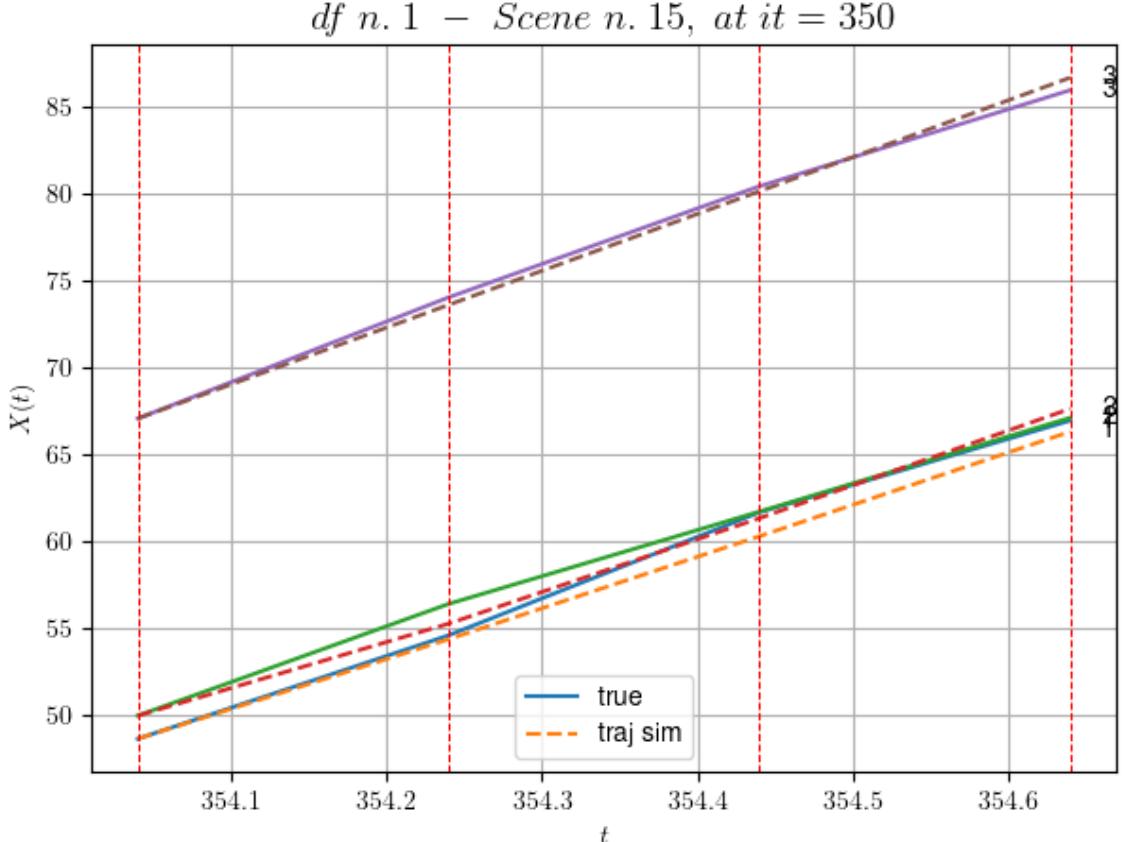
- Time interval n.2: [354.44, 354.64]
- \* y\_true: [26.40441101 27.01000163]
- \* v\_ann: [30.10340118408203, 31.507225036621094, 3  
2.69350270999544]

---



---

- \* err= 0.40339582686156533
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 3.596784670067965e-05



For scene 15/28

\* use LR\_NN=0.001 with err=30.73958135176689 at it=19  
 \* v0\_scn\_mean = 32.46265057729951  
 \* MAE = 0.40339582686156533

---



---

- Time interval n.0: [363.44, 363.64]  
 \* y\_true: [23.6502752 28.55056389]  
 \* v\_ann: [29.51182746887207, 28.969181060791016, 3  
 8.923429963342016]

---

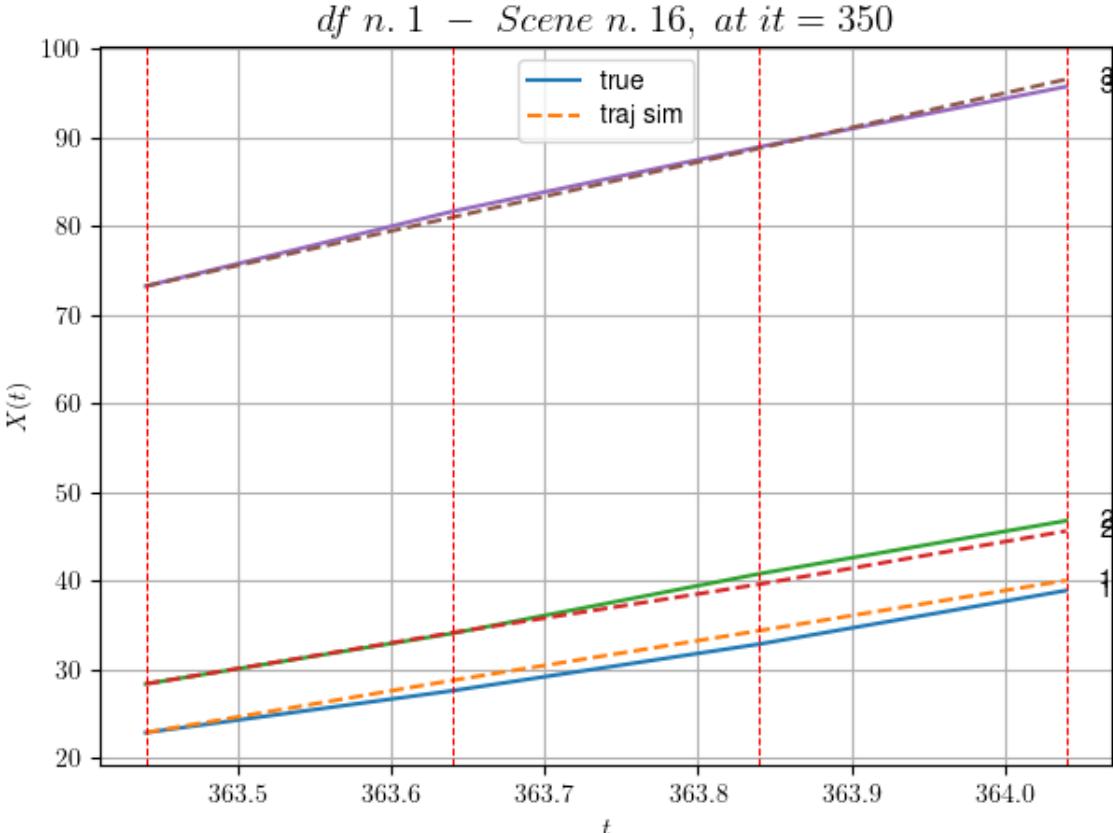
- Time interval n.1: [363.64, 363.84]  
 \* y\_true: [26.3393983 33.66093634]  
 \* v\_ann: [28.035409927368164, 27.320999145507812, 3  
 8.923429963342016]

---

- Time interval n.2: [363.84, 364.04]  
 \* y\_true: [30.2407755 29.94110461]  
 \* v\_ann: [28.37066650390625, 30.080699920654297, 3  
 8.923429963342016]

---

\* err= 0.7358582186303503  
 \* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.0004450095895782713



For scene 16/28

```
* use LR_NN=0.0005 with err=24.188063191029197 at it=19
* v0_scn_mean = 38.15862923365949
* MAE = 0.7337276122977342
```

---



---

- Time interval n.0: [386.64, 386.84]
  - \* y\_true: [28.15052447 34.1607672 ]
  - \* v\_ann: [34.683013916015625, 34.927330017089844, 39.346032634271026]
  
- Time interval n.1: [386.84, 387.04]
  - \* y\_true: [34.00091123 38.91120777]
  - \* v\_ann: [33.660064697265625, 33.14164733886719, 39.346032634271026]
  
- Time interval n.2: [387.04, 387.24]
  - \* y\_true: [32.52639997 34.00151192]
  - \* v\_ann: [33.997947692871094, 35.170223236083984, 39.346032634271026]
  
- Time interval n.3: [387.24, 387.44]
  - \* y\_true: [32.52639997 39.36234046]
  - \* v\_ann: [33.5421142578125, 34.23115158081055, 39.346032634271026]

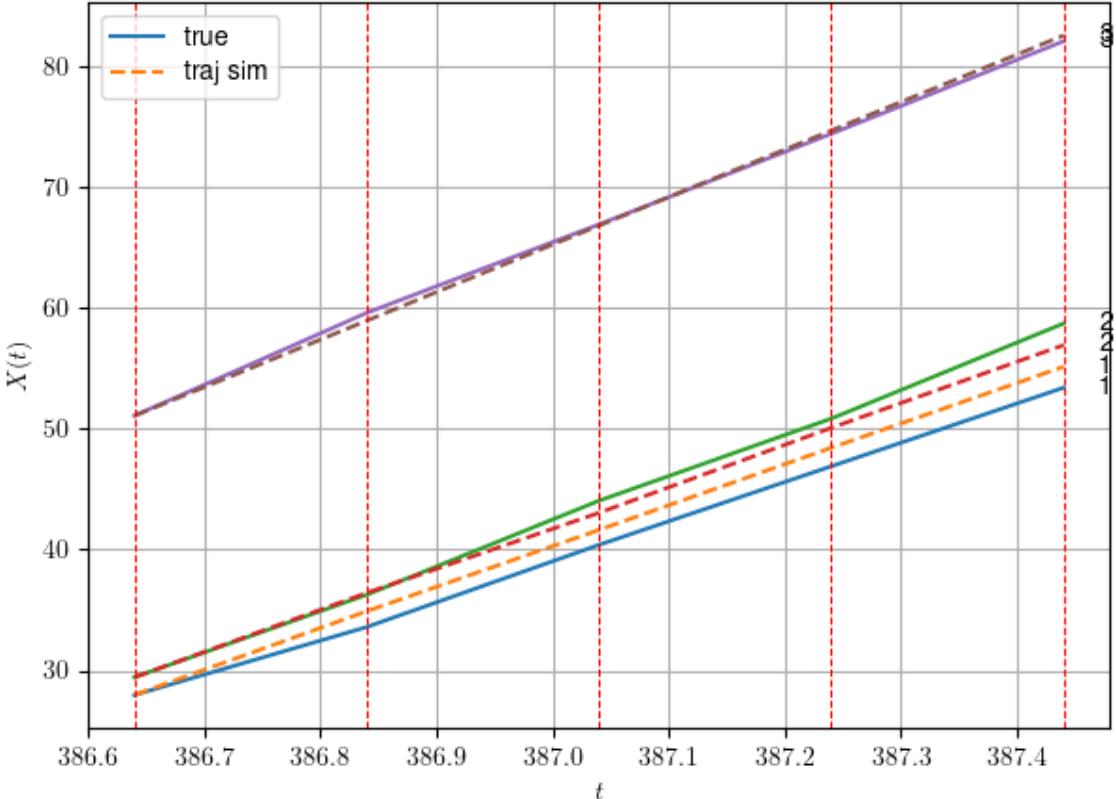
46032634271026]

```

* err= 0.9437985845750697
* Learning rate NN = 0.000239148415857926
* diff = 0.0004932092733656024

```

*df n. 1 – Scene n. 17, at it = 350*



For scene 17/28

```

* use LR_NN=0.0005 with err=49.311684309744244 at it=19
* v0_scn_mean = 38.545011882420255
* MAE = 0.8045008548785217

```

16102804929]

```

- Time interval n.0: [431.84, 432.04]
  * y_true: [30.8908033 31.49166882]
  * v_ann: [32.25104904174805, 32.28857421875, 30.084

```

8416102804929]

```

- Time interval n.1: [432.04, 432.24]
  * y_true: [39.73151551 26.376716 ]
  * v_ann: [32.0391845703125, 31.90165901184082, 30.0

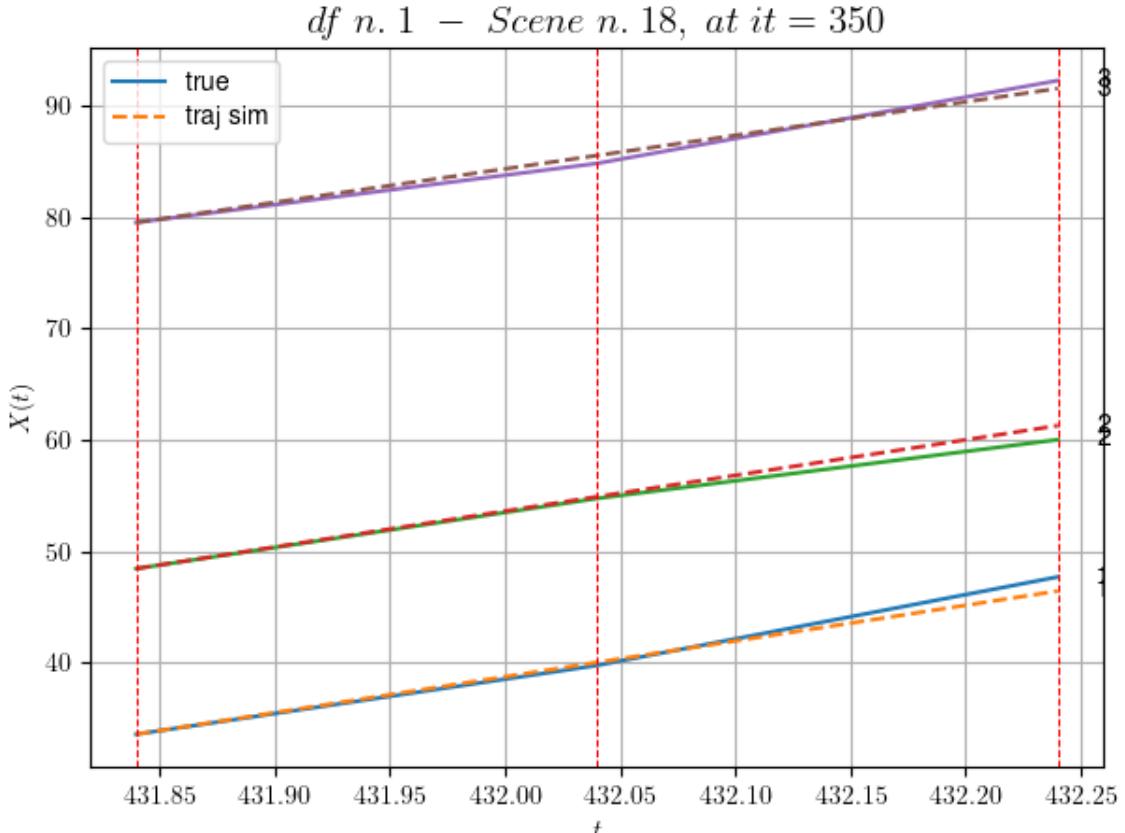
```

8416102804929]

```

* err= 0.4792579445341101
* Learning rate NN = 3.6449993785936385e-05
* diff = 3.557693971290021e-05

```



For scene 18/28

```
* use LR_NN=5e-05 with err=7.294260989264124 at it=19
* v0_scn_mean = 30.076947835821176
* MAE = 0.4792579445341101
```

---



---

```
- Time interval n.0: [446.24, 446.44]
* y_true: [25.89017971 23.30046083]
* v_ann: [26.36172866821289, 25.67398452758789, 29.
5544324287454]
```

---

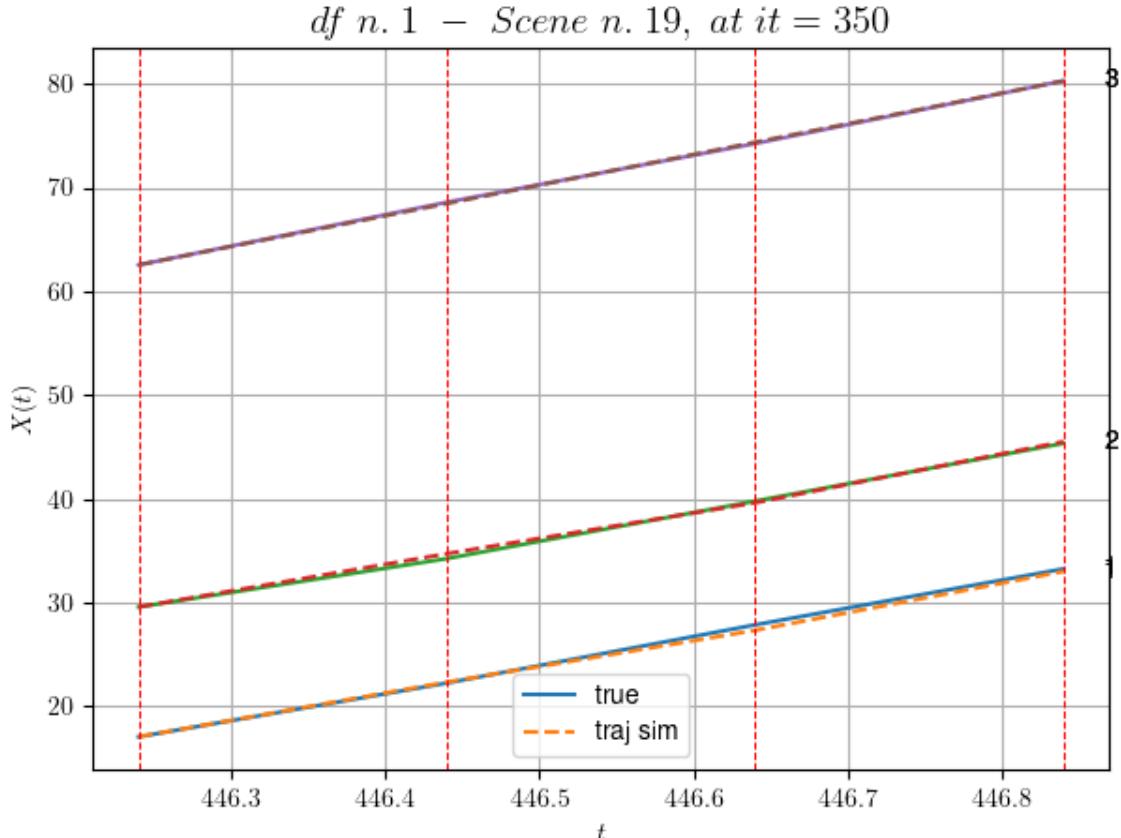
```
- Time interval n.1: [446.44, 446.64]
* y_true: [28.05031625 27.72075411]
* v_ann: [24.926979064941406, 24.520484924316406, 2
9.5544324287454]
```

---

```
- Time interval n.2: [446.64, 446.84]
* y_true: [26.94045507 27.8009832 ]
* v_ann: [28.352447509765625, 29.46428871154785, 2
9.5544324287454]
```

---

```
* err= 0.05551843389284584
* Learning rate NN = 0.0005904899444431067
* diff = 2.9042625005491762e-05
```



For scene 19/28

```
* use LR_NN=0.001 with err=12.028070542532028 at it=19
* v0_scn_mean = 29.592620704444446
* MAE = 0.05551843389284584
```

---



---

```
- Time interval n.0: [447.44, 447.64]
* y_true: [31.0713577 29.31148494]
* v_ann: [27.04413414001465, 26.756553649902344, 3
2.58484136741256]
```

---

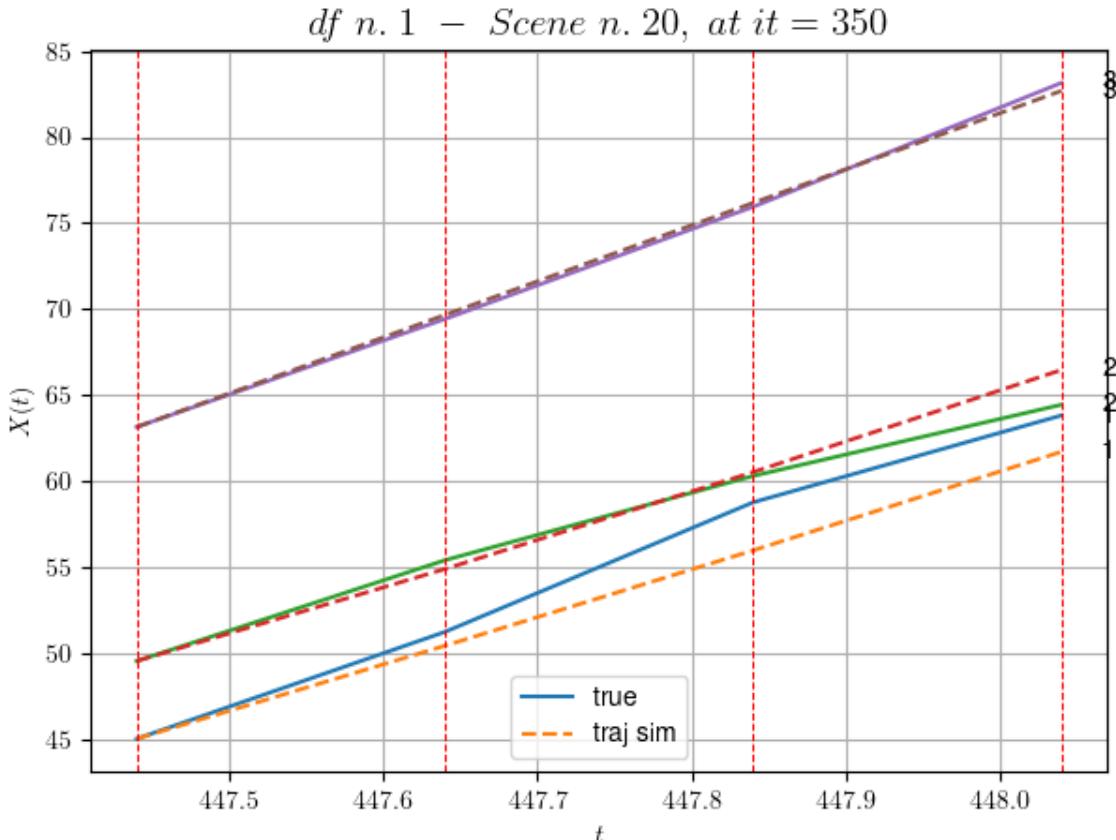
```
- Time interval n.1: [447.64, 447.84]
* y_true: [37.68225285 24.50151408]
* v_ann: [27.728750228881836, 28.16815185546875, 3
2.58484136741256]
```

---

```
- Time interval n.2: [447.84, 448.04]
* y_true: [25.261801 20.71149408]
* v_ann: [28.679309844970703, 29.706783294677734, 3
2.58484136741256]
```

---

```
* err= 1.4707397279330985
* Learning rate NN = 0.0002952449722215533
* diff = 0.0010289911040486377
```



For scene 20/28

```
* use LR_NN=0.0005 with err=24.421383893219424 at it=19
* v0_scn_mean = 32.36330227627505
* MAE = 0.9850164875481257
```

---



---

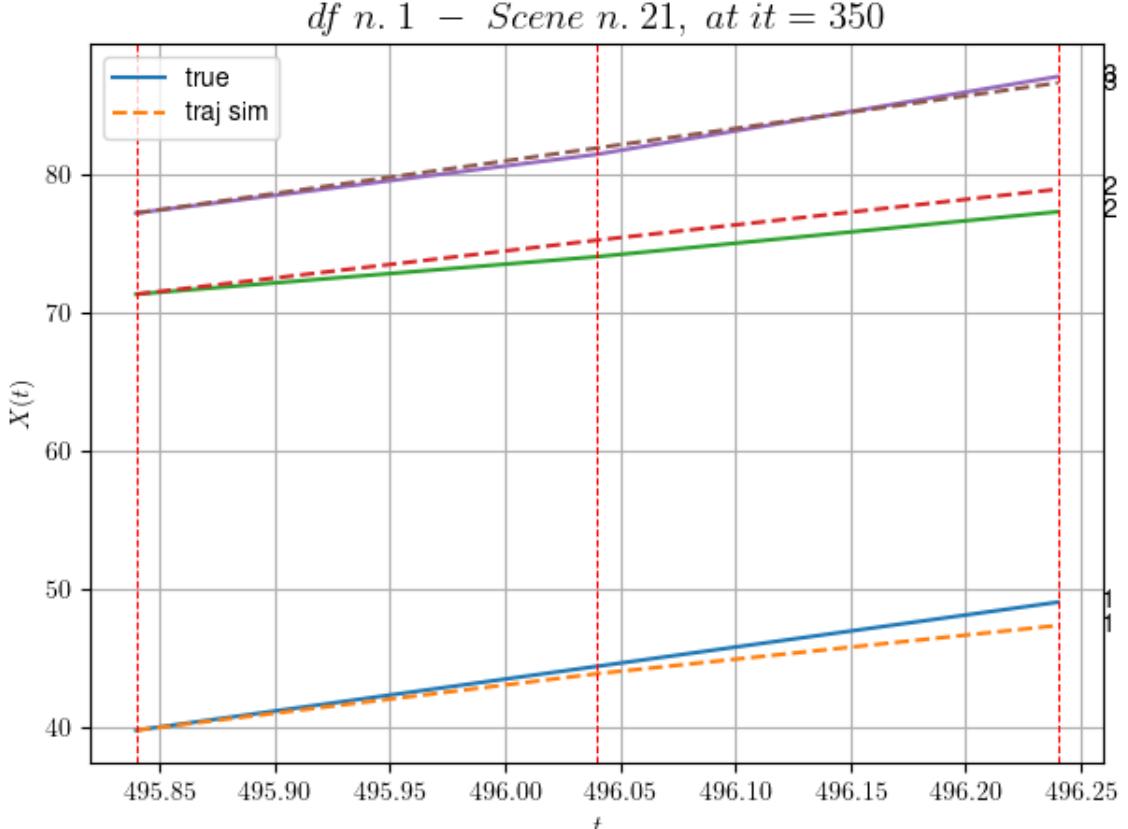
```
- Time interval n.0: [495.84, 496.04]
* y_true: [23.1307843 13.57637571]
* v_ann: [20.477739334106445, 19.550764083862305, 2
3.563140002878278]
```

---

```
- Time interval n.1: [496.04, 496.24]
* y_true: [23.23098731 16.2618474 ]
* v_ann: [17.447237014770508, 18.443897247314453, 2
3.563140002878278]
```

---

```
* err= 0.8487848104786235
* Learning rate NN = 0.0007289999630302191
* diff = 8.075719532918413e-05
```



For scene 21/28

```
* use LR_NN=0.001 with err=2.7553293827724716 at it=19
* v0_scn_mean = 24.11482419190473
* MAE = 0.8406019570020223
```

---



---

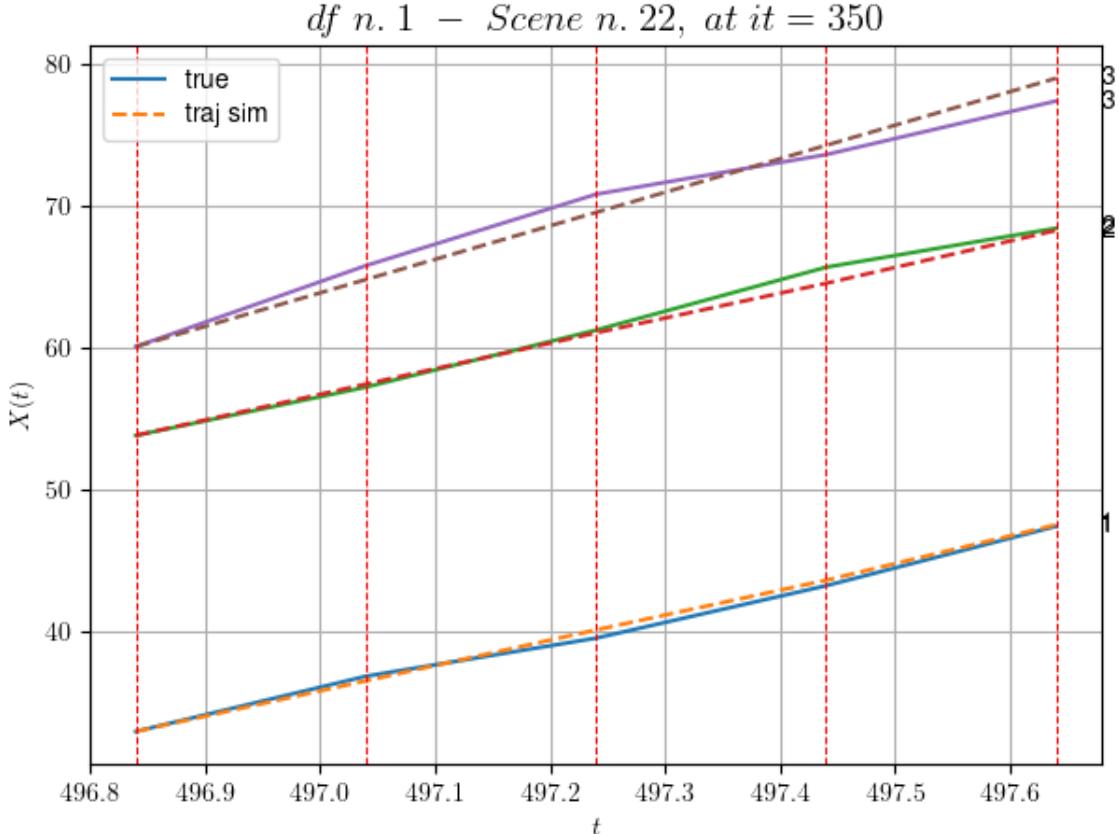
- Time interval n.0: [496.84, 497.04]
  - \* y\_true: [19.47545433 17.05100655]
  - \* v\_ann: [17.864837646484375, 18.11942481994629, 2
  - 3.67106786224961]
  
- Time interval n.1: [497.04, 497.24]
  - \* y\_true: [13.44536038 20.12642582]
  - \* v\_ann: [17.944778442382812, 18.062889099121094, 2
  - 3.67106786224961]
  
- Time interval n.2: [497.24, 497.44]
  - \* y\_true: [18.49565962 22.17670532]
  - \* v\_ann: [17.5425968170166, 17.509326934814453, 23.
  - 67106786224961]
  
- Time interval n.3: [497.44, 497.64]
  - \* y\_true: [20.96085077 13.7761341 ]
  - \* v\_ann: [19.56338119506836, 18.6689510345459, 23.6

7106786224961]

```

* err= 0.5065024376786814
* Learning rate NN = 0.000478296831715852
* diff = 9.87940934403797e-05

```



For scene 22/28

```

* use LR_NN=0.001 with err=13.635904152358913 at it=19
* v0_scn_mean = 24.213501874389145
* MAE = 0.5058327111938151

```

---



---

```

- Time interval n.0: [499.04, 499.24]
  * y_true: [23.84103851 15.32650765]
  * v_ann: [21.69794273376465, 21.542282104492188, 1
7.83225143987409]

```

---



---

```

- Time interval n.1: [499.24, 499.44]
  * y_true: [26.92142921 19.88726092]
  * v_ann: [21.281108856201172, 21.38272476196289, 1
7.83225143987409]

```

---

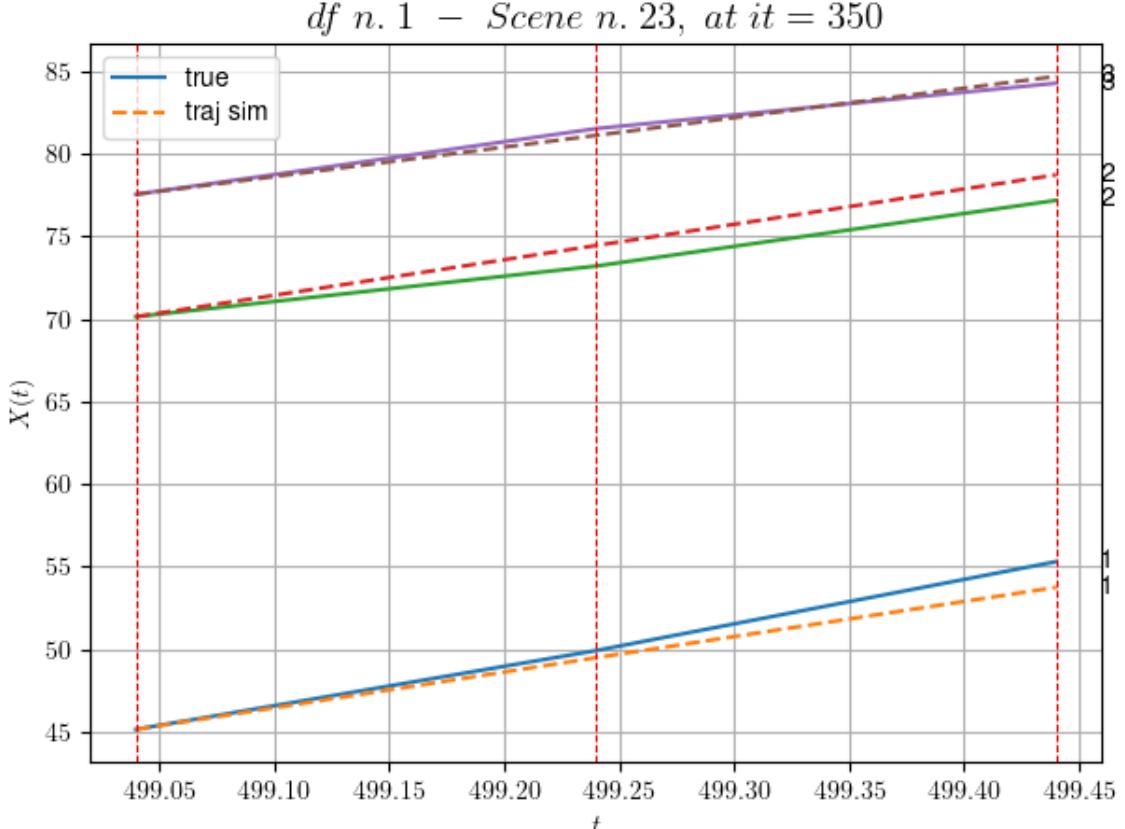


---

```

* err= 0.7626593947131085
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0009646346345650869

```



For scene 23/28

\* use LR\_NN=0.0001 with err=5.151124679790102 at it=19  
 \* v0\_scn\_mean = 18.875113099080316  
 \* MAE = 0.6504461329889398

---



---

For scene 24/28

\* use LR\_NN=0.0001 with err=10.452493680934827 at it=19  
 \* v0\_scn\_mean = 14.477563694580484  
 \* MAE = 0.027173220324467274

---



---

- Time interval n.0: [502.24, 502.44]  
 \* y\_true: [20.97545504 14.04040867]  
 \* v\_ann: [16.670854568481445, 17.575937271118164, 1  
 5.581120912086643]

---

- Time interval n.1: [502.44, 502.64]  
 \* y\_true: [18.07559412 14.7904947 ]  
 \* v\_ann: [16.987184524536133, 17.682100296020508, 1  
 5.581120912086643]

---

- Time interval n.2: [502.64, 502.84]

```

* y_true: [18.07559412 14.18054394]
* v_ann: [17.14621353149414, 17.22215461730957, 15.
581120912086643]

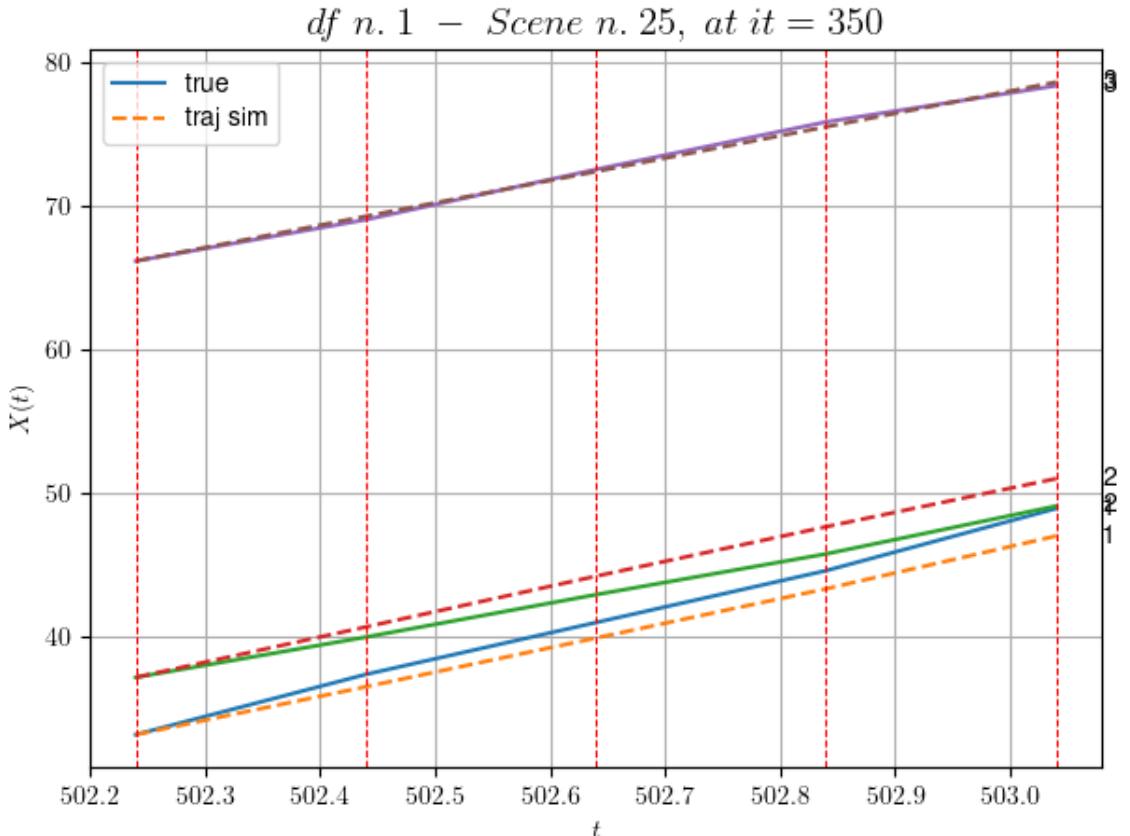
-----
- Time interval n.3: [502.84, 503.04]
* y_true: [21.64181695 16.68485314]
* v_ann: [18.39243507385254, 16.764116287231445, 1
5.581120912086643]

```

```

* err= 1.1209702091180083
* Learning rate NN = 0.000478296831715852
* diff = 4.0274242823379325e-05

```



For scene 25/28

```

* use LR_NN=0.001 with err=36.628784137348646 at it=19
* v0_scn_mean = 16.816920295613517
* MAE = 1.1209702091180083
=====
```

```

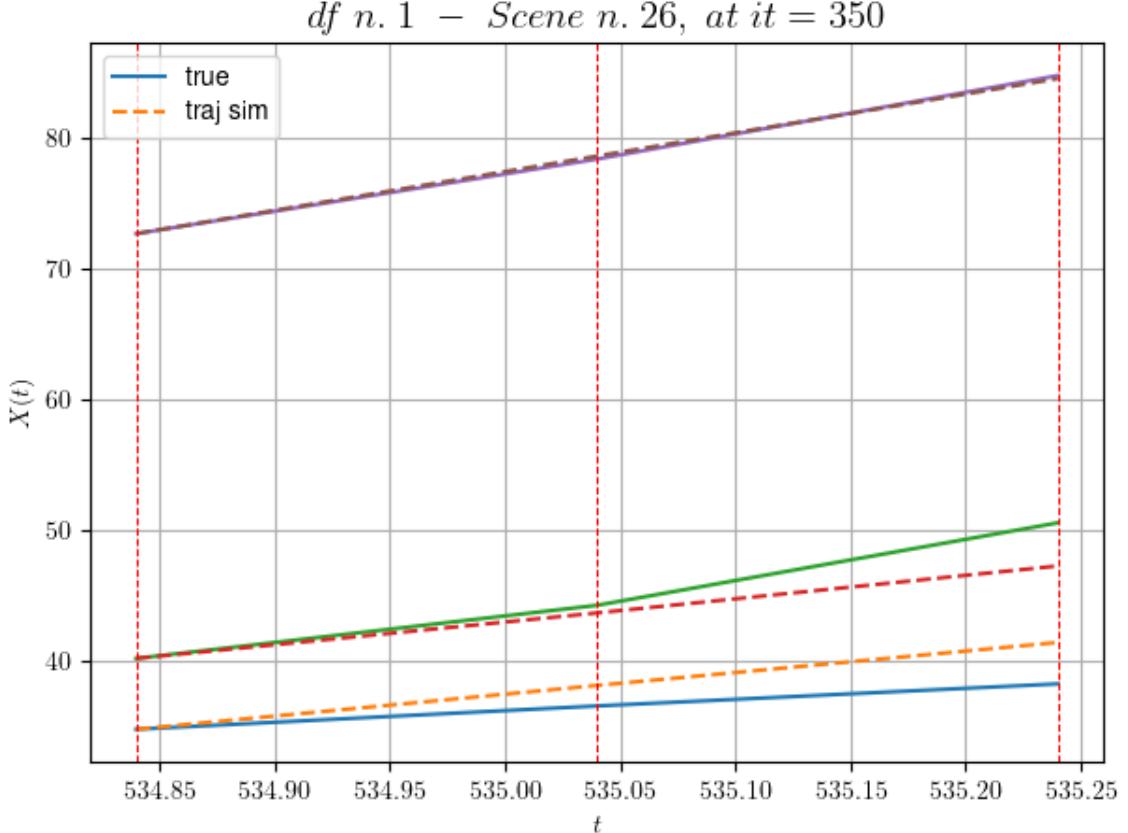
- Time interval n.0: [534.84, 535.04]
* y_true: [ 8.93323515 20.37071651]
* v_ann: [16.80109214782715, 17.45479965209961, 29.
753484139131494]
```

```

- Time interval n.1: [535.04, 535.24]
```

```
* y_true: [ 8.47527286 31.64140498]
* v_ann: [16.493385314941406, 18.016971588134766, 2
9.753484139131494]
```

```
-----  
-----  
* err= 2.6622197260772587  
* Learning rate NN = 7.289998848136747e-06  
* diff = 0.005403501422011005
```



For scene 26/28

```
* use LR_NN=1e-05 with err=1.2170549619136424 at it=19
* v0_scn_mean = 29.774612282797335
* MAE = 2.097396664442259
```

```
=====  
=====  
- Time interval n.0: [573.84, 574.04]  
* y_true: [20.07571717 13.74586409]  
* v_ann: [13.681988716125488, 14.243513107299805,  
9.3388689558502]
```

```
-----  
-----  
- Time interval n.1: [574.04, 574.24]  
* y_true: [13.45064024 11.92582032]  
* v_ann: [13.99129581451416, 14.060551643371582, 9.  
3388689558502]
```

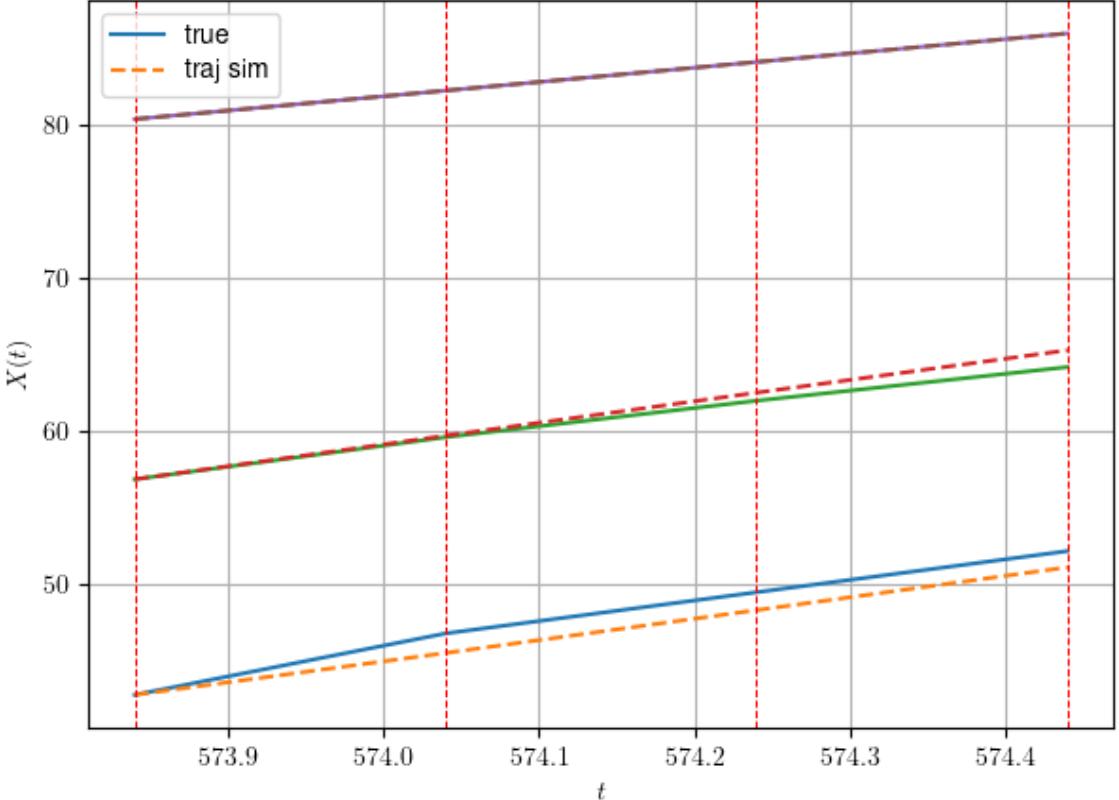
```
-----  
-----  
- Time interval n.2: [574.24, 574.44]  
* y_true: [13.45064024 11.00083908]
```

```
* v_ann: [14.012529373168945, 13.865221977233887,
9.3388689558502]
```

---

```
* err= 0.4684211270625205
* Learning rate NN = 2.952449540316593e-05
* diff = 0.0006230010276033204
```

*df n. 1 – Scene n. 27, at it = 350*



For scene 27/28

```
* use LR_NN=5e-05 with err=22.446657274570672 at it=19
* v0_scn_mean = 11.109673250112769
* MAE = 0.40715607266308257
```

---



---

For df=1 with 28 scenes, time taken: 256.69

---



---



---



---

```
*****
*****
```

In df n.2/10 we have 18 scenes

```
*****
*****
```

- Time interval n.0: [86.16, 86.36]
  - \* y\_true: [16.74023073 23.1409288 ]
  - \* v\_ann: [18.414236068725586, 18.414207458496094, 1
6.235429521340045]

```

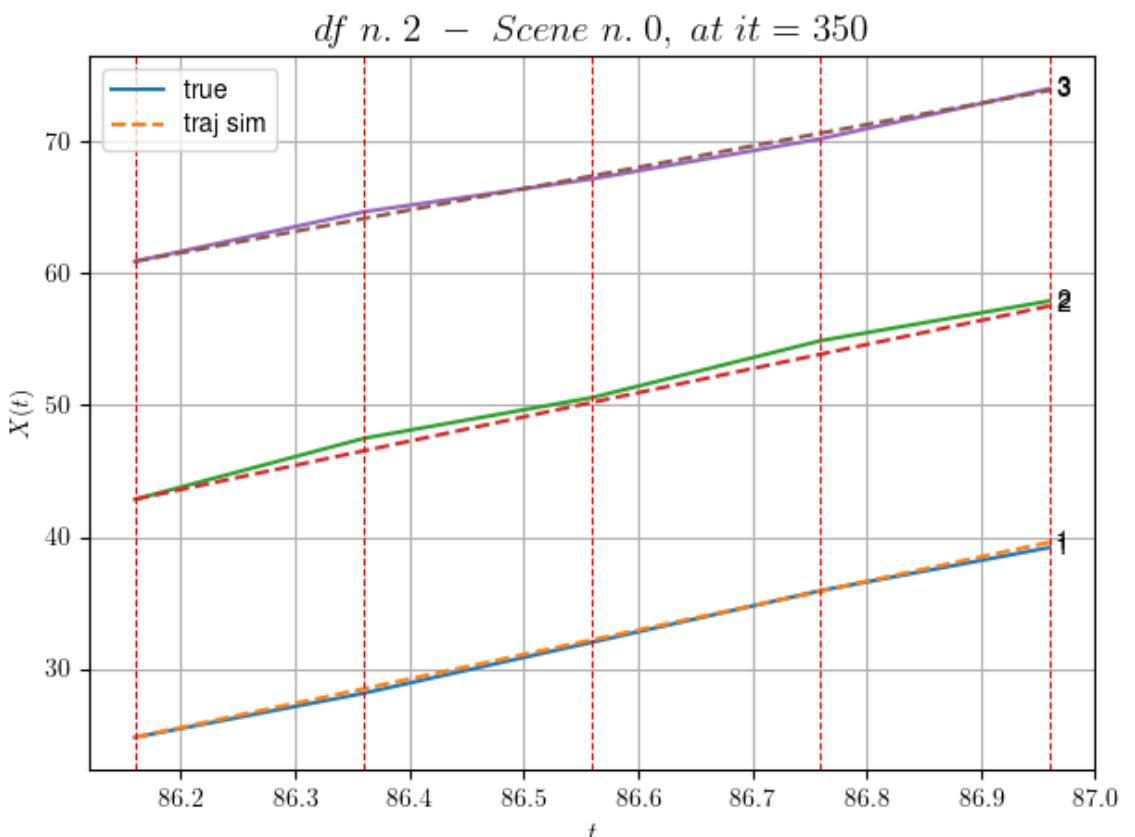
    - Time interval n.1: [86.36, 86.56]
      * y_true: [19.40034801 15.51071286]
      * v_ann: [18.60247802734375, 18.402667999267578, 1
6.235429521340045]

-----
    - Time interval n.2: [86.56, 86.76]
      * y_true: [19.59044325 21.61118084]
      * v_ann: [18.479238510131836, 18.31380844116211, 1
6.235429521340045]

-----
    - Time interval n.3: [86.76, 86.96]
      * y_true: [16.37044892 15.10091945]
      * v_ann: [18.60983657836914, 18.29983139038086, 16.
235429521340045]

-----
```

\* err= 0.2038977739830816  
\* Learning rate NN = 2.3914839403005317e-05  
\* diff = 1.2739249396681585e-05



For scene 0/18

\* use LR\_NN=5e-05 with err=15.81935885936477 at it=19  
\* v0\_scn\_mean = 17.41515005358985  
\* MAE = 0.2038801199675305

```

- Time interval n.0: [109.36, 109.56]
  * y_true: [28.77160952 15.03115545]
  * v_ann: [22.340652465820312, 22.771595001220703, 2
0.033930717995407]

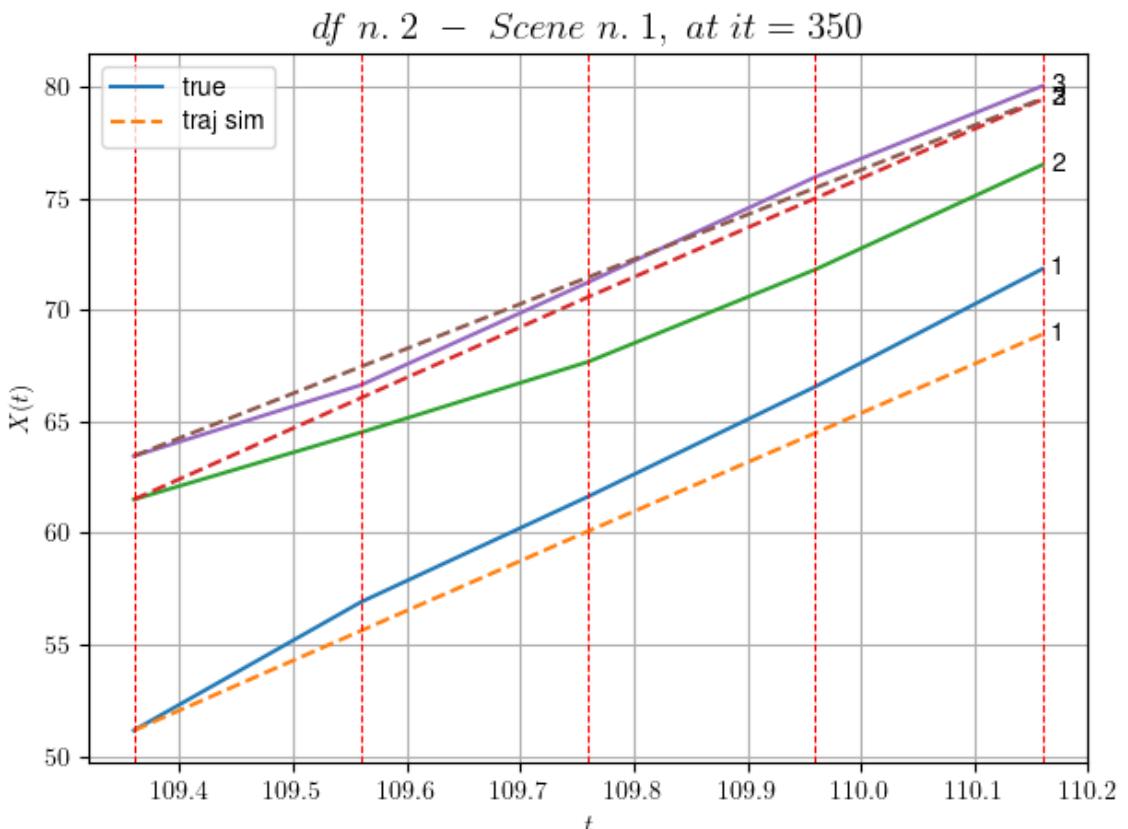
-----
- Time interval n.1: [109.56, 109.76]
  * y_true: [23.64157457 15.83133823]
  * v_ann: [22.307891845703125, 22.618314743041992, 2
0.033930717995407]

-----
- Time interval n.2: [109.76, 109.96]
  * y_true: [24.63196009 20.68195399]
  * v_ann: [22.006641387939453, 22.12303352355957, 2
0.033930717995407]

-----
- Time interval n.3: [109.96, 110.16]
  * y_true: [26.38241903 23.49250056]
  * v_ann: [22.113489151000977, 22.15955924987793, 2
0.033930717995407]

* err= 3.1912759513221225
* Learning rate NN = 0.000239148415857926
* diff = 0.0011991281380656638

```



For scene 1/18

```

* use LR_NN=0.0005 with err=11.30848536494569 at it=19
* v0_scn_mean = 20.888092972897137

```

\* MAE = 3.1912759513221225

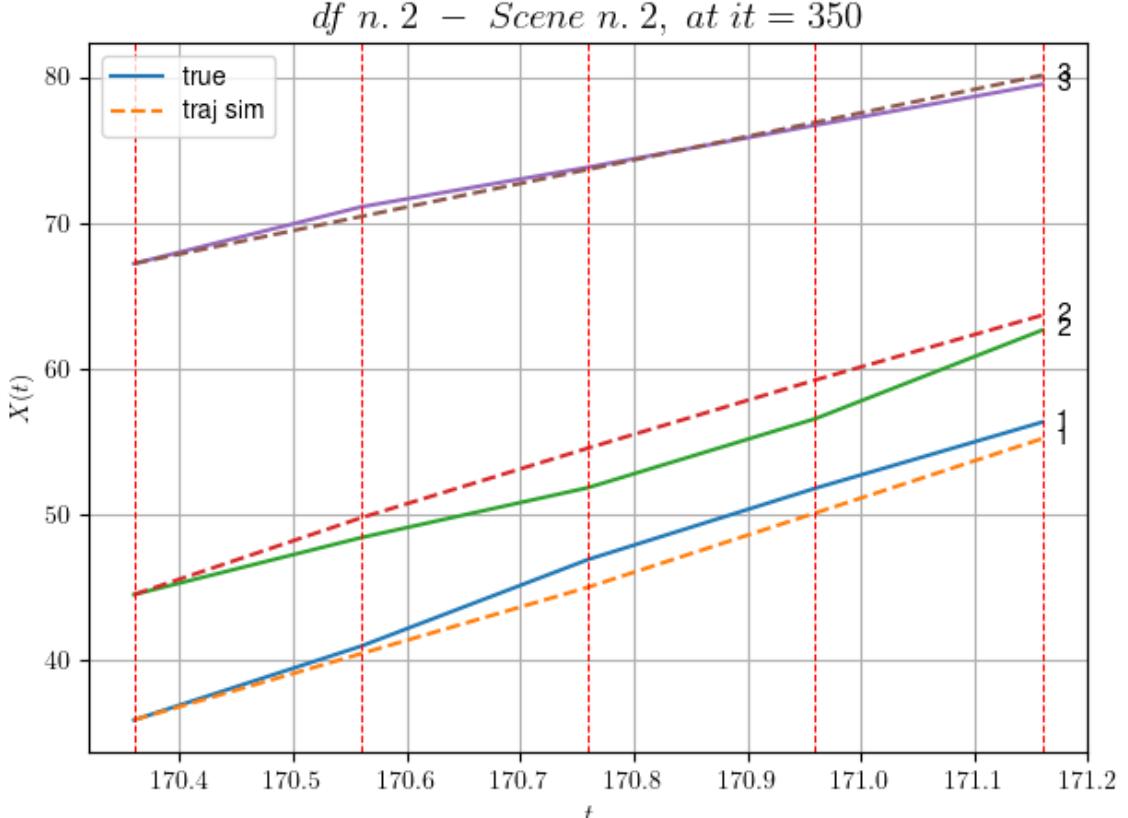
```
=====
=====
- Time interval n.0: [170.36, 170.56]
* y_true: [25.3307413 19.52081588]
* v_ann: [22.760536193847656, 26.321142196655273, 1
6.15170945762333]

-----
-----
- Time interval n.1: [170.56, 170.76]
* y_true: [29.74113537 17.1608437 ]
* v_ann: [22.809438705444336, 23.931350708007812, 1
6.15170945762333]

-----
-----
- Time interval n.2: [170.76, 170.96]
* y_true: [24.43113316 23.6413756 ]
* v_ann: [25.437456130981445, 23.345020294189453, 1
6.15170945762333]

-----
-----
- Time interval n.3: [170.96, 171.16]
* y_true: [22.71130298 30.41206279]
* v_ann: [25.53358268737793, 22.239669799804688, 1
6.15170945762333]

-----
-----
* err= 1.748648220691912
* Learning rate NN = 0.000478296831715852
* diff = 0.00043603185624463414
```



For scene 2/18

\* use LR\_NN=0.001 with err=39.50598421339057 at it=19

\* v0\_scn\_mean = 17.338605388356036

\* MAE = 1.748648220691912

- 
- 
- Time interval n.0: [179.36, 179.56]
    - \* y\_true: [10.36002857 23.43048282]
    - \* v\_ann: [15.174501419067383, 18.487085342407227, 2.08205674402131]
- 
- 
- Time interval n.1: [179.56, 179.76]
    - \* y\_true: [10.37004005 22.87060641]
    - \* v\_ann: [15.891209602355957, 18.160430908203125, 2.08205674402131]
- 
- 
- Time interval n.2: [179.76, 179.96]
    - \* y\_true: [15.39008451 20.81068862]
    - \* v\_ann: [16.537031173706055, 18.161705017089844, 2.08205674402131]
- 
- 
- Time interval n.3: [179.96, 180.16]
    - \* y\_true: [12.44008929 23.53096892]
    - \* v\_ann: [16.933198928833008, 18.623273849487305, 2.08205674402131]

2.08205674402131]

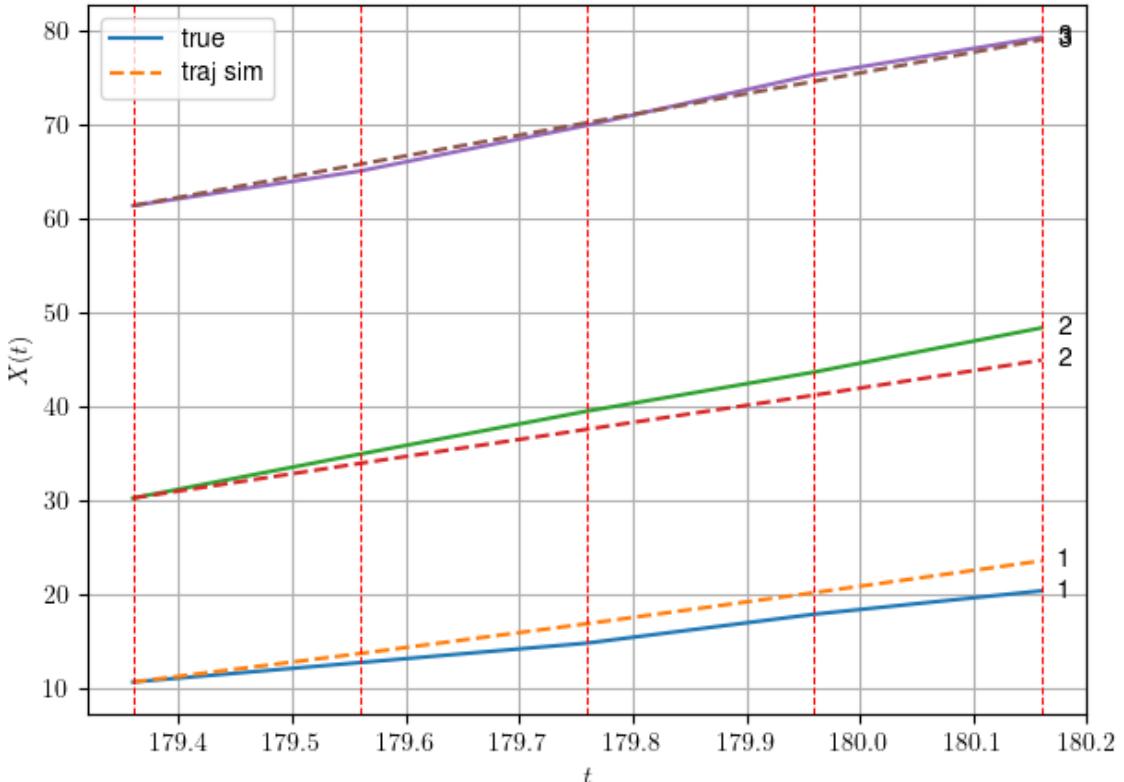
---



---

```
* err= 2.965928415972503
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.005632260642068257
```

*df n. 2 – Scene n. 3, at it = 350*



For scene 3/18

```
* use LR_NN=0.0001 with err=5.853135224848707 at it=19
* v0_scn_mean = 22.760680188664754
* MAE = 2.7267232836916704
```

---



---

For scene 4/18

```
* use LR_NN=0.001 with err=10.178737750125755 at it=19
* v0_scn_mean = 16.422367386116626
* MAE = 0.005498948918908967
```

---



---

- Time interval n.0: [212.56, 212.76]
  - \* y\_true: [14.43013055 12.85042103]
  - \* v\_ann: [14.560511589050293, 17.67108726501465, 2 0.507203914762993]

---



---

- Time interval n.1: [212.76, 212.96]
  - \* y\_true: [10.79011916 33.80137312]

```
* v_ann: [14.351775169372559, 18.518001556396484, 2
0.507203914762993]
```

---

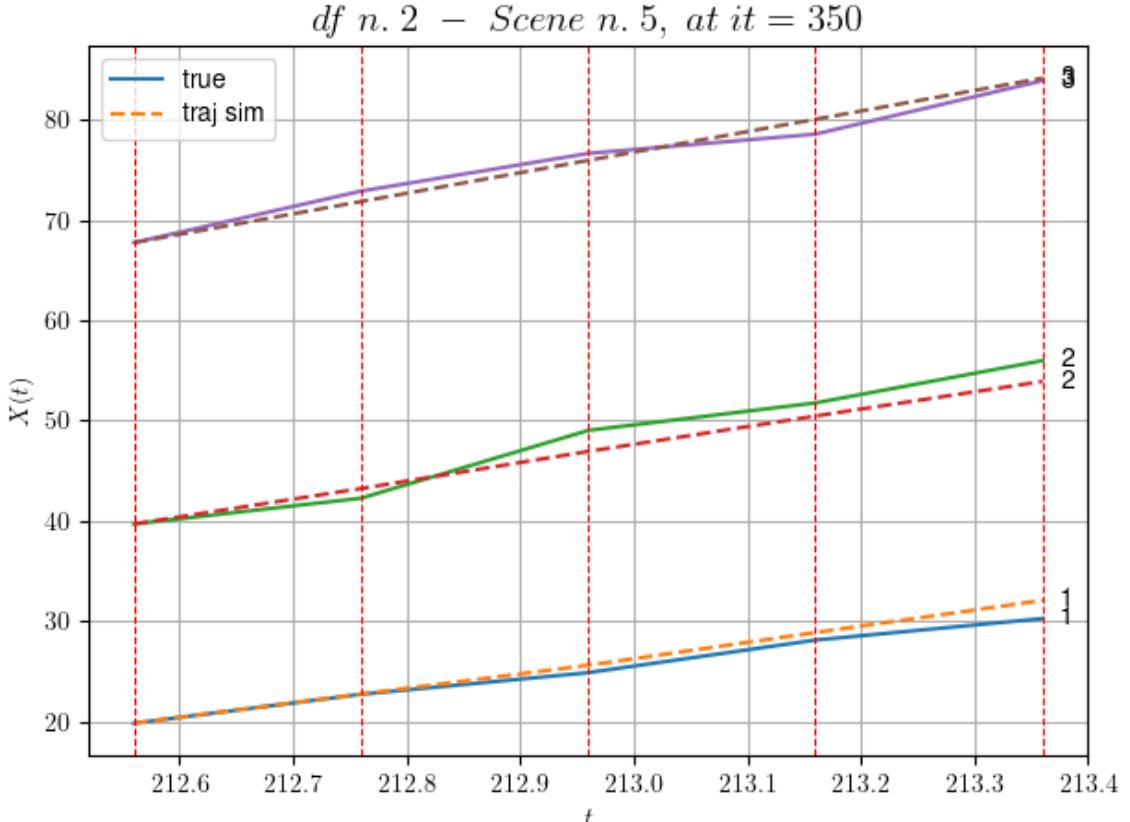
```
- Time interval n.2: [212.96, 213.16]
* y_true: [16.24022861 13.70067627]
* v_ann: [16.30657196044922, 17.638715744018555, 2
0.507203914762993]
```

---

```
- Time interval n.3: [213.16, 213.36]
* y_true: [10.73017559 21.10118973]
* v_ann: [16.02690887451172, 17.229557037353516, 2
0.507203914762993]
```

---

```
* err= 1.3037635084044272
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.0011106188028464636
```



For scene 5/18

```
* use LR_NN=5e-05 with err=8.83132563470521 at it=19
* v0_scn_mean = 21.320803326933294
* MAE = 1.2849118431528437
```

---



---

```
- Time interval n.0: [318.16, 318.36]
* y_true: [13.01007537 20.36054455]
* v_ann: [14.674943923950195, 18.197132110595703, 2
```

0.35526732088682]

---

- Time interval n.1: [318.36, 318.56]
  - \* y\_true: [14.27010639 20.89068863]
  - \* v\_ann: [15.178363800048828, 18.37958335876465, 2

0.35526732088682]

---

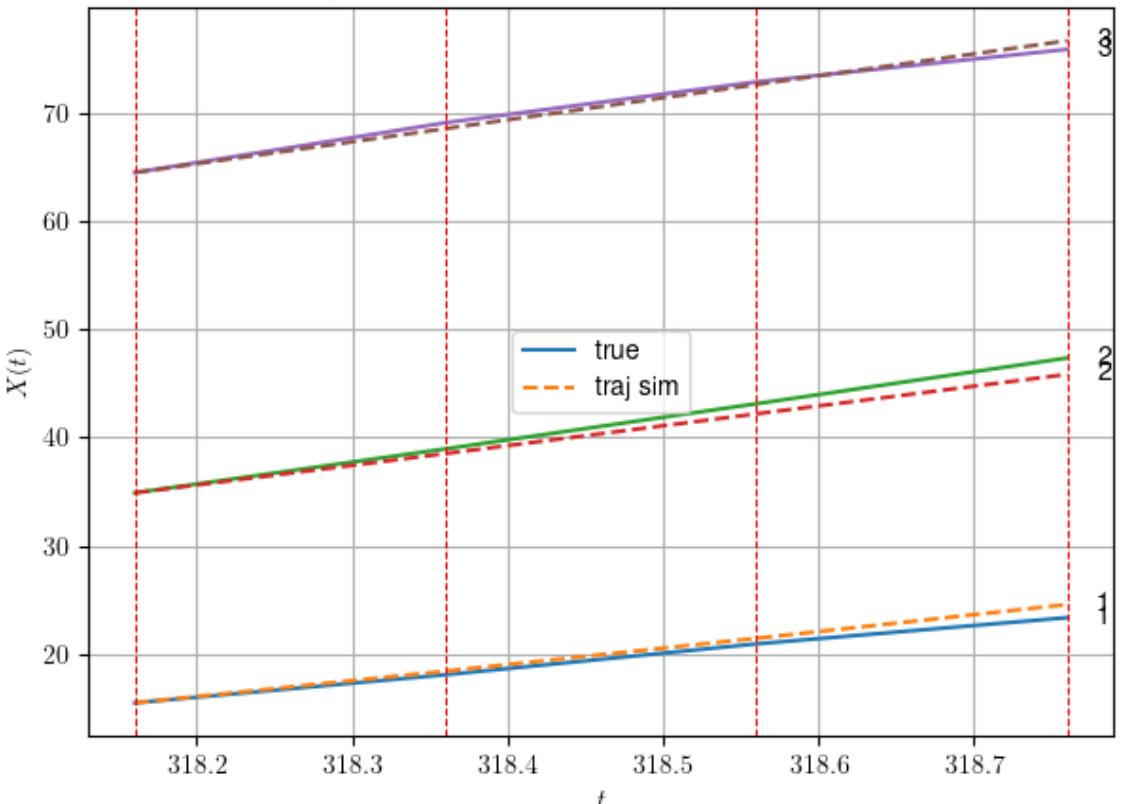
- Time interval n.2: [318.56, 318.76]
  - \* y\_true: [12.16011799 21.20084683]
  - \* v\_ann: [15.663729667663574, 18.281288146972656, 2

0.35526732088682]

---

- \* err= 0.5193072684557176
- \* Learning rate NN = 2.952449540316593e-05
- \* diff = 0.0013032103427897956

*df n. 2 – Scene n. 6, at it = 350*



For scene 6/18

- \* use LR\_NN=5e-05 with err=4.9587346471989955 at it=19
- \* v0\_scn\_mean = 21.181888768119666
- \* MAE = 0.4892757918947916

---



---

- Time interval n.0: [430.16, 430.36]
  - \* y\_true: [15.83005748 20.27065425]
  - \* v\_ann: [18.770217895507812, 18.440711975097656, 2

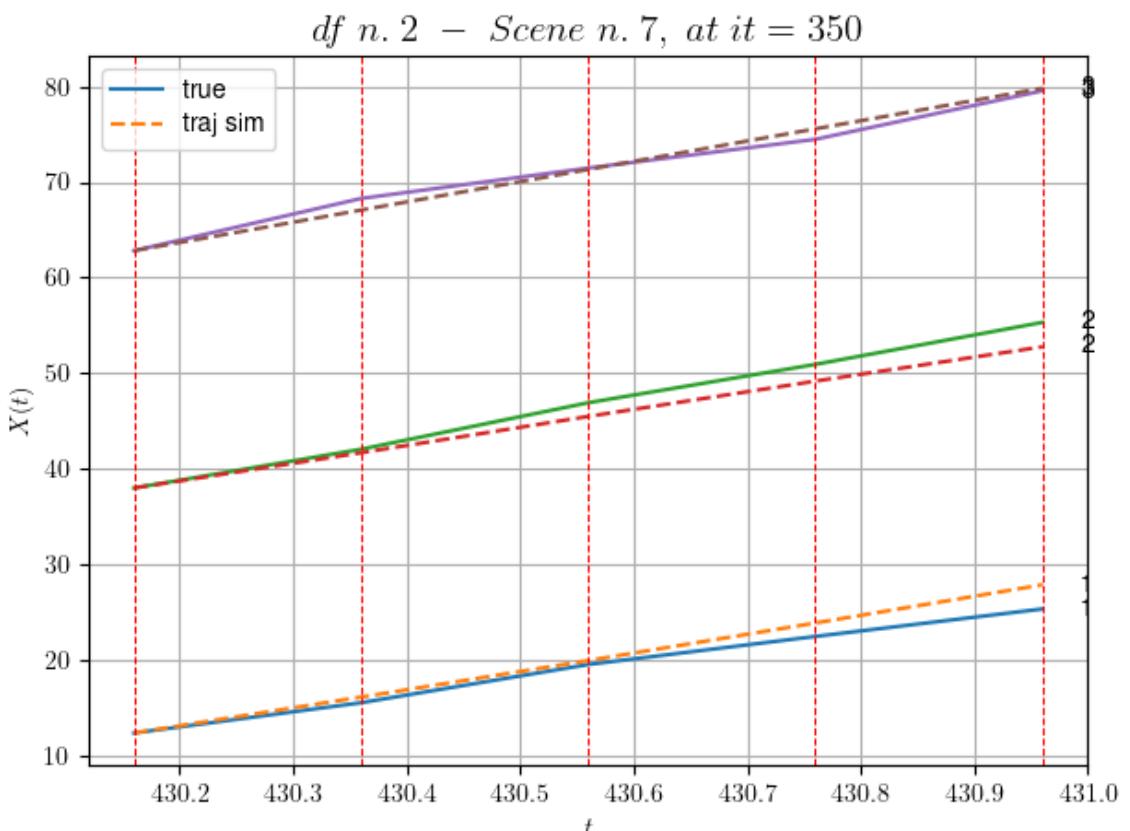
```
1.236966061390955]
```

```
- Time interval n.1: [430.36, 430.56]
  * y_true: [19.99011659 24.33092793]
  * v_ann: [19.10576629638672, 18.989953994750977, 2
1.236966061390955]
```

```
- Time interval n.2: [430.56, 430.76]
  * y_true: [14.67011767 20.05093433]
  * v_ann: [19.643190383911133, 18.46299171447754, 2
1.236966061390955]
```

```
- Time interval n.3: [430.76, 430.96]
  * y_true: [14.38015429 21.97121967]
  * v_ann: [19.98917579650879, 17.95642852783203, 21.
236966061390955]
```

```
* err= 1.5620664336567234
* Learning rate NN = 2.3914839403005317e-05
* diff = 2.6304112996422546e-05
```



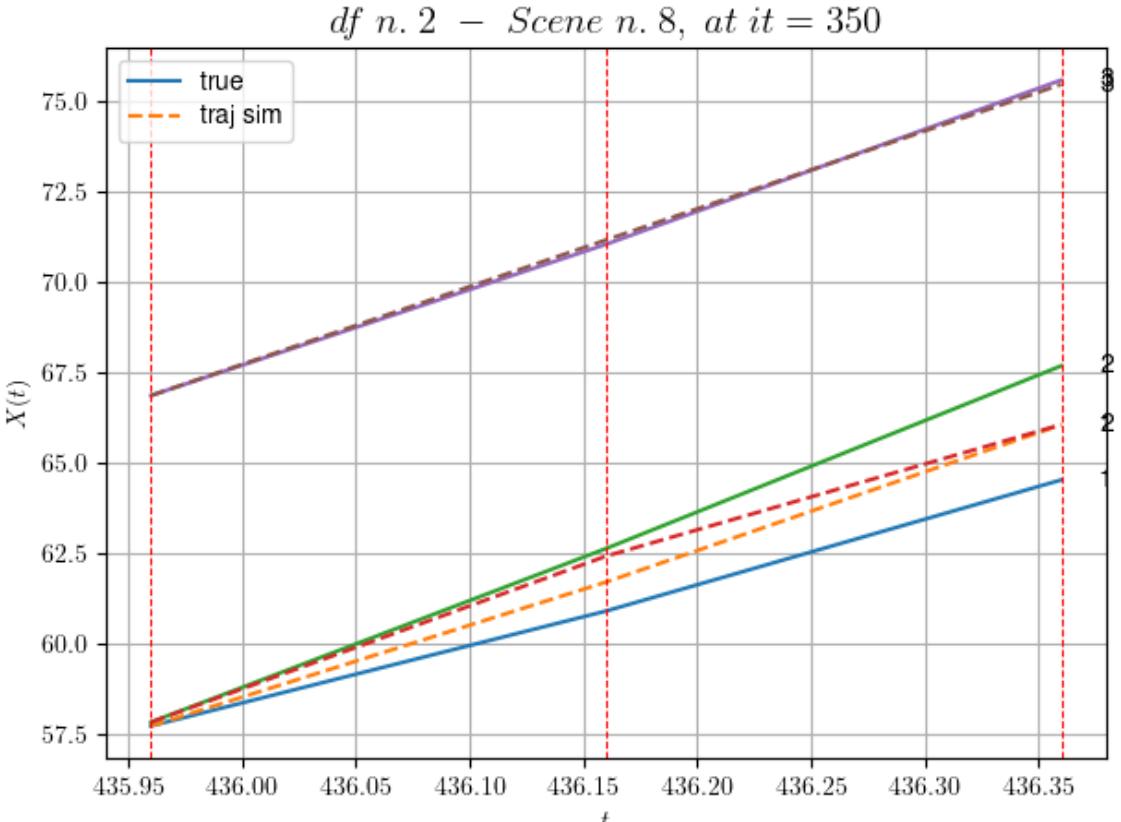
For scene 7/18

```
* use LR_NN=5e-05 with err=8.625481676308079 at it=19
* v0_scn_mean = 21.98801972326914
* MAE = 1.5620664336567234
```

```
=====
=====
- Time interval n.0: [435.96, 436.16]
  * y_true: [15.85107698 23.95169404]
  * v_ann: [19.846843719482422, 22.90180015563965, 2
  1.458777210396583]
```

```
=====
- Time interval n.1: [436.16, 436.36]
  * y_true: [18.0813972 25.19206379]
  * v_ann: [21.694835662841797, 18.1392822265625, 21.
  458777210396583]
```

```
=====
* err= 0.6281514449072642
* Learning rate NN = 0.0036449995823204517
* diff = 0.0005685154437110596
```



For scene 8/18

```
* use LR_NN=0.005 with err=2.4744620696983373 at it=19
* v0_scn_mean = 22.19082009622713
* MAE = 0.6281514449072642
```

```
=====
=====
- Time interval n.0: [442.76, 442.96]
  * y_true: [18.06141662 13.31057742]
  * v_ann: [21.606395721435547, 17.32643699645996, 2
  2.775949002662195]
```

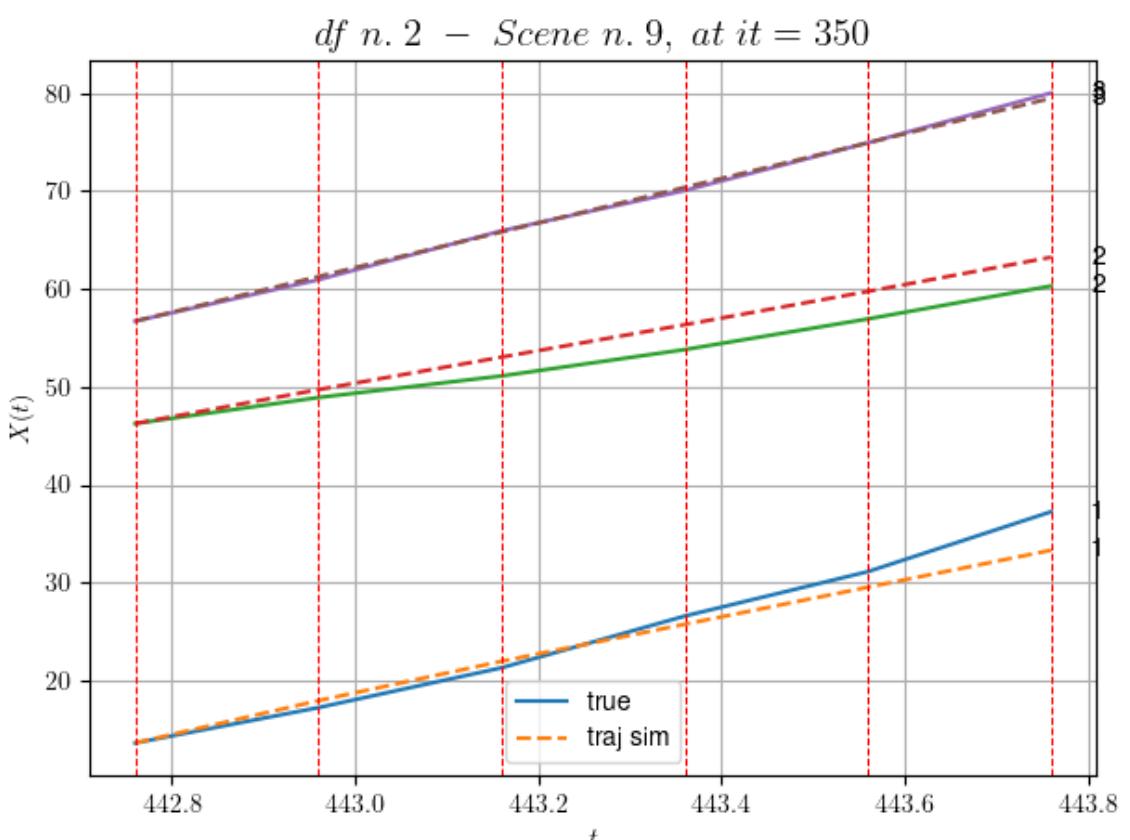
```
- Time interval n.1: [442.96, 443.16]
  * y_true: [20.34015276 11.01053508]
  * v_ann: [20.12200164794922, 16.62427520751953, 22.
  775949002662195]

- Time interval n.2: [443.16, 443.36]
  * y_true: [26.42894929 13.47072378]
  * v_ann: [18.911466598510742, 16.54416847229004, 2
  2.775949002662195]

- Time interval n.3: [443.36, 443.56]
  * y_true: [22.70036274 15.67093348]
  * v_ann: [18.924381256103516, 17.018537521362305, 2
  2.775949002662195]

- Time interval n.4: [443.56, 443.76]
  * y_true: [30.60068675 16.84112333]
  * v_ann: [18.889850616455078, 17.466964721679688, 2
  2.775949002662195]

* err= 2.6394500717902187
* Learning rate NN = 3.874203684972599e-05
* diff = 0.02717353475927453
```



For scene 9/18

- \* use LR\_NN=0.0001 with err=8.211099141580478 at it=19
- \* v0\_scn\_mean = 23.395100998780844
- \* MAE = 1.6367792635110805

---



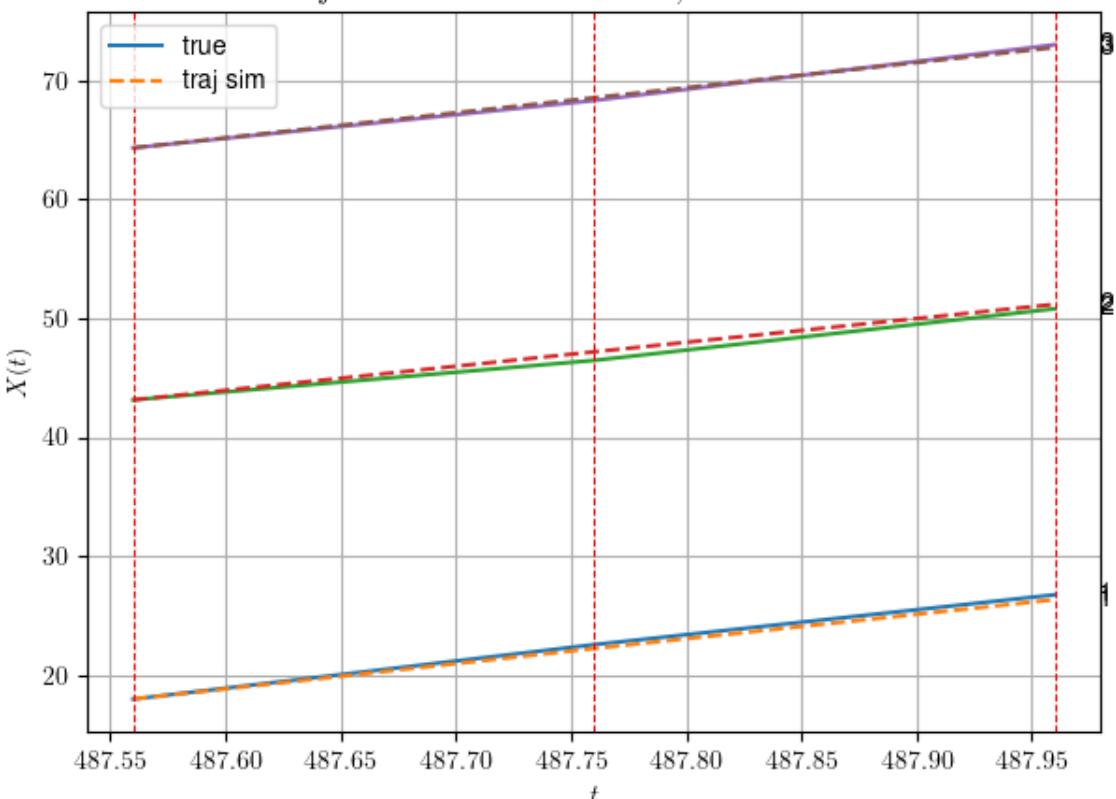
---

- Time interval n.0: [487.56, 487.76]
- \* y\_true: [22.90018755 16.61065196]
- \* v\_ann: [21.3170166015625, 20.219572067260742, 21.11196447190883]

- Time interval n.1: [487.76, 487.96]
- \* y\_true: [21.00025249 21.71102285]
- \* v\_ann: [20.53611946105957, 20.004581451416016, 21.11196447190883]

- \* err= 0.11675830525337709
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 2.4841711262324484e-05

*df n. 2 – Scene n. 10, at it = 350*



For scene 10/18

- \* use LR\_NN=0.0001 with err=1.6982006608689495 at it=19
- \* v0\_scn\_mean = 21.873731649468894
- \* MAE = 0.11562866809336925

---

```
=====
For scene 11/18
* use LR_NN=0.001 with err=44.58464570312751 at it=19
* v0_scn_mean = 19.12051142649833
* MAE = 1.0178198990900658
```

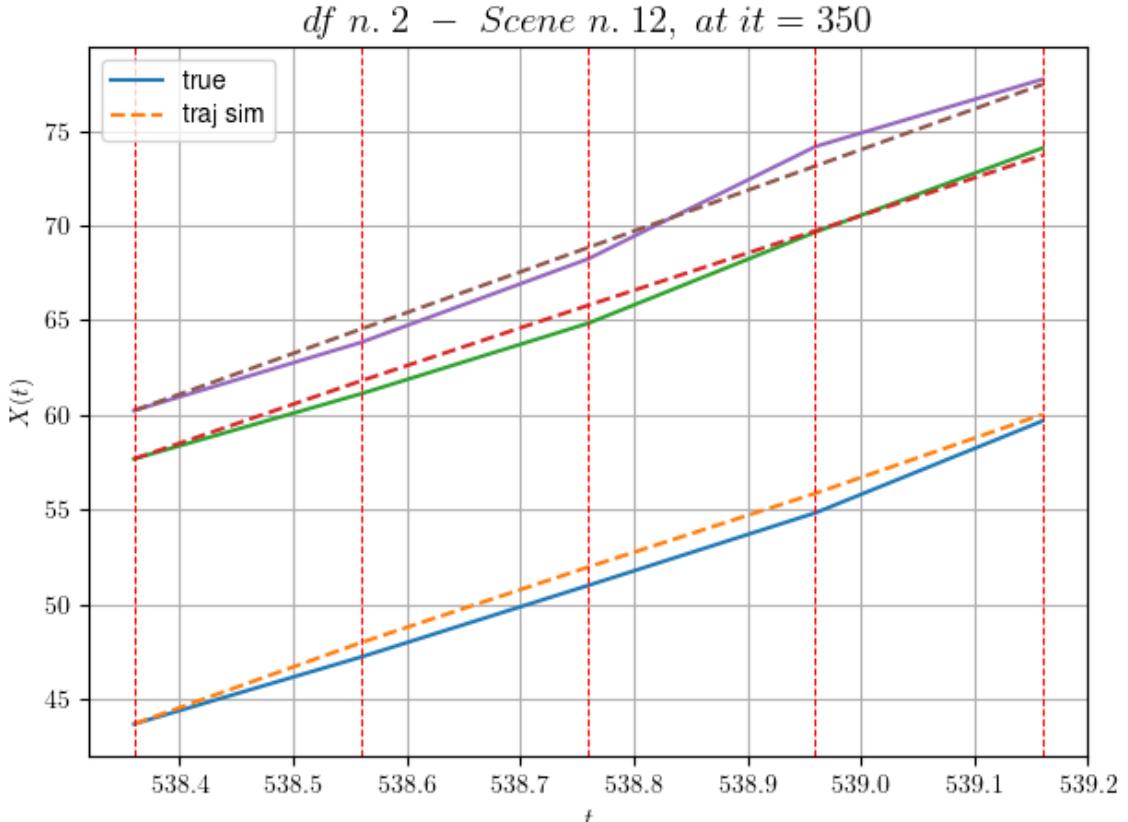
```
=====
=====
- Time interval n.0: [538.36, 538.56]
  * y_true: [17.69068154 17.20117669]
  * v_ann: [21.495433807373047, 20.607528686523438, 2
1.51893062774937]

-----
- Time interval n.1: [538.56, 538.76]
  * y_true: [18.89091077 18.60142936]
  * v_ann: [19.932144165039062, 19.940237045288086, 2
1.51893062774937]

-----
- Time interval n.2: [538.76, 538.96]
  * y_true: [19.15102468 24.05210496]
  * v_ann: [19.461441040039062, 19.65363311767578, 2
1.51893062774937]

-----
- Time interval n.3: [538.96, 539.16]
  * y_true: [24.26158149 22.202218 ]
  * v_ann: [20.8293399810791, 19.952404022216797, 21.
51893062774937]

-----
* err= 0.41318767882271373
* Learning rate NN = 0.000478296831715852
* diff = 1 974985984409816e-05
```



For scene 12/18

\* use LR\_NN=0.001 with err=14.520747172247985 at it=19

\* v0\_scn\_mean = 22.245817942497307

\* MAE = 0.41297846146431033

---



---

- Time interval n.0: [541.16, 541.36]  
 \* y\_true: [22.67086863 28.23390149]  
 \* v\_ann: [23.810476303100586, 24.71294403076172, 2  
 0.490059693195878]

---

- Time interval n.1: [541.36, 541.56]  
 \* y\_true: [19.45088023 23.11862329]  
 \* v\_ann: [23.745708465576172, 23.835309982299805, 2  
 0.490059693195878]

---

- Time interval n.2: [541.56, 541.76]  
 \* y\_true: [24.96136667 24.68114114]  
 \* v\_ann: [23.618375778198242, 23.11260414123535, 2  
 0.490059693195878]

---

- Time interval n.3: [541.76, 541.96]  
 \* y\_true: [23.96154506 23.41644837]  
 \* v\_ann: [23.650537490844727, 23.015804290771484, 2

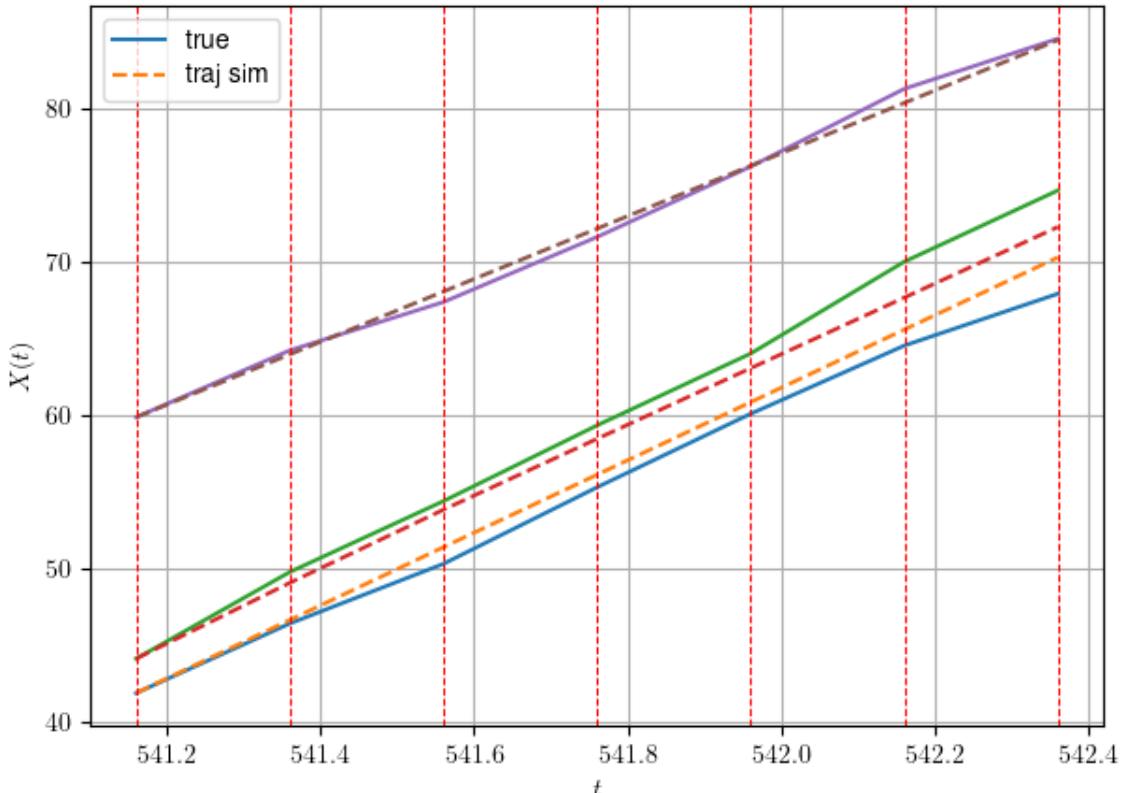
$0.490059693195878]$

```
- Time interval n.4: [541.96, 542.16]
  * y_true: [22.22167267 29.9460798 ]
  * v_ann: [23.670793533325195, 23.017704010009766, 2
0.490059693195878]
```

```
- Time interval n.5: [542.16, 542.36]
  * y_true: [16.91142821 23.23526684]
  * v_ann: [23.537181854248047, 23.039913177490234, 2
0.490059693195878]
```

```
* err= 1.16720450164415  
* Learning rate NN = 3.138104875688441e-05  
* diff = 0.0000000000000007
```

*df n. 2 – Scene n. 13, at it = 350*



For scene 13/18

\* use LR\_NN=0.0001 with err=43.982369727862185 at it=19  
\* v0\_scn\_mean = 21.305128485774674  
\* MAF = 1.1108335875983493

```
=====
=====
- Time interval n.0: [549.76, 549.96]
  * y_true: [23.30098965 17.25125335]
  * v_ann: [21.874391555786133, 22.064350128173828, 2
2.495773750079731]
```

```

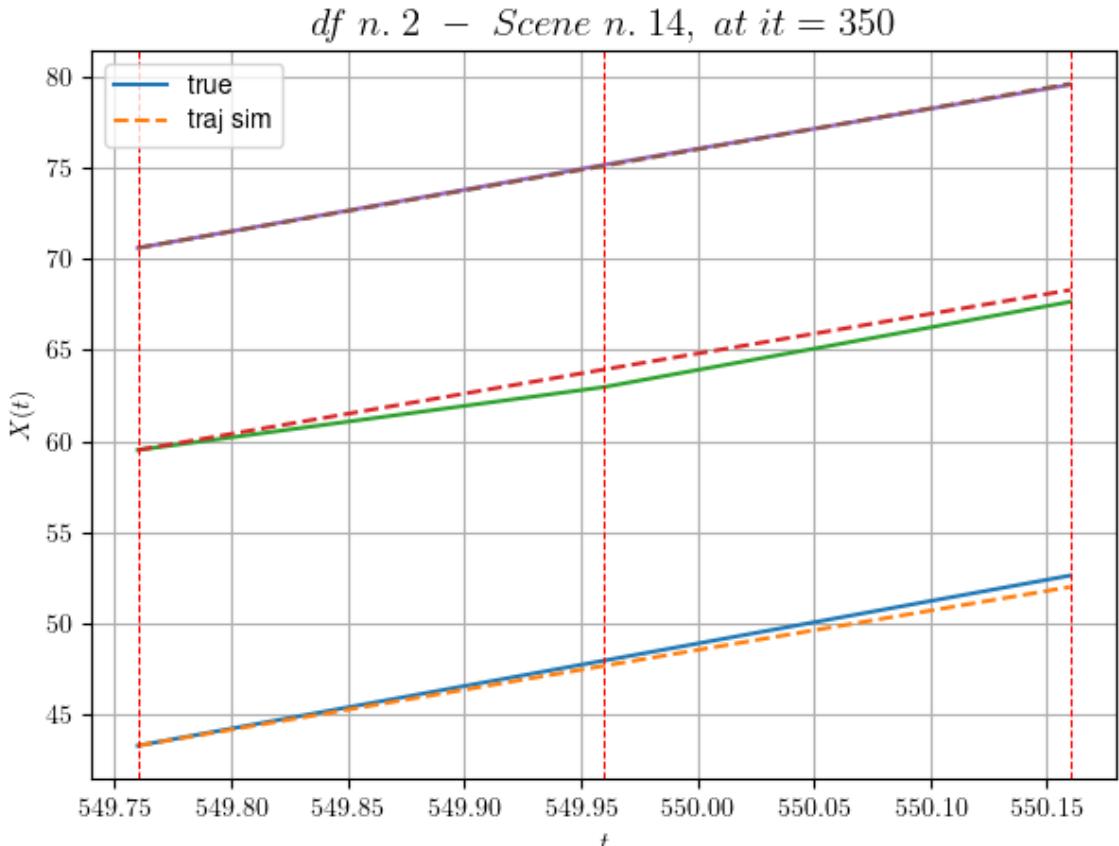
- Time interval n.1: [549.96, 550.16]
  * y_true: [23.30098965 23.35192881]
  * v_ann: [21.59547233581543, 21.771080017089844, 2
  2.49577375007973]

```

```

* err= 0.2027687779573408
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00025705995856634134

```



For scene 14/18

```

* use LR_NN=0.0001 with err=1.395420506348378 at it=19
* v0_scn_mean = 23.138938736550347
* MAE = 0.16694185835988148

```

```

=====
=====
- Time interval n.0: [566.76, 566.96]
  * y_true: [31.35080123 25.9264585 ]
  * v_ann: [27.511228561401367, 26.101016998291016, 2
  4.22256213825041]

```

```

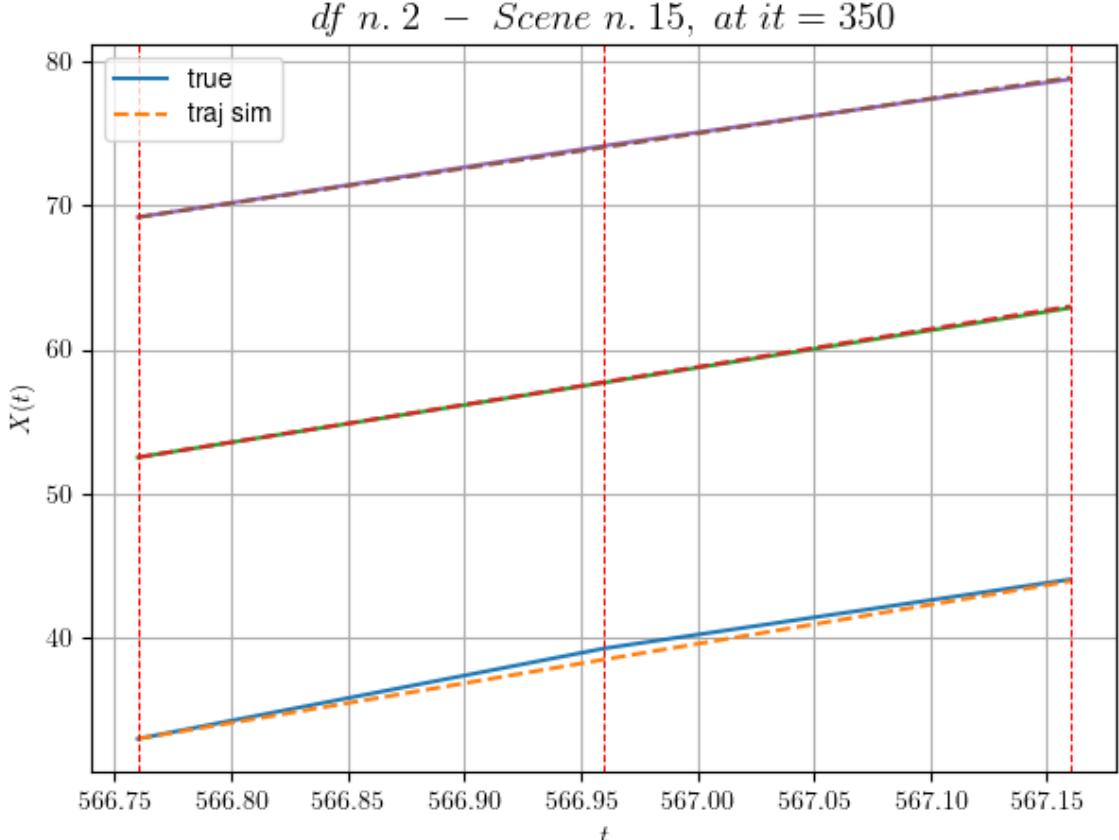
=====
=====
- Time interval n.1: [566.96, 567.16]
  * y_true: [23.95081051 25.9264585 ]
  * v_ann: [27.171405792236328, 26.330488204956055, 2
  4.22256213825041]

```

```

* err= 0.07173537685355076
* Learning rate NN = 7.289998757187277e-05
* diff = 1.0942001379271593e-05

```



For scene 15/18

```

* use LR_NN=0.0001 with err=0.8363407157236997 at it=19
* v0_scn_mean = 24.71772921083439
* MAE = 0.07173537685355076

```

---



---



---

- Time interval n.0: [87.56, 87.76]  
\* y\_true: [20.56019483 17.07029985 18.3510221 ]  
\* v\_ann: [20.089262008666992, 19.656599044799805, 1  
9.054790496826172, 23.40004168474024]

---



---



---



---

- Time interval n.1: [87.76, 87.96]  
\* y\_true: [21.72029145 17.49039467 19.46124504]  
\* v\_ann: [20.170461654663086, 19.703630447387695, 1  
8.869375228881836, 23.40004168474024]

---



---



---



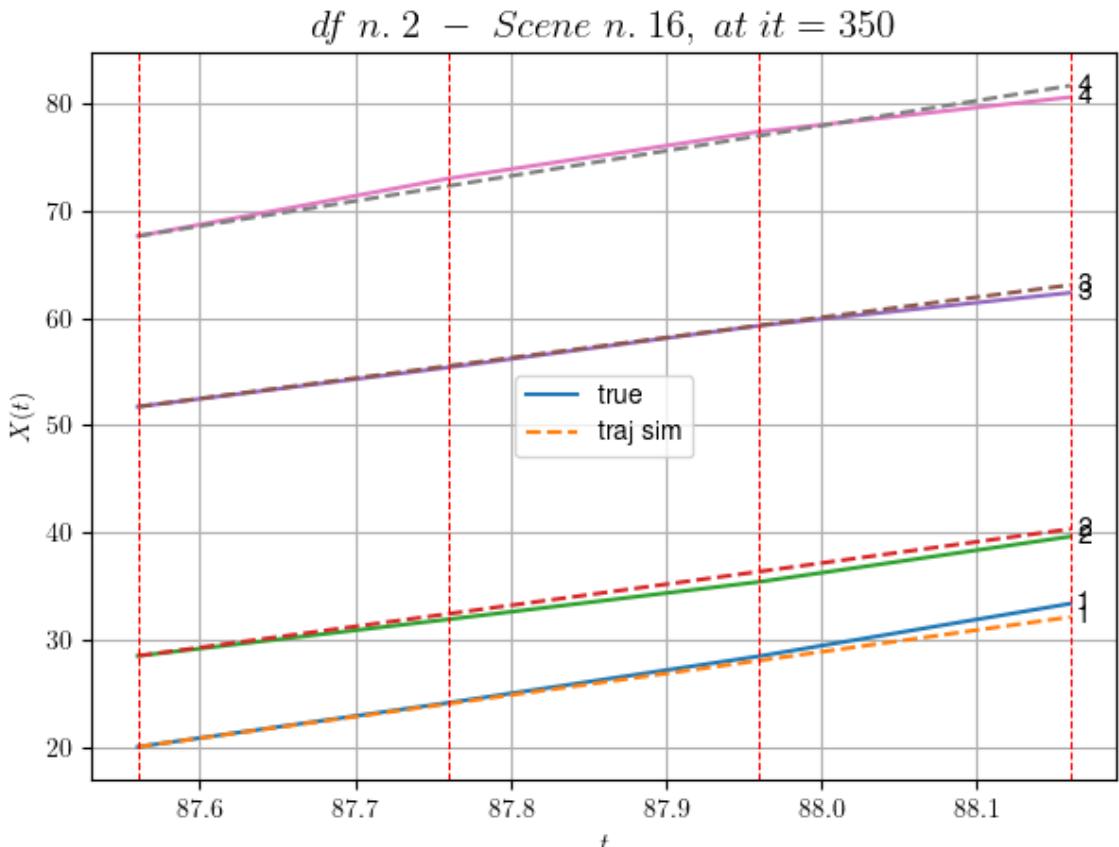
---

- Time interval n.2: [87.96, 88.16]  
\* y\_true: [24.51045762 21.12058621 15.36109554]  
\* v\_ann: [20.300704956054688, 19.85335922241211, 1  
8.851964950561523, 23.40004168474024]

```

* err= 0.35935487255615317
* Learning rate NN = 2.952449540316593e-05
* diff = 0.001137237716421935

```



For scene 16/18

```

* use LR_NN=5e-05 with err=9.966393831838543 at it=19
* v0_scn_mean = 24.153365501346627
* MAE = 0.34785445573920715

```

---



---



---

- Time interval n.0: [305.96, 306.16]  
\* y\_true: [18.64270885 18.88070057 19.63111636]  
\* v\_ann: [20.603214263916016, 20.588153839111328, 2  
0.539918899536133, 13.683661586234587]

---



---



---

- Time interval n.1: [306.16, 306.36]  
\* y\_true: [22.41204338 21.34093202 20.7913521 ]  
\* v\_ann: [20.074935913085938, 20.002628326416016, 1  
9.791854858398438, 13.683661586234587]

---



---

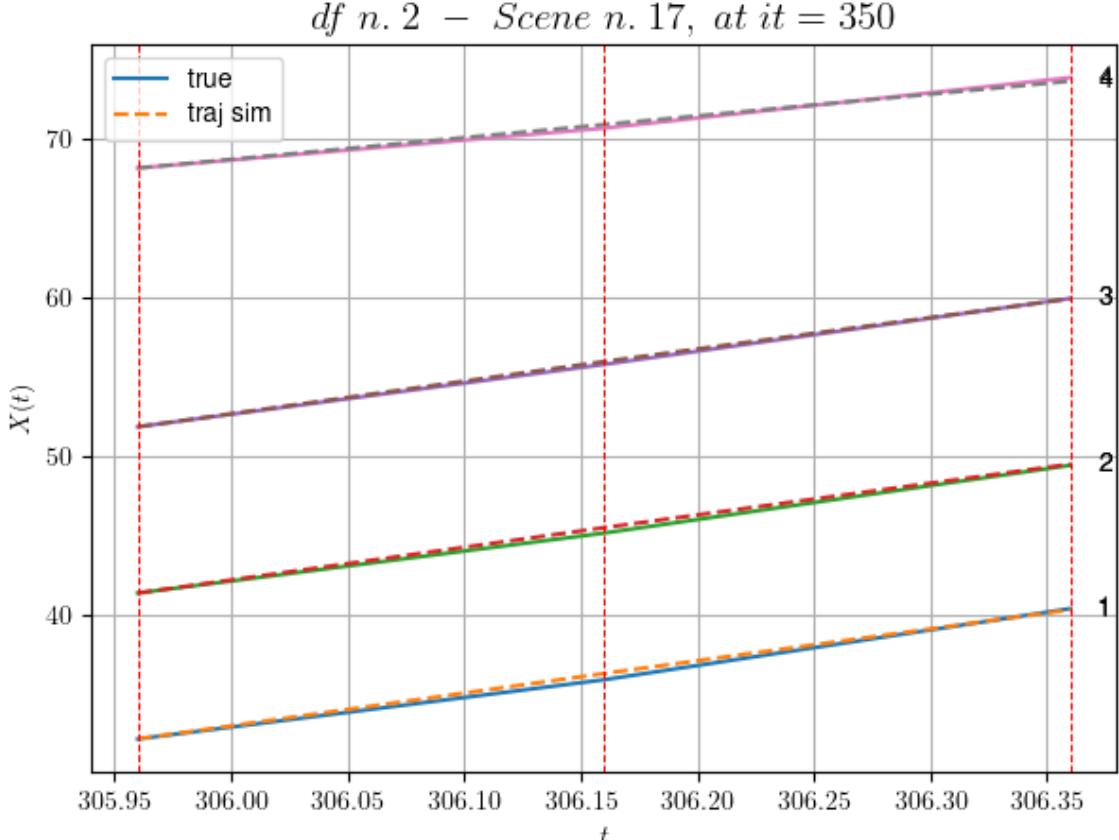


---

```

* err= 0.03488589376044854
* Learning rate NN = 0.00036449998151510954
* diff = 1.781449487488207e-06

```



For scene 17/18

- \* use LR\_NN=0.0005 with err=5.395699278202143 at it=19
- \* v0\_scn\_mean = 15.546019761812973
- \* MAE = 0.034808470499011784

---



---

For df=2 with 18 scenes, time taken: 188.41

---



---

In df n.3/10 we have 55 scenes

---



---

- Time interval n.0: [16.16, 16.36]
- \* y\_true: [27.36596872 40.6089382 ]
- \* v\_ann: [28.048744201660156, 27.266494750976562, 3 9.22721511204396]

---

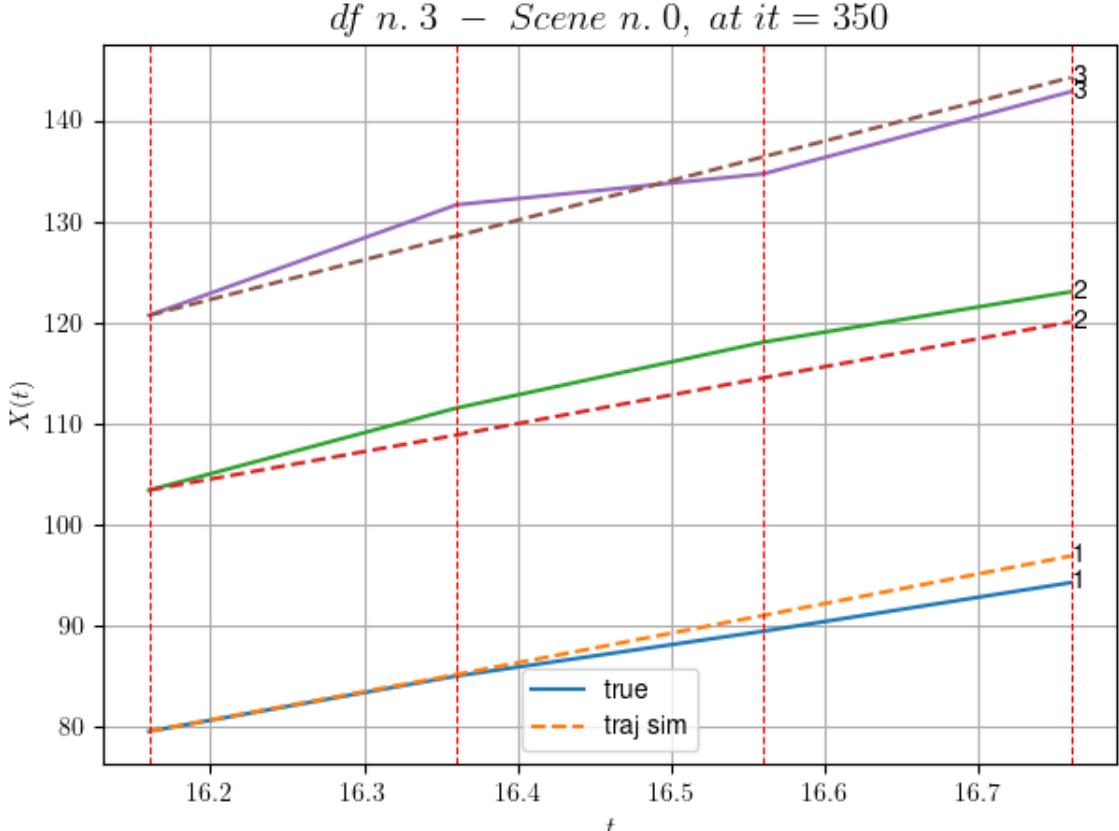
- Time interval n.1: [16.36, 16.56]
- \* y\_true: [22.16572117 32.62072047]
- \* v\_ann: [29.310449600219727, 28.323429107666016, 3 9.22721511204396]

---

- Time interval n.2: [16.56, 16.76]

```
* y_true: [24.04131334 24.91936545]
* v_ann: [29.387426376342773, 27.64037322998047, 3
9.22721511204396]
```

```
-----  
-----  
* err= 4.353951793819733  
* Learning rate NN = 2.952449540316593e-05  
* diff = 0.0116752141432368
```



For scene 0/55

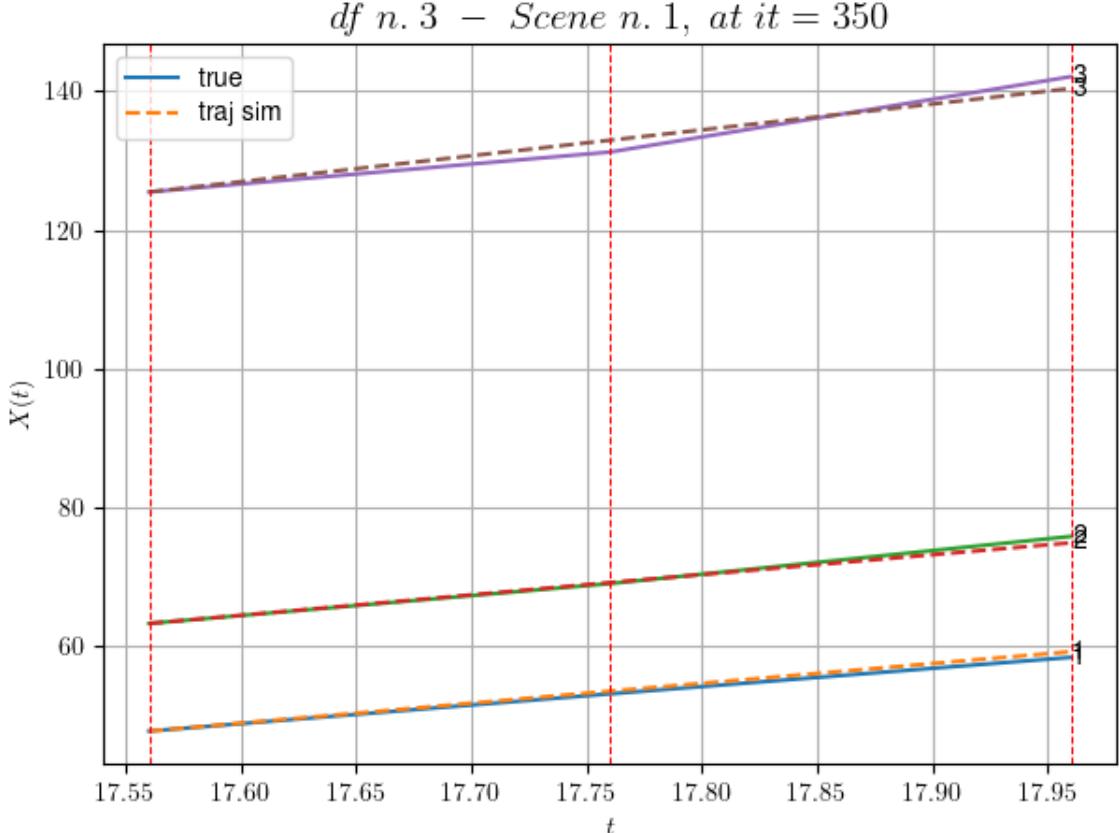
```
* use LR_NN=5e-05 with err=13.361026623270396 at it=19
* v0_scn_mean = 38.43637785780195
* MAE = 4.353951793819733
```

```
=====  
-----  
-----  
- Time interval n.0: [17.56, 17.76]  
* y_true: [26.87631442 28.75240293]  
* v_ann: [28.793251037597656, 29.521400451660156, 3
7.341555892655315]
```

```
-----  
-----  
- Time interval n.1: [17.76, 17.96]  
* y_true: [26.32655772 34.05345458]  
* v_ann: [28.49280548095703, 28.669647216796875, 3
7.341555892655315]
```

```
-----  
-----  
* err= 0.832967994026598
```

\* Learning rate NN = 3.6449993785936385e-05  
 \* diff = 0.0012537492542704642



For scene 1/55

\* use LR\_NN=5e-05 with err=9.729200006264632 at it=19  
 \* v0\_scn\_mean = 36.71233290028849  
 \* MAE = 0.7716615097696398

- 
- 
- Time interval n.0: [23.96, 24.16]
    - \* y\_true: [31.9527567 21.95230333]
    - \* v\_ann: [24.833415985107422, 24.90239715576172, 27.016685910779756]

---

  - Time interval n.1: [24.16, 24.36]
    - \* y\_true: [26.79271708 14.85171745]
    - \* v\_ann: [26.075809478759766, 27.637378692626953, 27.016685910779756]

---

  - Time interval n.2: [24.36, 24.56]
    - \* y\_true: [20.5424093 31.65411216]
    - \* v\_ann: [24.97212791442871, 23.207645416259766, 27.016685910779756]

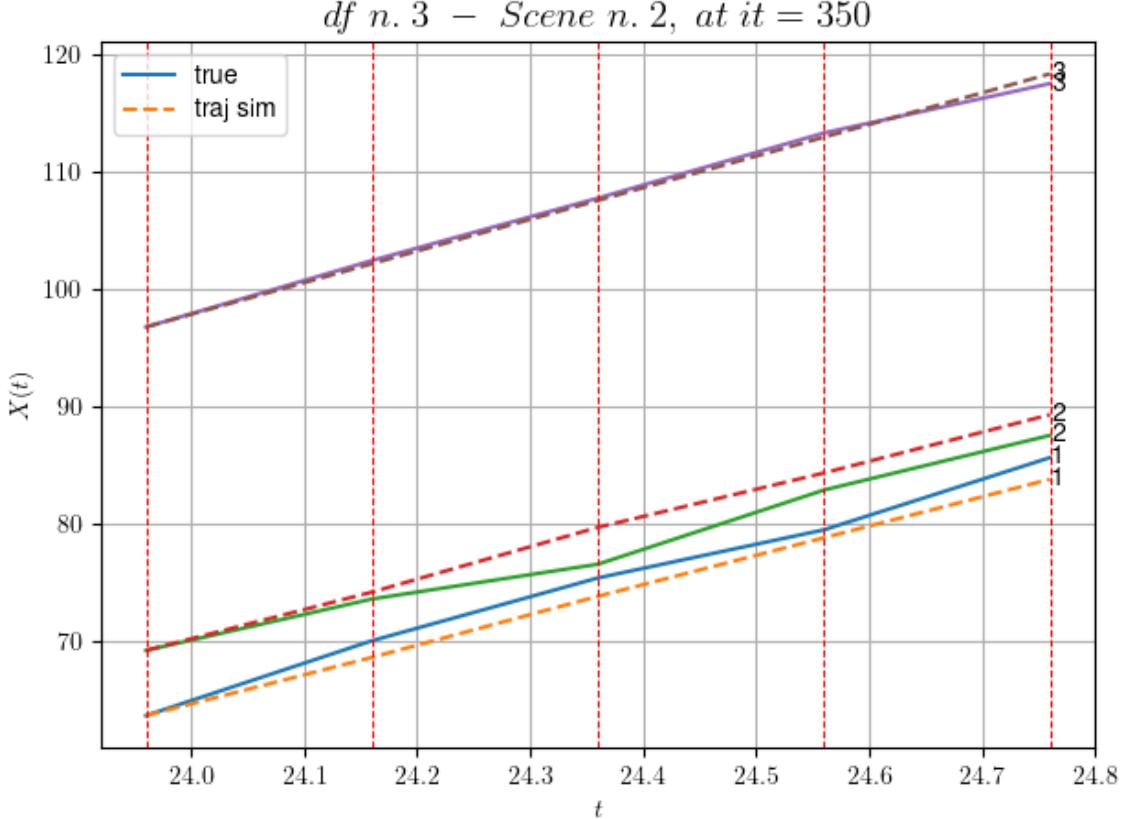
---

  - Time interval n.3: [24.56, 24.76]

```
* y_true: [30.8240747 23.35345154]
* v_ann: [24.995576858520508, 24.89579963684082, 2
7.016685910779756]
```

---

```
* err= 1.6526633898171241
* Learning rate NN = 0.000478296831715852
* diff = 0.00019294590573259995
```



For scene 2/55

```
* use LR_NN=0.001 with err=36.485544404950936 at it=19
* v0_scn_mean = 27.272376917677487
* MAE = 1.6522893015905062
```

---



---

```
- Time interval n.0: [42.96, 43.16]
* y_true: [34.44093898 36.40531345]
* v_ann: [25.164583206176758, 25.16484260559082, 2
7.35069258451137]
```

---



---

```
- Time interval n.1: [43.16, 43.36]
* y_true: [27.09071898 44.10770887]
* v_ann: [34.052330017089844, 32.04876708984375, 2
7.35069258451137]
```

---



---

```
- Time interval n.2: [43.36, 43.56]
* y_true: [24.51583897 25.2301032 ]
```

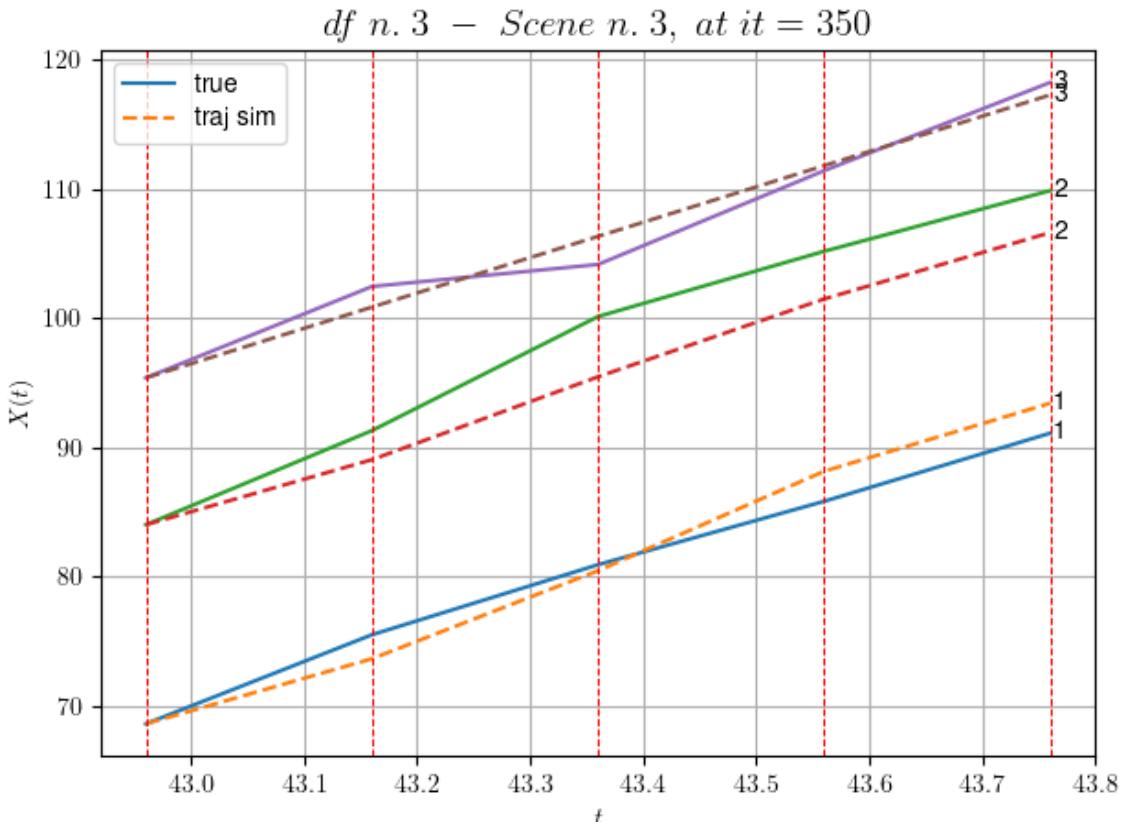
```
* v_ann: [38.458961486816406, 30.08537483215332, 2  
7.35069258451137]
```

---

```
- Time interval n.3: [43.56, 43.76]  
* y_true: [26.35394512 23.45522926]  
* v_ann: [26.304990768432617, 25.68773651123047, 2  
7.35069258451137]
```

---

```
* err= 4.91048577036275  
* Learning rate NN = 0.000478296831715852  
* diff = 0.008959670337106651
```



For scene 3/55

```
* use LR_NN=0.001 with err=21.867979002337098 at it=19  
* v0_scn_mean = 27.57775686952768  
* MAE = 4.29173008188292
```

---



---

```
- Time interval n.0: [61.76, 61.96]  
* y_true: [28.79377133 7.10177762]  
* v_ann: [31.65740394592285, 30.2014217376709, 27.8  
30106096169654]
```

---

```
- Time interval n.1: [61.96, 62.16]  
* y_true: [41.29768472 31.64601894]  
* v_ann: [19.849515914916992, 22.407230377197266, 2
```

7.830106096169654]

```

-----  

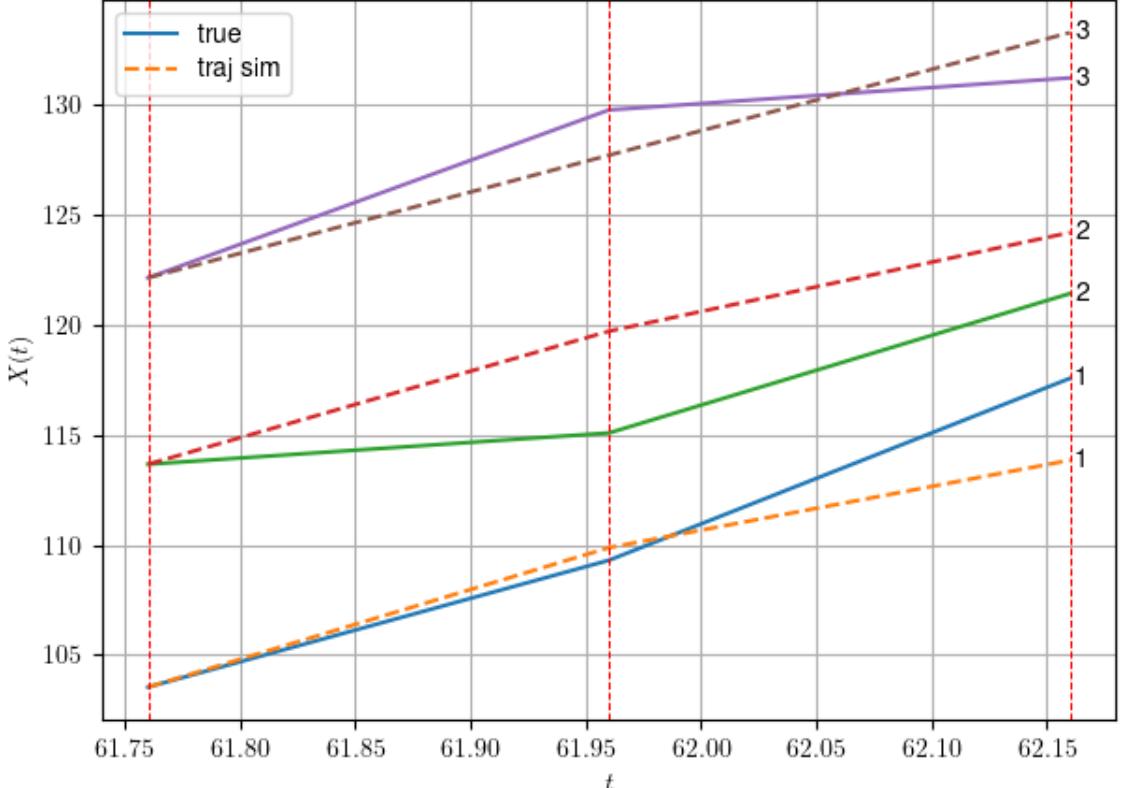
* err= 5.735607087156031  

* Learning rate NN = 0.0007289999630302191  

* diff = 0.001449748599624101

```

df n. 3 – Scene n. 4, at it = 350



For scene 4/55

```

* use LR_NN=0.001 with err=7.304374593595186 at it=19  

* v0_scn_mean = 28.016081270267517  

* MAE = 5.549247779151273

```

```

=====
=====  

- Time interval n.0: [63.76, 63.96]  

* y_true: [39.33120973 30.97229006]  

* v_ann: [30.517738342285156, 28.51445198059082, 3  

3.83985492803379]

```

```

=====
- Time interval n.1: [63.96, 64.16]  

* y_true: [32.2308074 22.86038312]  

* v_ann: [33.975276947021484, 30.869537353515625, 3  

3.83985492803379]

```

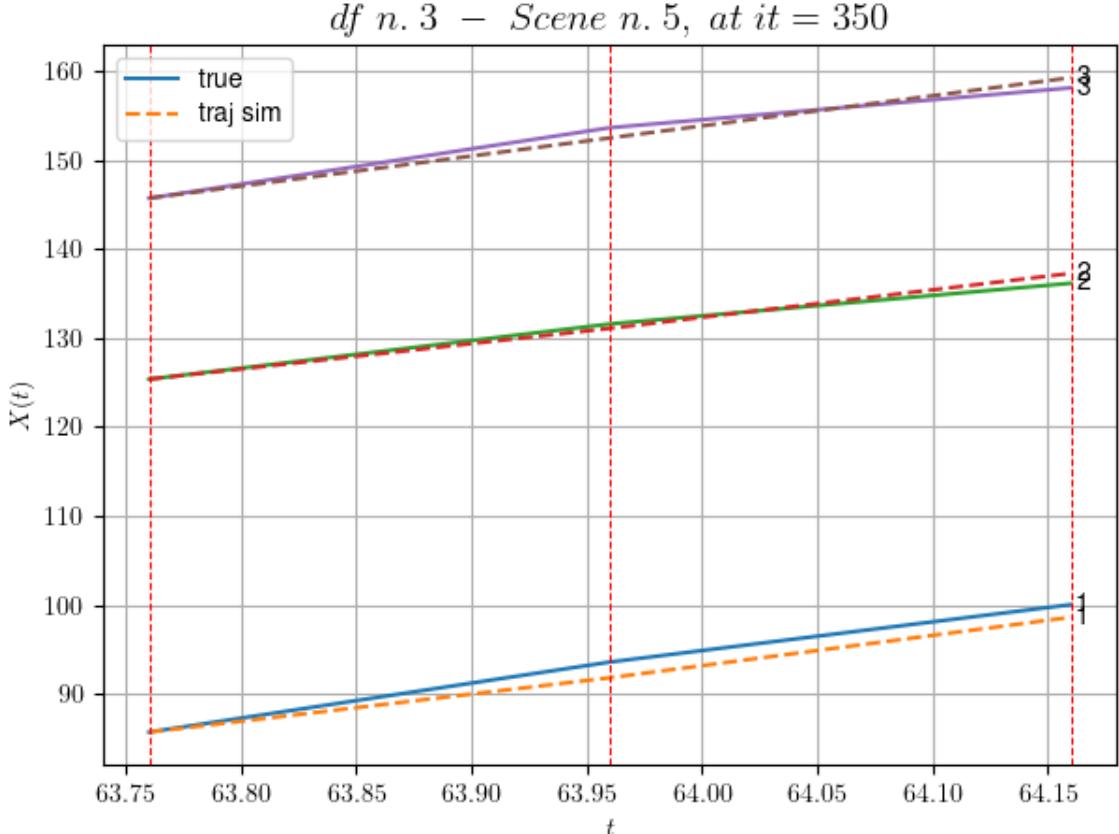
```

* err= 1.0226880377283867  

* Learning rate NN = 7.289998757187277e-05  

* diff = 0.0049658066815616575

```



For scene 5/55

```
* use LR_NN=0.0001 with err=1.9465704489023041 at it=19
* v0_scn_mean = 33.51075234495746
* MAE = 0.6115360269584328
```

---



---

For scene 6/55

```
* use LR_NN=0.0005 with err=4.112349405209885 at it=19
* v0_scn_mean = 31.950559826831626
* MAE = 4.64490111920129
```

---



---

```
- Time interval n.0: [72.76, 72.96]
  * y_true: [28.501496 30.93407752]
  * v_ann: [32.75737762451172, 29.795425415039062, 2
8.121253838742764]
```

---

```
- Time interval n.1: [72.96, 73.16]
  * y_true: [36.65243351 31.9148258 ]
  * v_ann: [32.03829574584961, 28.90294075012207, 28.
121253838742764]
```

---

```
- Time interval n.2: [73.16, 73.36]
```

```
* y_true: [27.70226144 28.33497935]
* v_ann: [33.169639587402344, 29.055076599121094, 2
8.121253838742764]

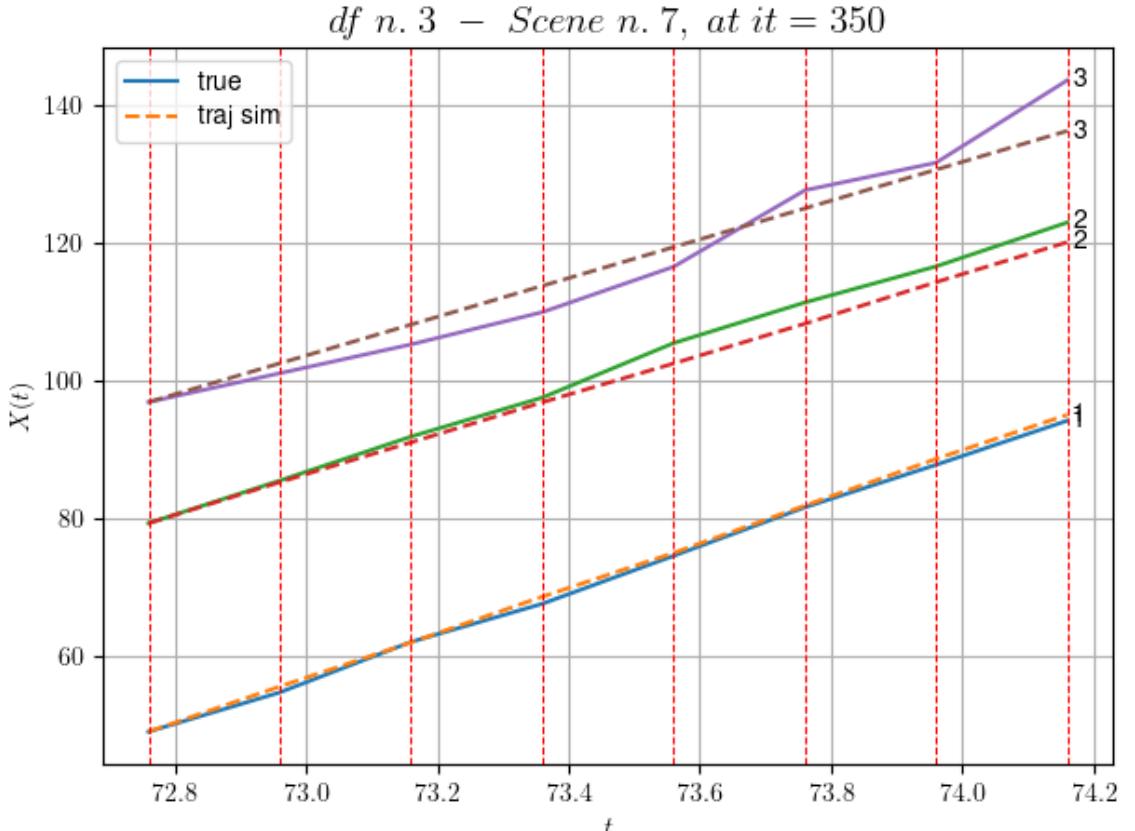
-----
- Time interval n.3: [73.36, 73.56]
* y_true: [34.7534691 39.55781959]
* v_ann: [31.745525360107422, 28.201339721679688, 2
8.121253838742764]

-----
- Time interval n.4: [73.56, 73.76]
* y_true: [35.21414381 29.47666535]
* v_ann: [34.397987365722656, 28.863059997558594, 2
8.121253838742764]

-----
- Time interval n.5: [73.76, 73.96]
* y_true: [30.89430642 26.20657024]
* v_ann: [33.86547088623047, 30.1767520904541, 28.1
21253838742764]

-----
- Time interval n.6: [73.96, 74.16]
* y_true: [32.05509091 31.88895952]
* v_ann: [32.06039810180664, 29.022607803344727, 2
8.121253838742764]

-----
* err= 5.474655644058365
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.07736288473001451
```



For scene 7/55

\* use LR\_NN=0.0001 with err=50.49119882128681 at it=19  
 \* v0\_scn\_mean = 28.282275602898533  
 \* MAE = 5.474655644058365

---



---

- Time interval n.0: [82.16, 82.36]  
 \* y\_true: [30.54468004 23.04450554]  
 \* v\_ann: [28.90880584716797, 31.91478157043457, 27.  
 550255115280457]

---

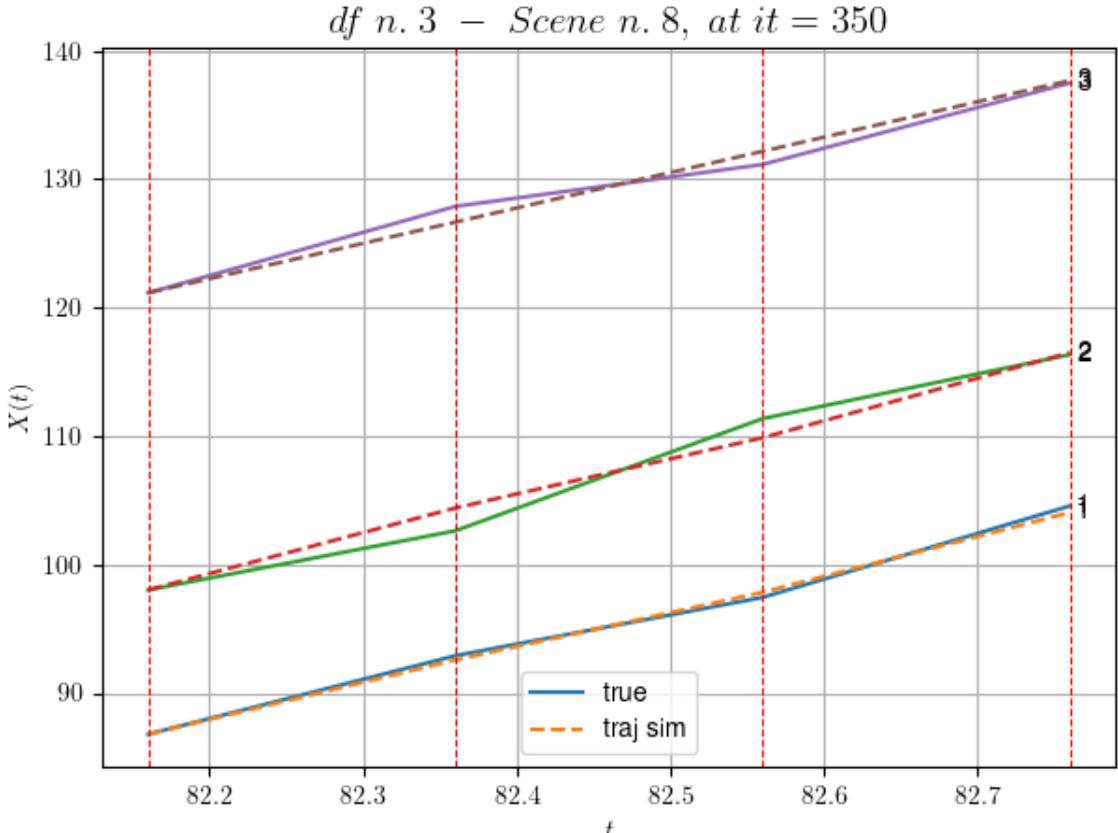
- Time interval n.1: [82.36, 82.56]  
 \* y\_true: [22.71402344 43.65971655]  
 \* v\_ann: [26.315135955810547, 27.34038543701172, 2  
 7.550255115280457]

---

- Time interval n.2: [82.56, 82.76]  
 \* y\_true: [35.61686857 24.88594316]  
 \* v\_ann: [31.09992027282715, 33.126609802246094, 2  
 7.550255115280457]

---

\* err= 0.707567045904995  
 \* Learning rate NN = 0.0002952449722215533  
 \* diff = 6.827693471833651e-05



For scene 8/55

- \* use LR\_NN=0.0005 with err=7.422936251527934 at it=19
- \* v0\_scn\_mean = 27.760215487364636
- \* MAE = 0.7070356722459349

---



---

- Time interval n.0: [86.16, 86.36]
- \* y\_true: [27.89181051 25.45740923]
- \* v\_ann: [29.158720016479492, 31.686452865600586, 35.764694958435065]

---

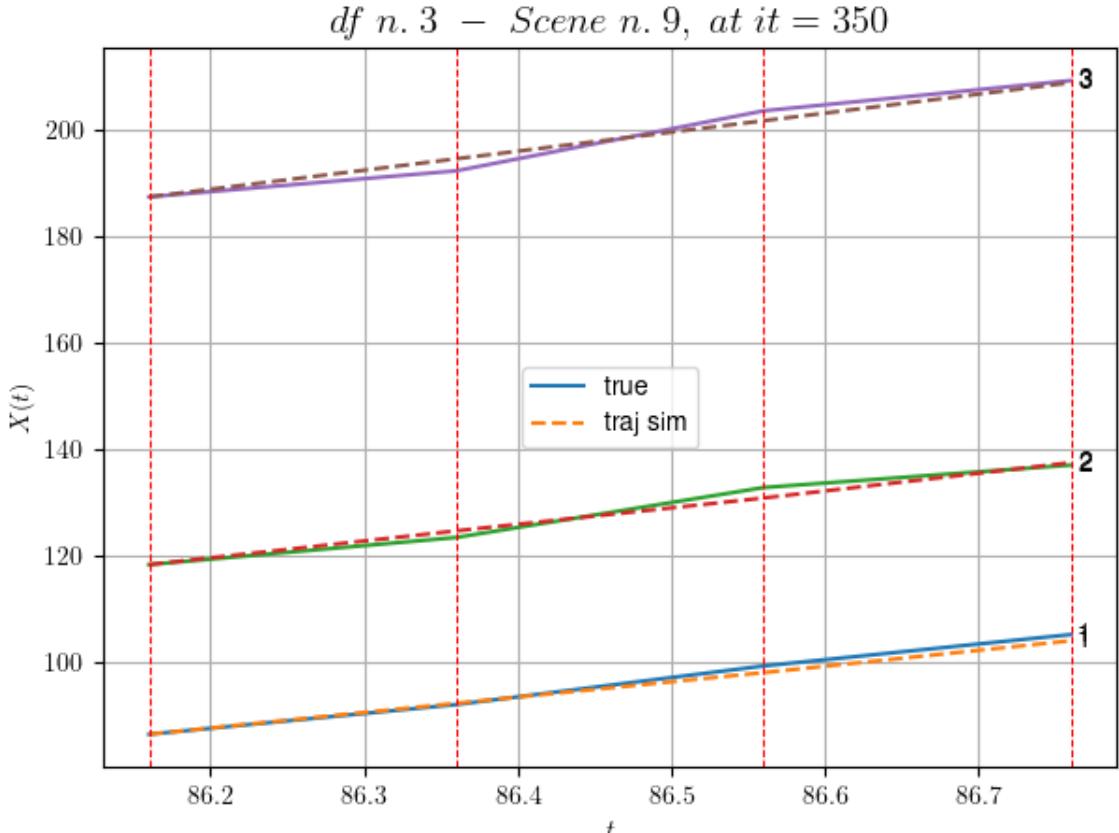
- Time interval n.1: [86.36, 86.56]
- \* y\_true: [36.25627338 46.92477715]
- \* v\_ann: [28.74485969543457, 30.84695816040039, 35.764694958435065]

---

- Time interval n.2: [86.56, 86.76]
- \* y\_true: [29.50579063 21.07714474]
- \* v\_ann: [29.959199905395508, 33.236812591552734, 35.764694958435065]

---

- \* err= 1.4446525193855593
- \* Learning rate NN = 5.9048988987342454e-06
- \* diff = 0.001467057630589963



For scene 9/55

```
* use LR_NN=1e-05 with err=13.756993865430431 at it=19
* v0_scn_mean = 35.27062004231872
* MAE = 1.4446525193855593
```

---



---

- Time interval n.0: [130.96, 131.16]
  - \* y\_true: [15.85249734 39.95916833]
  - \* v\_ann: [32.83820343017578, 31.172481536865234, 31.75232522302462]
  
- Time interval n.1: [131.16, 131.36]
  - \* y\_true: [19.2732587 14.0236874]
  - \* v\_ann: [34.78976058959961, 28.814334869384766, 31.75232522302462]
  
- Time interval n.2: [131.36, 131.56]
  - \* y\_true: [20.77382027 41.90201833]
  - \* v\_ann: [32.3190803527832, 28.757368087768555, 31.75232522302462]
  
- Time interval n.3: [131.56, 131.76]
  - \* y\_true: [36.06757222 59.75967406]
  - \* v\_ann: [34.13119888305664, 29.707548141479492, 31.75232522302462]

1.75232522302462]

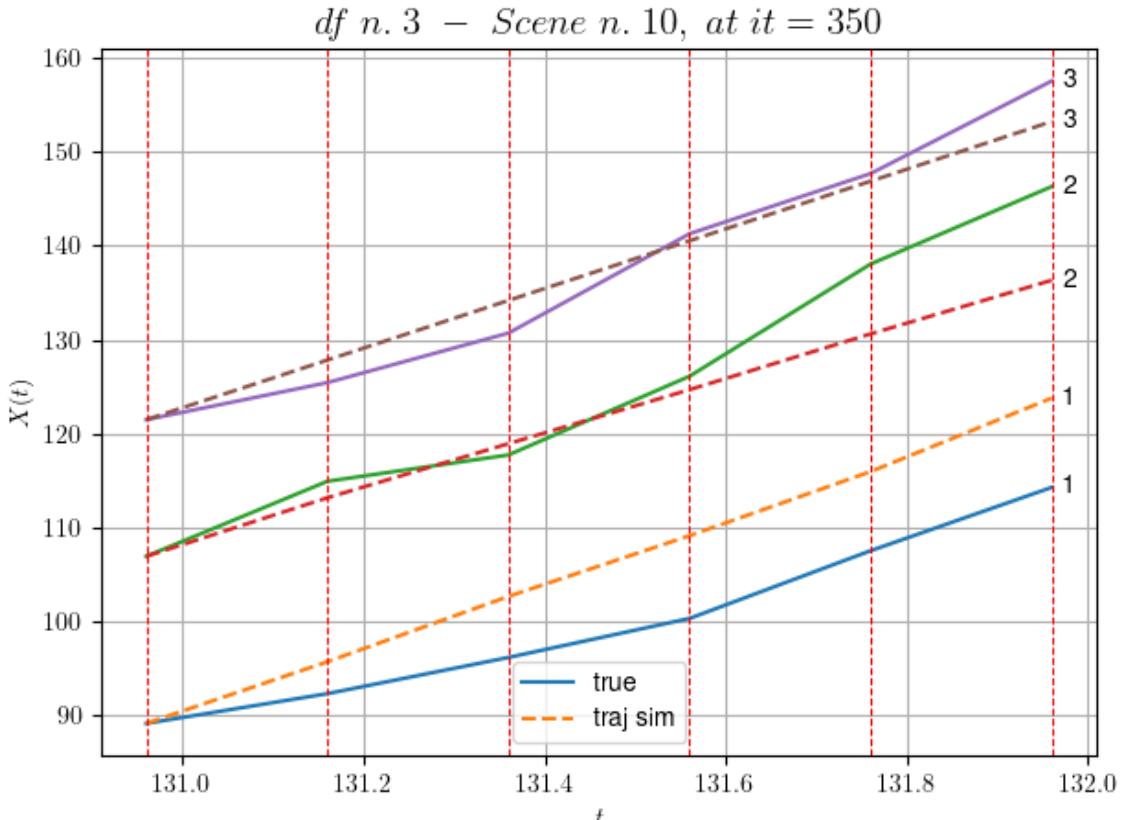
---

- Time interval n.4: [131.76, 131.96]
  - \* y\_true: [33.71775213 41.23564164]
  - \* v\_ann: [39.14916229248047, 28.541744232177734, 3]

1.75232522302462]

---

- \* err= 27.330379184361206
- \* Learning rate NN = 3.874203684972599e-05
- \* diff = 0.02257791649213914



For scene 10/55

- \* use LR\_NN=0.0001 with err=58.08182832521323 at it=19
- \* v0\_scn\_mean = 31.602138622724556
- \* MAE = 20.94276895763026

---



---

- Time interval n.0: [139.16, 139.36]
  - \* y\_true: [22.50033849 31.62238978]
  - \* v\_ann: [26.650482177734375, 27.907690048217773, 2]

8.144643973847373]

---



---



---

- Time interval n.1: [139.36, 139.56]
  - \* y\_true: [29.90063418 17.15160439]
  - \* v\_ann: [27.371572494506836, 27.638675689697266, 2]

8.144643973847373]

```
- Time interval n.2: [139.56, 139.76]
  * y_true: [27.10078793 37.57385655]
  * v_ann: [25.944368362426758, 27.62425422668457, 2
8.144643973847373]

-----
- Time interval n.3: [139.76, 139.96]
  * y_true: [25.40095052 21.65266443]
  * v_ann: [27.39519691467285, 28.0828857421875, 28.1
44643973847373]

-----
- Time interval n.4: [139.96, 140.16]
  * y_true: [21.40097883 32.03445568]
  * v_ann: [26.648662567138672, 27.46331024169922, 2
8.144643973847373]

-----
- Time interval n.5: [140.16, 140.36]
  * y_true: [21.7011754 31.91506312]
  * v_ann: [27.466142654418945, 27.380037307739258, 2
8.144643973847373]

-----
- Time interval n.6: [140.36, 140.56]
  * y_true: [30.50199276 23.65435061]
  * v_ann: [28.219017028808594, 26.95656394958496, 2
8.144643973847373]

-----
- Time interval n.7: [140.56, 140.76]
  * y_true: [27.90220498 42.04863469]
  * v_ann: [27.554336547851562, 27.8885555267334, 28.
144643973847373]

-----
- Time interval n.8: [140.76, 140.96]
  * y_true: [45.30444602 33.92792147]
  * v_ann: [29.63373565673828, 28.247743606567383, 2
8.144643973847373]

-----
- Time interval n.9: [140.96, 141.16]
  * y_true: [22.85268623 11.9131035 ]
  * v_ann: [29.998991012573242, 27.02206039428711, 2
8.144643973847373]

-----
- Time interval n.10: [141.16, 141.36]
```

```

* y_true: [15.65202595 30.01833255]
* v_ann: [27.609771728515625, 27.99901580810547, 2
8.144643973847373]

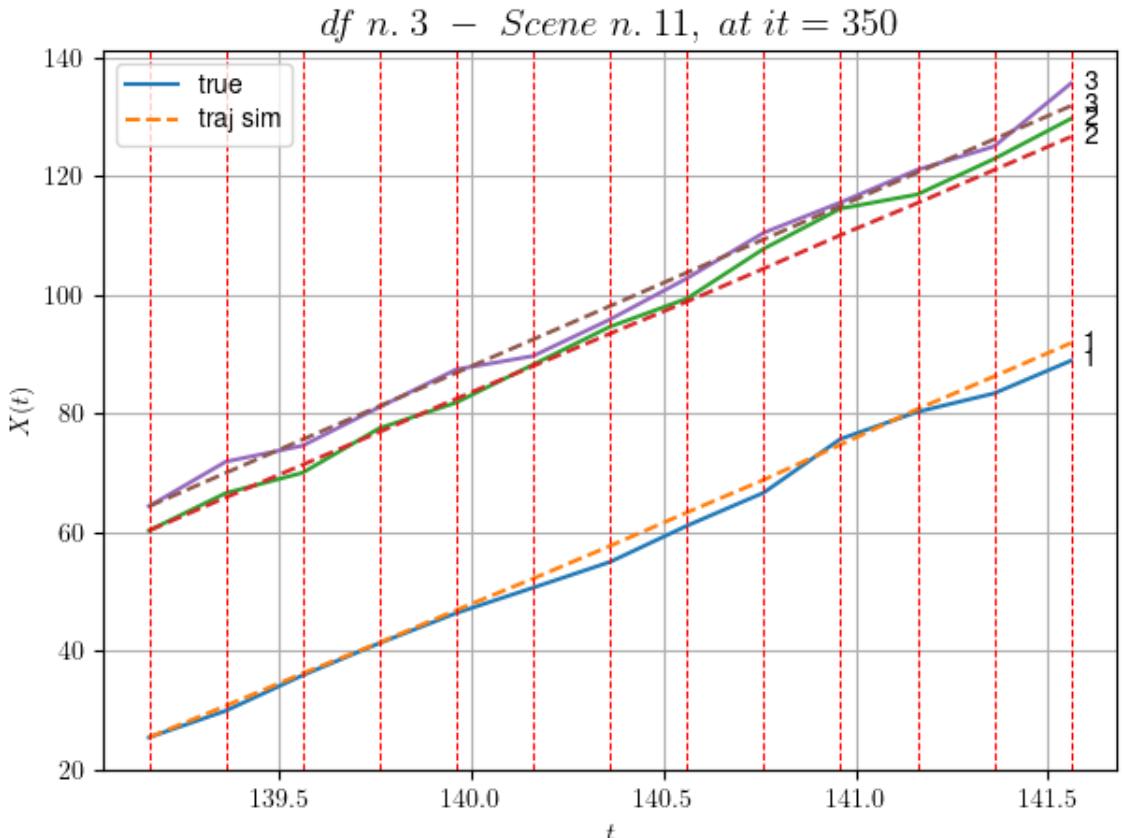
-----
- Time interval n.11: [141.36, 141.56]
* y_true: [27.55395105 33.94025545]
* v_ann: [28.191497802734375, 27.960552215576172, 2
8.144643973847373]

```

```

* err= 3.234343261793381
* Learning rate NN = 4.431466732057743e-05
* diff = 0.0015266543176055691

```



For scene 11/55

```

* use LR_NN=0.0005 with err=360.5982868046655 at it=19
* v0_scn_mean = 28.30366103886056
* MAE = 2.733962242012297
=====
```

```

- Time interval n.0: [143.76, 143.96]
* y_true: [30.62207823 41.7261053 ]
* v_ann: [28.892066955566406, 26.751686096191406, 2
9.414748692204874]

```

```

- Time interval n.1: [143.96, 144.16]

```

```

* y_true: [21.21173425 33.31570327]
* v_ann: [39.41748046875, 31.40980339050293, 29.414
748692204874]

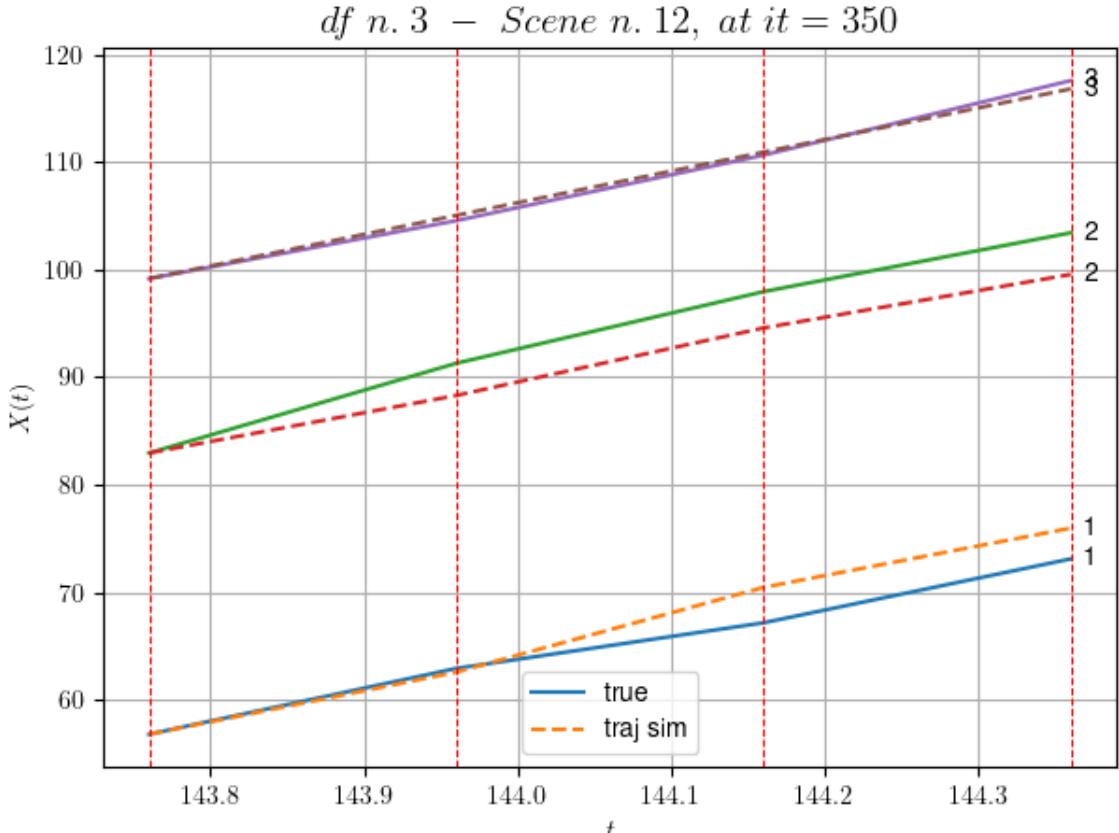
-----
- Time interval n.2: [144.16, 144.36]
* y_true: [29.72284222 27.36558717]
* v_ann: [27.577239990234375, 24.871374130249023, 2
9.414748692204874]

```

```

* err= 4.624773338331
* Learning rate NN = 0.0002952449722215533
* diff = 0.016864670141317206

```



For scene 12/55

```

* use LR_NN=0.0005 with err=17.39191509340238 at it=19
* v0_scn_mean = 29.46490884688656
* MAE = 4.624773338331

```

```

=====
- Time interval n.0: [149.36, 149.56]
* y_true: [25.90049539 27.45094024]
* v_ann: [26.557876586914062, 29.86421775817871, 2
3.443602704289308]

```

```

-----
- Time interval n.1: [149.56, 149.76]
* y_true: [21.18057417 22.42095425]

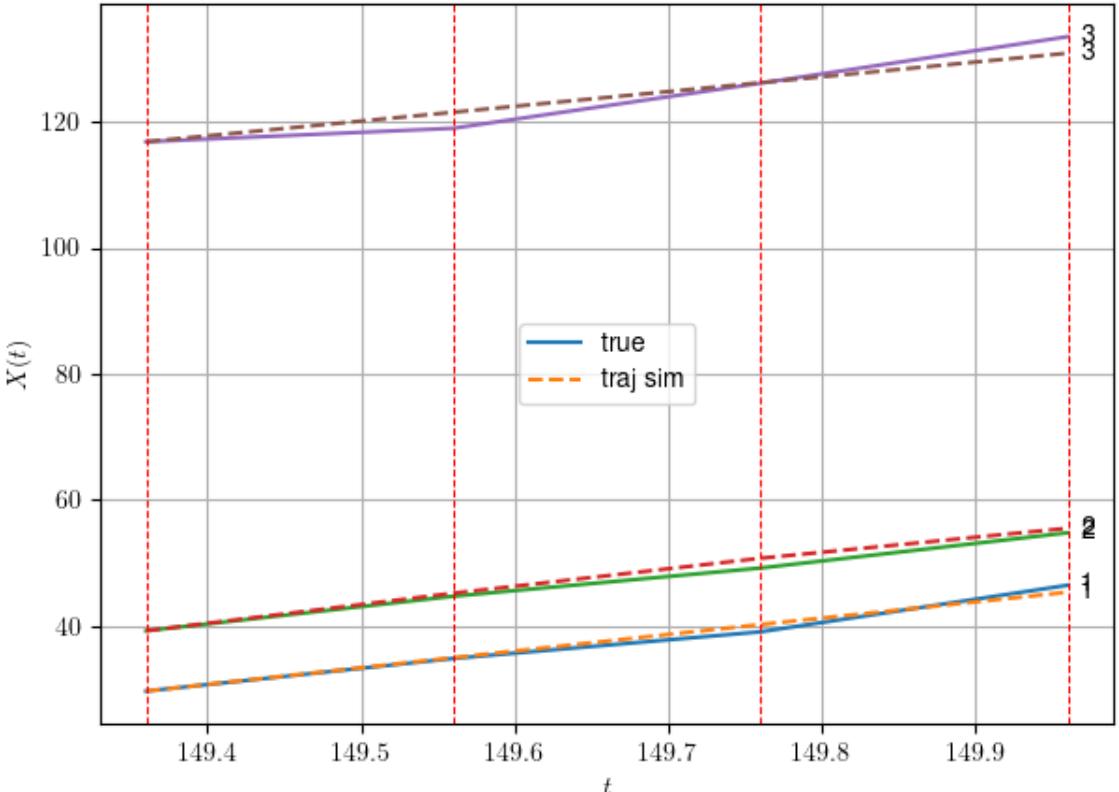
```

```
* v_ann: [26.28774070739746, 27.76011848449707, 23.443602704289308]
```

```
- Time interval n.2: [149.76, 149.96]
* y_true: [37.02126181 27.98148311]
* v_ann: [25.709930419921875, 23.842557907104492, 23.443602704289308]
```

```
* err= 1.5937763056583047
* Learning rate NN = 2.952449540316593e-05
* diff = 0.00041546943551473703
```

*df n. 3 – Scene n. 13, at it = 350*



For scene 13/55

```
* use LR_NN=5e-05 with err=27.9113339860794 at it=19
* v0_scn_mean = 24.00553208082386
* MAE = 1.5937763056583047
```

```
=====
=====
- Time interval n.0: [156.16, 156.36]
* y_true: [12.56997445 35.72646923]
* v_ann: [27.586942672729492, 29.636802673339844, 36.779567918369196]
```

```
=====
- Time interval n.1: [156.36, 156.56]
* y_true: [42.07610638 31.26485338]
```

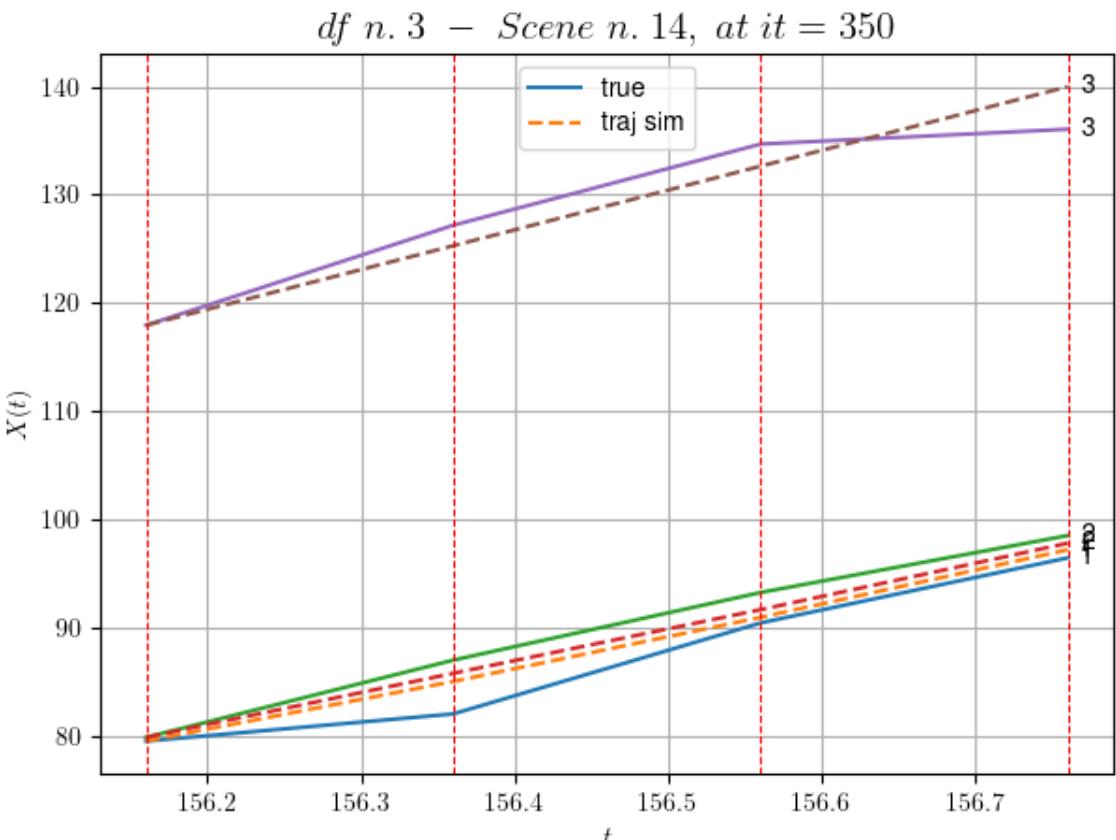
```

* v_ann: [29.628578186035156, 29.42110252380371, 3
6.779567918369196]

-----
- Time interval n.2: [156.56, 156.76]
* y_true: [30.09491831 26.35466702]
* v_ann: [31.275373458862305, 30.762439727783203, 3
6.779567918369196]

-----
* err= 3.1329954933777664
* Learning rate NN = 2.952449540316593e-05
* diff = 0.004095077913069289

```



For scene 14/55

```

* use LR_NN=5e-05 with err=31.819256956355474 at it=19
* v0_scn_mean = 36.19851124933002
* MAE = 3.1329954933777664

```

```

=====
=====

- Time interval n.0: [207.96, 208.16]
* y_true: [30.12104774 28.85226703]
* v_ann: [32.10042953491211, 31.405033111572266, 3
1.12490151678249]

=====
=====

- Time interval n.1: [208.16, 208.36]
* y_true: [31.19139939 27.73265496]

```

```
* v_ann: [28.987049102783203, 29.319673538208008, 3
1.12490151678249]
```

---

```
- Time interval n.2: [208.36, 208.56]
* y_true: [31.59181924 26.81292648]
* v_ann: [29.257877349853516, 29.3167667388916, 31.
```

```
1.12490151678249]
```

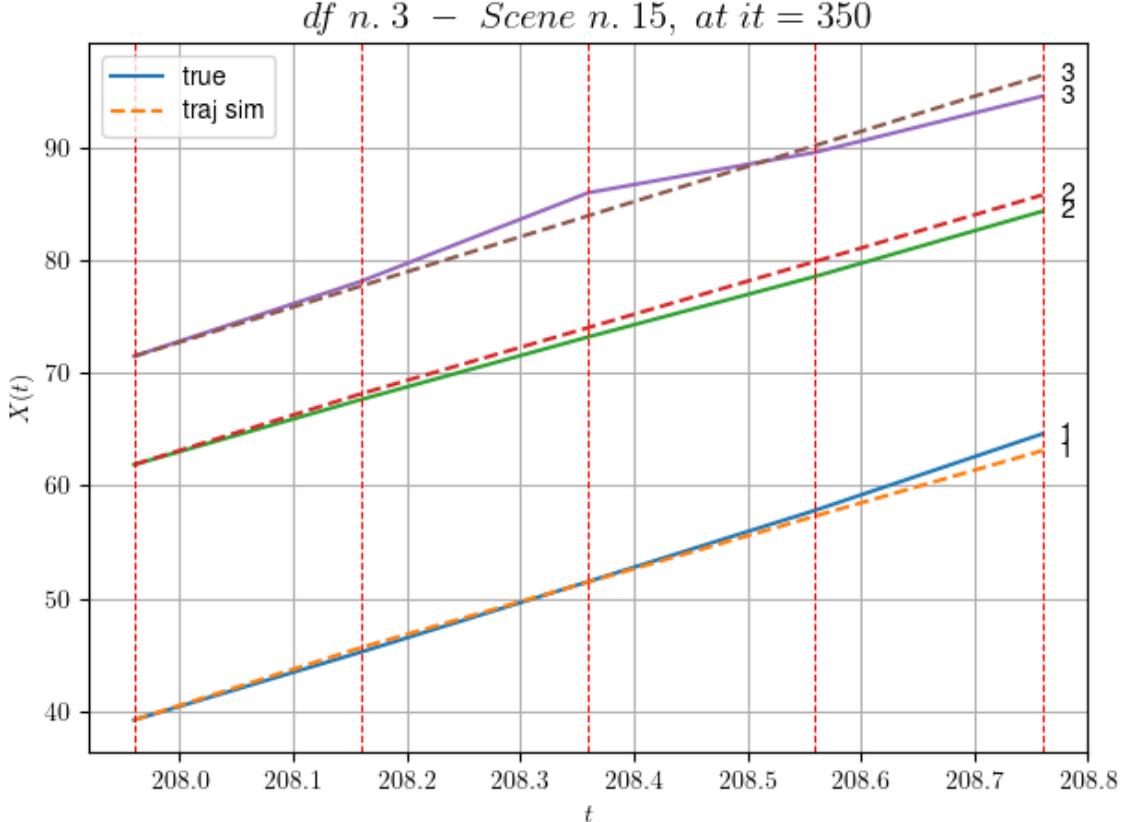
---

```
- Time interval n.3: [208.56, 208.76]
* y_true: [33.88244728 28.87369213]
* v_ann: [29.008609771728516, 29.451915740966797, 3
```

```
1.12490151678249]
```

---

```
* err= 1.0367747414310802
* Learning rate NN = 0.000478296831715852
* diff = 0.0024810561053427715
```



For scene 15/55

```
* use LR_NN=0.001 with err=9.823748582783283 at it=19
* v0_scn_mean = 31.028489542419443
* MAE = 0.80841803822172
```

---



---

```
- Time interval n.0: [218.16, 218.36]
* y_true: [26.47083003 31.40159485]
* v_ann: [31.401954650878906, 31.341880798339844, 3
```

1.946911515105928]

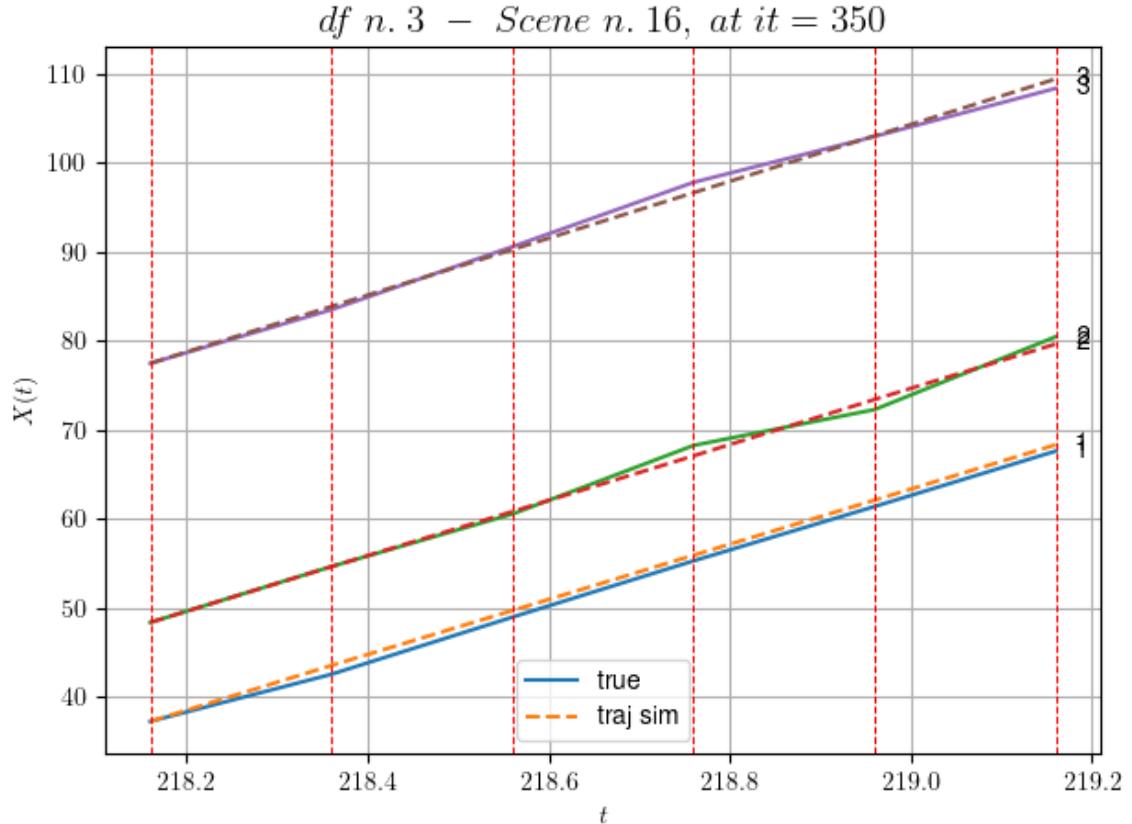
- Time interval n.1: [218.36, 218.56]  
\* y\_true: [32.09751616 29.50187244]  
\* v\_ann: [30.883285522460938, 30.9345645904541, 31.  
946911515105928]

- Time interval n.2: [218.56, 218.76]  
\* y\_true: [31.61167285 38.50305628]  
\* v\_ann: [31.045743942260742, 31.284549713134766, 3  
1.946911515105928]

- Time interval n.3: [218.76, 218.96]  
\* y\_true: [30.522016 20.15190279]  
\* v\_ann: [30.94157600402832, 31.678112030029297, 3  
1.946911515105928]

- Time interval n.4: [218.96, 219.16]  
\* y\_true: [31.13252968 40.9045659 ]  
\* v\_ann: [31.097375869750977, 31.142925262451172, 3  
1.946911515105928]

\* err= 0.5028287727245971  
\* Learning rate NN = 3.874203684972599e-05  
\* diff = 0.00047330712259574526



For scene 16/55

\* use LR\_NN=0.0001 with err=31.260698777664672 at it=19  
 \* v0\_scn\_mean = 31.78004750054028  
 \* MAE = 0.4728173049382369

- 
- 
- Time interval n.0: [222.96, 223.16]
    - \* y\_true: [37.21103813 39.71315438]
    - \* v\_ann: [35.15695571899414, 34.52184295654297, 31.27974144015392]

---

  - Time interval n.1: [223.16, 223.36]
    - \* y\_true: [31.35126998 28.99272163]
    - \* v\_ann: [36.12613296508789, 35.028404235839844, 31.27974144015392]

---

  - Time interval n.2: [223.36, 223.56]
    - \* y\_true: [33.72173898 31.78369531]
    - \* v\_ann: [34.7490234375, 34.088233947753906, 31.27974144015392]

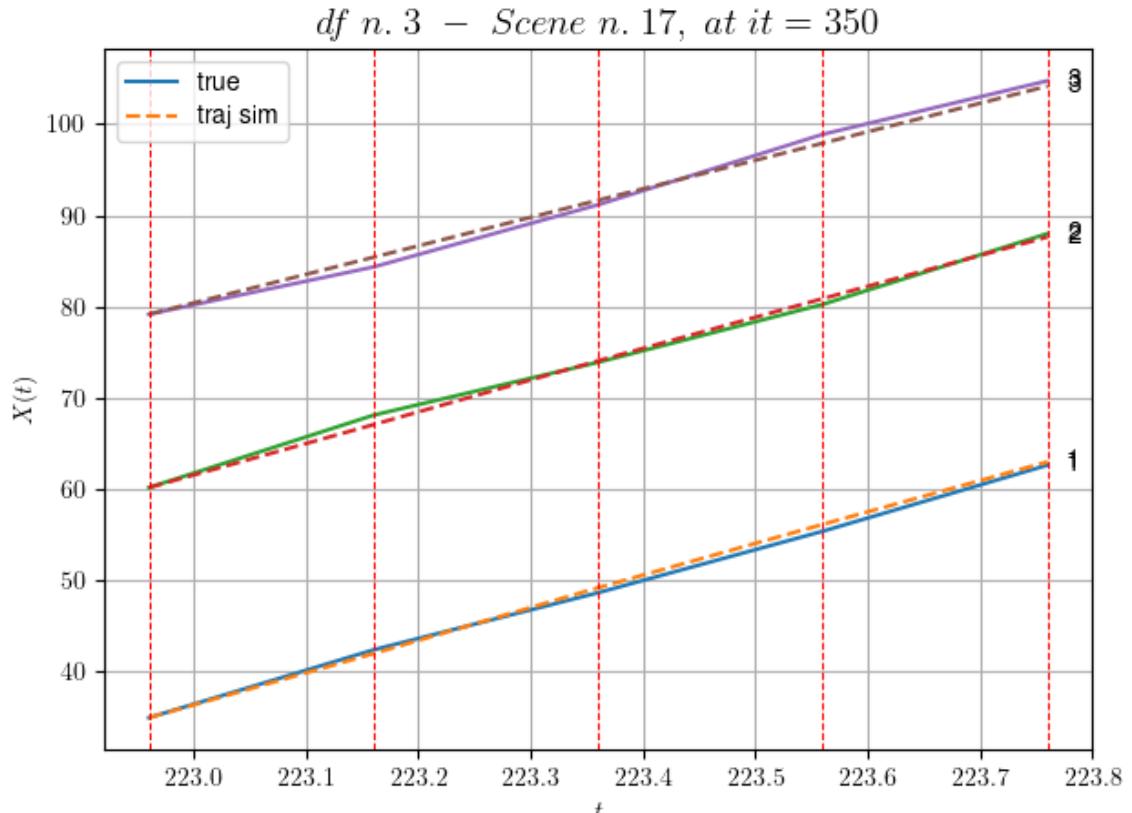
---

  - Time interval n.3: [223.56, 223.76]
    - \* y\_true: [36.23248355 38.79526469]
    - \* v\_ann: [34.30389404296875, 33.81809616088867, 31.27974144015392]

```

* err= 0.3653723037260908
* Learning rate NN = 4.7829678806010634e-05
* diff = 2.8988833413845505e-05

```



For scene 17/55

```

* use LR_NN=0.0001 with err=6.006039156063275 at it=19
* v0_scn_mean = 31.170058594963646
* MAE = 0.3653723037260908

```

- Time interval n.0: [247.36, 247.56]
  - \* y\_true: [24.34113117 25.37248976]
  - \* v\_ann: [29.445419311523438, 26.959312438964844, 29.199550876740787]

---



---

- Time interval n.1: [247.56, 247.76]
  - \* y\_true: [20.86113385 27.00305492]
  - \* v\_ann: [27.4304141998291, 25.751922607421875, 29.199550876740787]

---



---

- Time interval n.2: [247.76, 247.96]
  - \* y\_true: [25.44173909 29.15378269]
  - \* v\_ann: [26.53580665588379, 26.784954071044922, 29.199550876740787]

```

-----  

- Time interval n.3: [247.96, 248.16]  

* y_true: [34.05263307 29.24437105]  

* v_ann: [27.325029373168945, 28.300045013427734, 2  

9.199550876740787]  

-----  

- Time interval n.4: [248.16, 248.36]  

* y_true: [24.6823336 32.34552948]  

* v_ann: [29.029850006103516, 30.233280181884766, 2  

9.199550876740787]  

-----  

- Time interval n.5: [248.36, 248.56]  

* y_true: [29.77329807 35.48696999]  

* v_ann: [29.493730545043945, 30.556568145751953, 2  

9.199550876740787]  

-----  

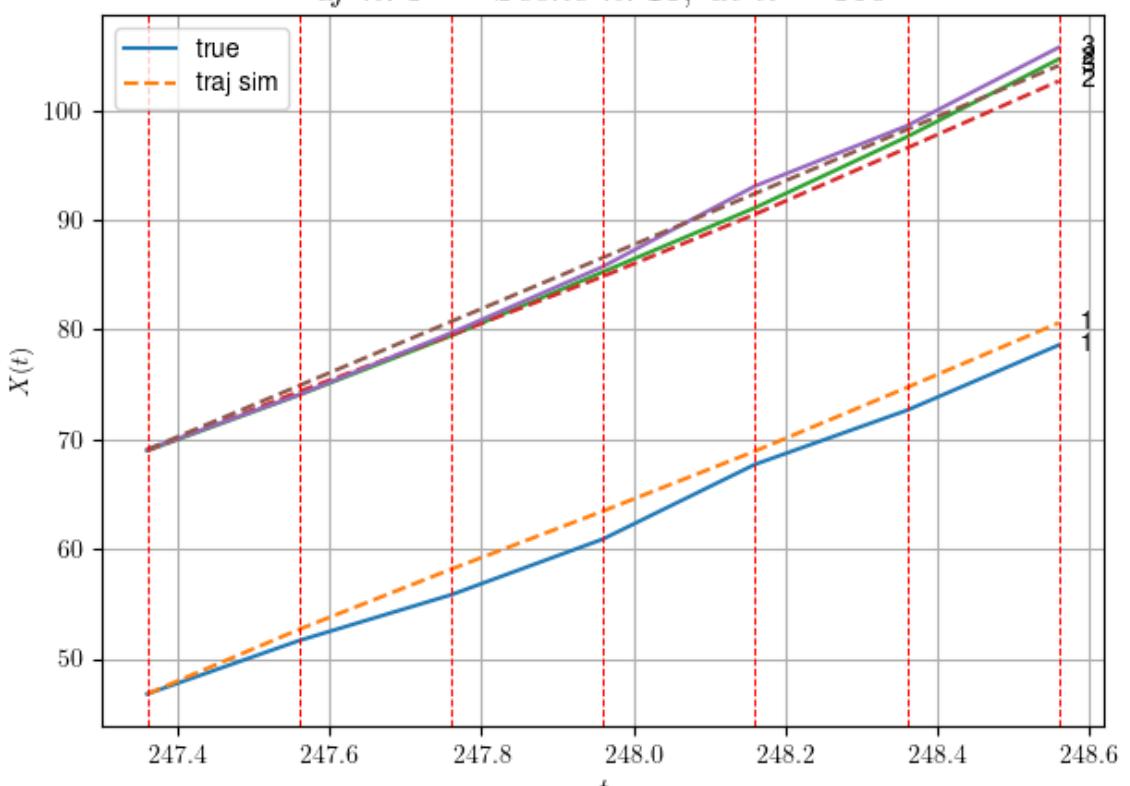
* err= 1.634847334861966  

* Learning rate NN = 0.00031381050939671695  

* diff = 0.0000010161706070121

```

*df n. 3 – Scene n. 18, at it = 350*



For scene 18/55

```

* use LR_NN=0.001 with err=34.07161873036943 at it=19
* v0_scn_mean = 29.26815499825643
* MAE = 1.4230662193970784

```

```
- Time interval n.0: [269.56, 269.76]
 * y_true: [27.75027124 32.18076388]
 * v_ann: [27.89230728149414, 30.466455459594727, 3
0.539171773719296]

-----
- Time interval n.1: [269.76, 269.96]
 * y_true: [33.80053503 32.77104018]
 * v_ann: [28.274188995361328, 29.90233612060547, 3
0.539171773719296]

-----
- Time interval n.2: [269.96, 270.16]
 * y_true: [22.10049768 29.95131945]
 * v_ann: [28.397201538085938, 30.420116424560547, 3
0.539171773719296]

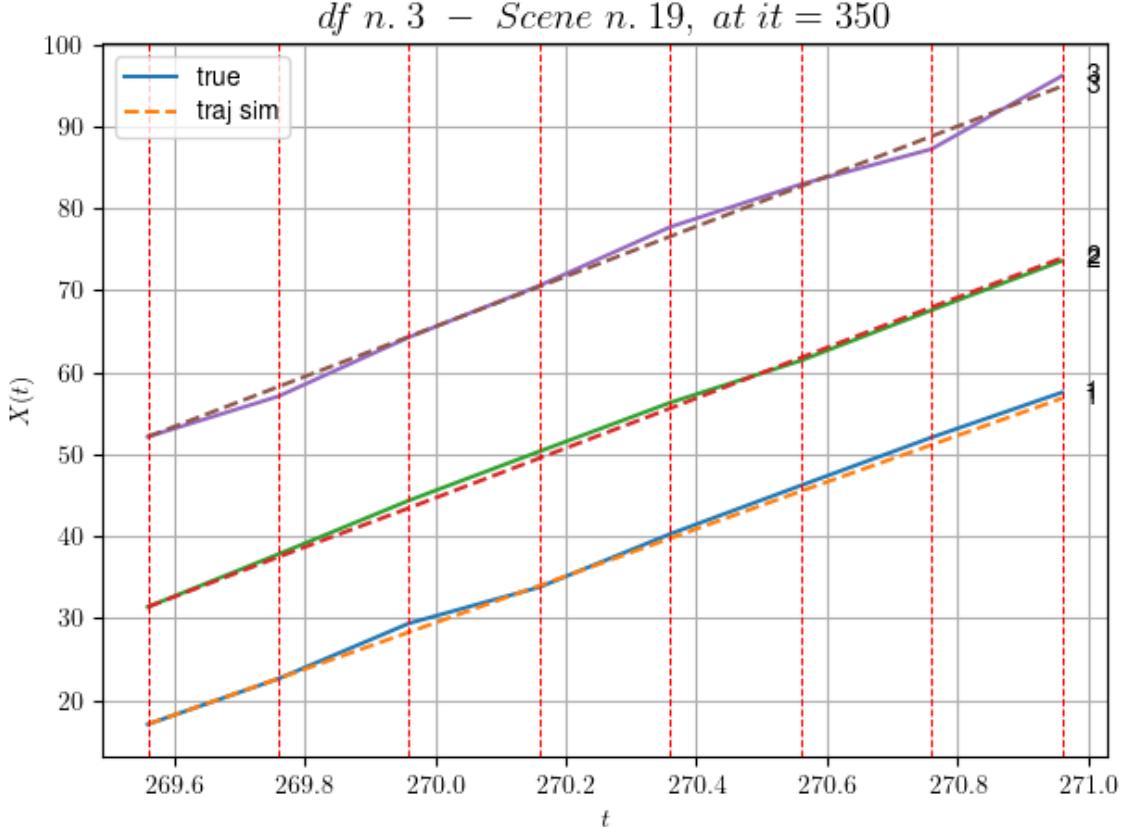
-----
- Time interval n.3: [270.16, 270.36]
 * y_true: [32.40098084 29.70158012]
 * v_ann: [28.85138702392578, 30.328149795532227, 3
0.539171773719296]

-----
- Time interval n.4: [270.36, 270.56]
 * y_true: [29.55119411 25.63174114]
 * v_ann: [28.711528778076172, 30.90654182434082, 3
0.539171773719296]

-----
- Time interval n.5: [270.56, 270.76]
 * y_true: [29.3015063 30.75243246]
 * v_ann: [28.26898765563965, 30.77484703063965, 30.
539171773719296]

-----
- Time interval n.6: [270.76, 270.96]
 * y_true: [27.50174001 30.06304641]
 * v_ann: [28.402816772460938, 30.053913116455078, 3
0.539171773719296]

-----
* err= 0.5266866069543878
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.0033805052042095163
```



For scene 19/55

\* use LR\_NN=0.0001 with err=6.100852659714061 at it=19  
 \* v0\_scn\_mean = 30.49296095930631  
 \* MAE = 0.5266866069543878

---



---

- Time interval n.0: [316.16, 316.36]  
 \* y\_true: [33.9635286 19.3731464]  
 \* v\_ann: [27.179365158081055, 27.25463104248047, 3  
 1.11972321626033]

---



---

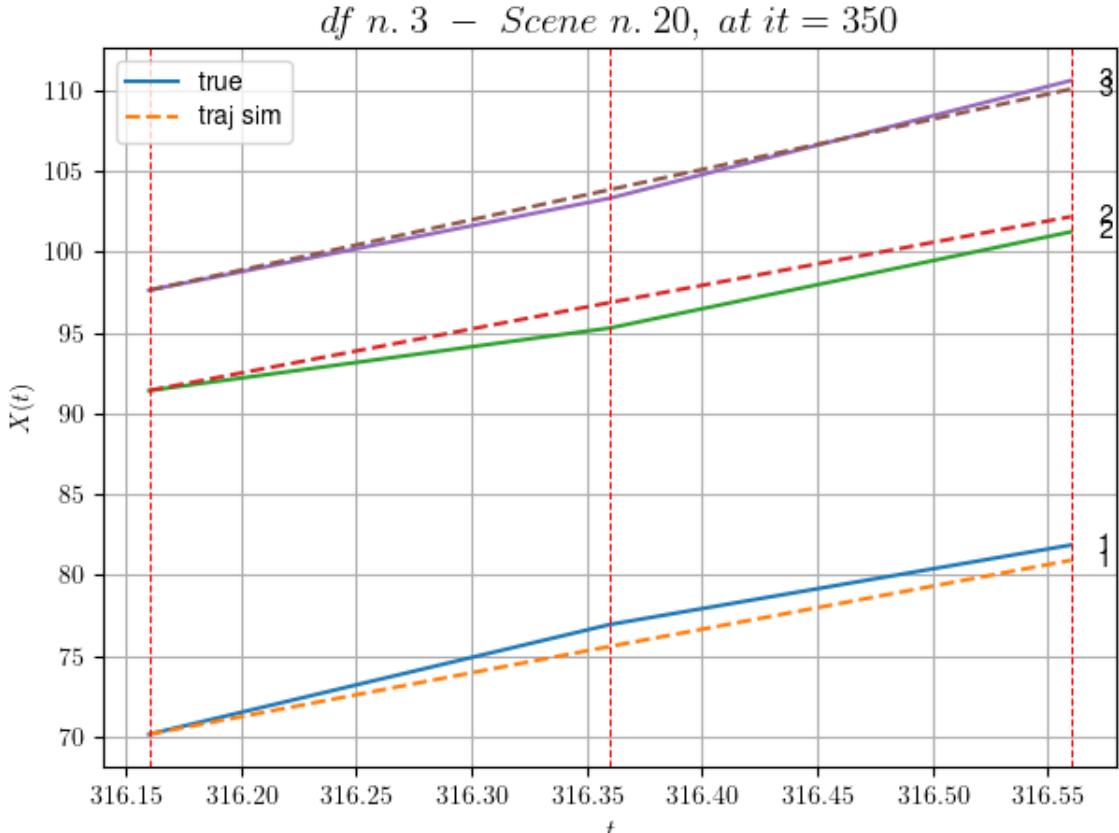
- Time interval n.1: [316.36, 316.56]  
 \* y\_true: [24.60296417 29.75560281]  
 \* v\_ann: [26.659238815307617, 26.566057205200195, 3  
 1.11972321626033]

---



---

\* err= 0.7399705147194581  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 8.204162098746082e-05



For scene 20/55

```
* use LR_NN=0.0005 with err=3.154545088965621 at it=19
* v0_scn_mean = 31.023755058685005
* MAE = 0.7130865791627418
```

---



---

```
- Time interval n.0: [317.76, 317.96]
* y_true: [22.24301013 28.10582296]
* v_ann: [29.38483238220215, 27.15981674194336, 28.
729615682184654]
```

---

```
- Time interval n.1: [317.96, 318.16]
* y_true: [28.26433817 33.10585656]
* v_ann: [27.635560989379883, 29.956056594848633, 2
8.729615682184654]
```

---

```
- Time interval n.2: [318.16, 318.36]
* y_true: [11.28182915 18.67354228]
* v_ann: [31.757261276245117, 15.090805053710938, 2
8.729615682184654]
```

---

```
- Time interval n.3: [318.36, 318.56]
* y_true: [28.12514655 32.86712293]
* v_ann: [18.129560470581055, 17.063568115234375, 2
```

8.729615682184654]

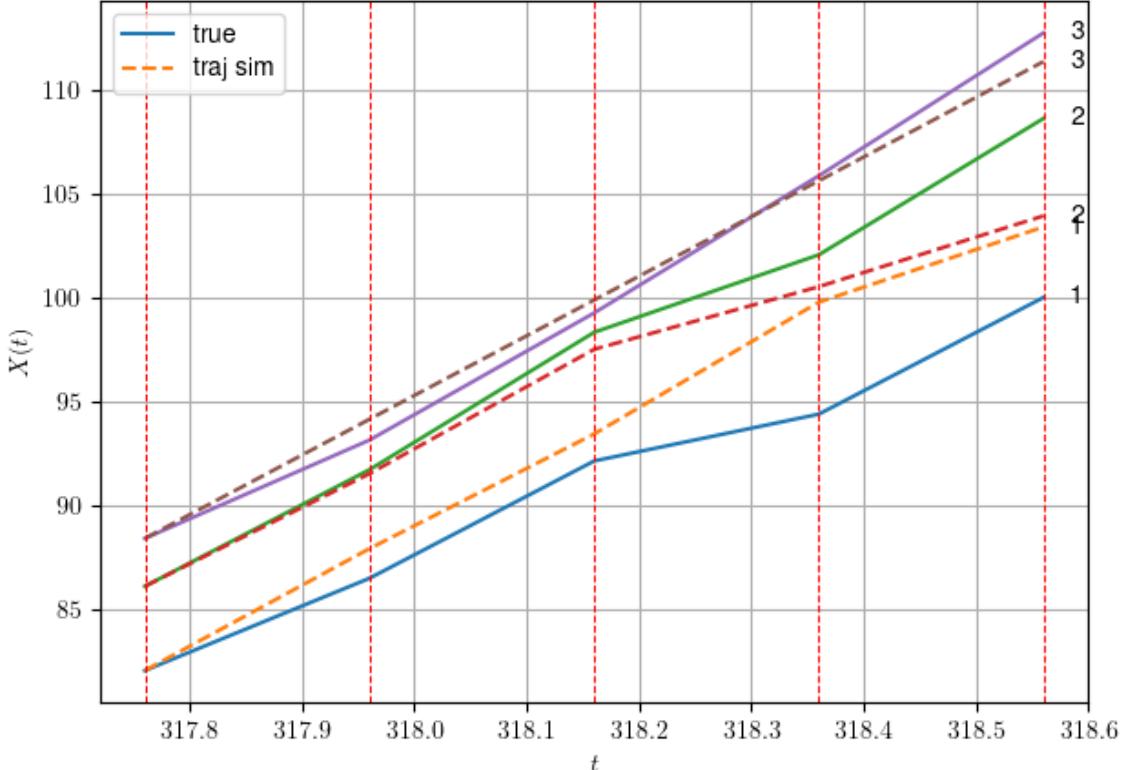
---



---

- \* err= 4.8606252466335205
- \* Learning rate NN = 0.002391484100371599
- \* diff = 0.00597183691998282

*df n. 3 – Scene n. 21, at it = 350*



For scene 21/55

- \* use LR\_NN=0.005 with err=20.23600493302323 at it=19
- \* v0\_scn\_mean = 28.838496556157494
- \* MAE = 2.9867845806004296

- 
- 
- Time interval n.0: [325.76, 325.96]
    - \* y\_true: [25.31057708 30.22149101]
    - \* v\_ann: [25.674314498901367, 27.491853713989258, 3.135529650132405]
  
  - Time interval n.1: [325.96, 326.16]
    - \* y\_true: [25.23074384 33.46208613]
    - \* v\_ann: [25.85146141052246, 27.59892463684082, 33.135529650132405]
  
  - Time interval n.2: [326.16, 326.36]
    - \* y\_true: [24.63092838 29.01218385]
    - \* v\_ann: [26.2441349029541, 28.04631996154785, 33.135529650132405]

```

-----  

    - Time interval n.3: [326.36, 326.56]  

      * y_true: [17.72077879 27.33248549]  

      * v_ann: [26.3011474609375, 28.118925094604492, 33.  

135529650132405]

```

```

-----  

    - Time interval n.4: [326.56, 326.76]  

      * y_true: [25.71142574 30.60327071]  

      * v_ann: [26.00432777404785, 27.360240936279297, 3  

3.135529650132405]

```

```

-----  

    - Time interval n.5: [326.76, 326.96]  

      * y_true: [31.6120671 24.79299826]  

      * v_ann: [26.257362365722656, 27.620986938476562, 3  

3.135529650132405]

```

```

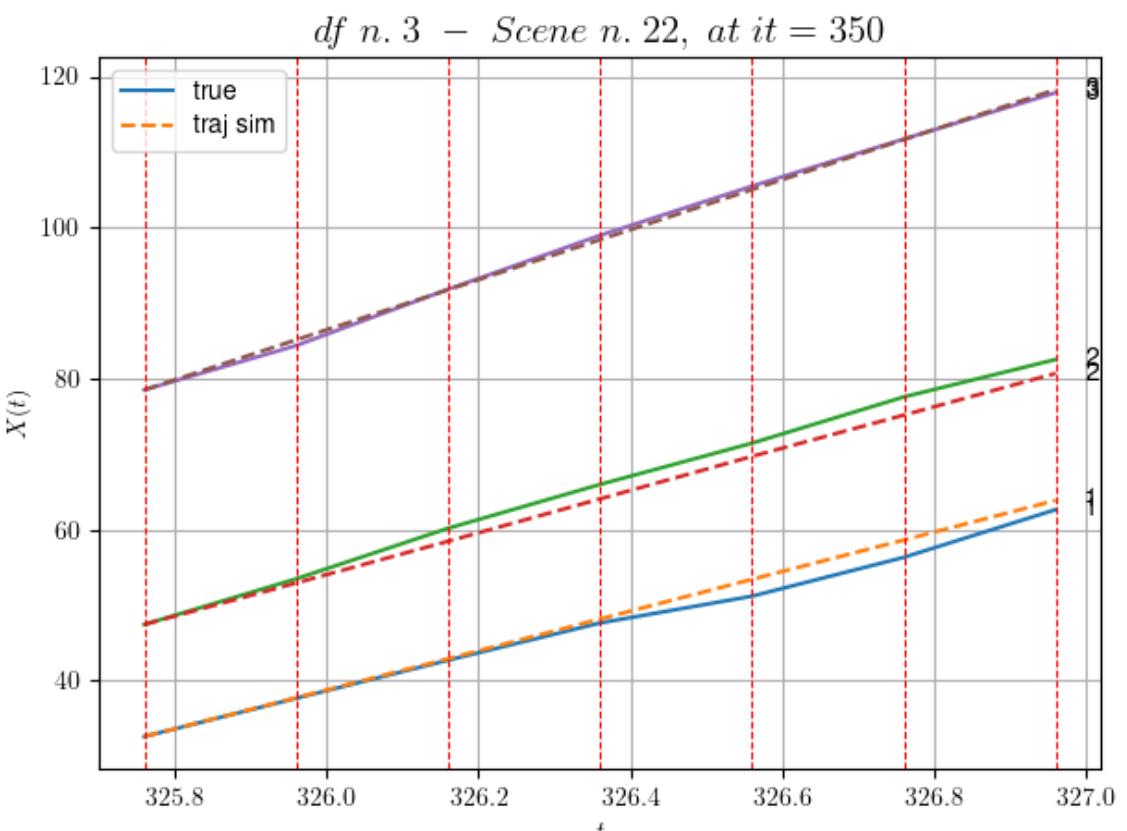
-----  

* err= 1.5483301003300183  

* Learning rate NN = 1.5690524378442205e-05  

* diff = 0.013054236088032578

```



For scene 22/55

```

* use LR_NN=5e-05 with err=11.649947661440473 at it=19
* v0_scn_mean = 32.86679269873441
* MAE = 0.8068691122118778

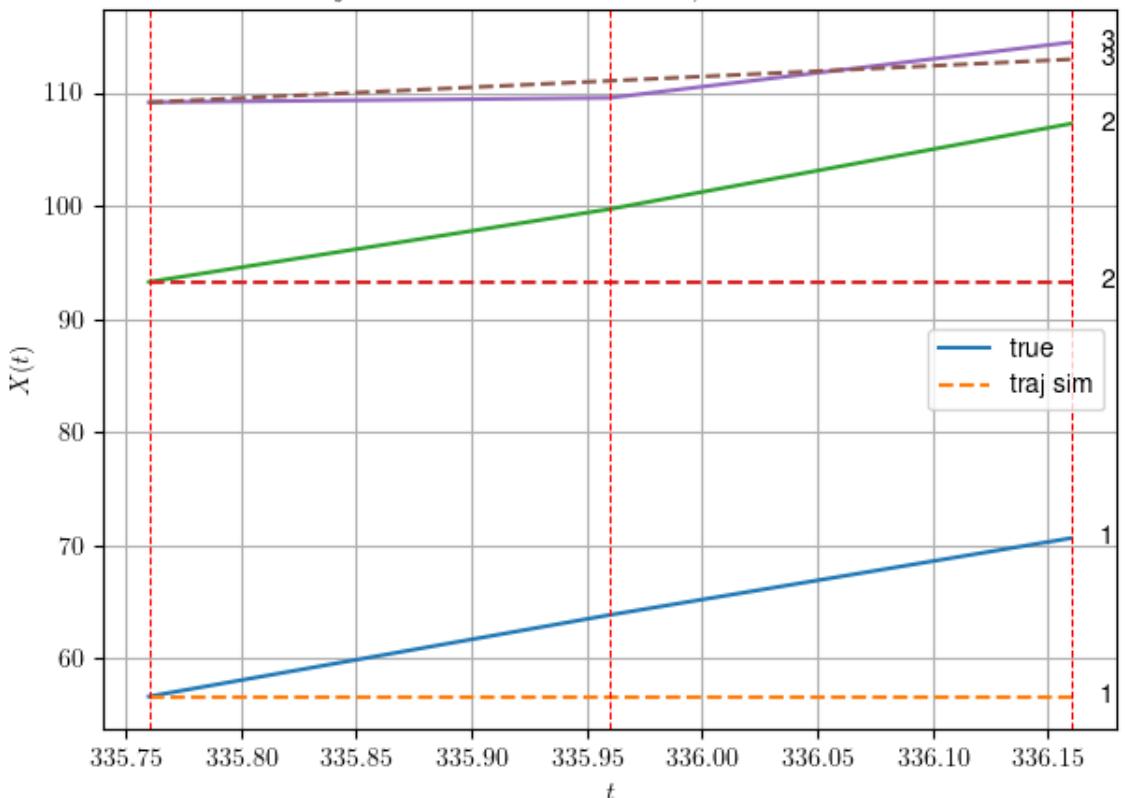
```

```
=====
- Time interval n.0: [335.76, 335.96]
  * y_true: [36.00253797 32.17585284]
  * v_ann: [1.6919425635375674e-36, 1.412315038274445
2e-14, 9.495828685169489]
```

```
=====
- Time interval n.1: [335.96, 336.16]
  * y_true: [33.90297107 37.71766361]
  * v_ann: [1.0889268400591404e-35, 3.375516044457072
e-08, 9.495828685169489]
```

```
=====
* err= 54.293358694448536
* Learning rate NN = 0.00036449998151510954
* diff = 3.510020101620106e-06
```

*df n. 3 – Scene n. 23, at it = 350*



For scene 23/55

```
* use LR_NN=0.0005 with err=17.1173717603529 at it=19
* v0_scn_mean = 11.253180426321
* MAE = 12.79050534111922
```

=====

=====

For scene 24/55

```
* use LR_NN=0.0005 with err=7.638072897937707 at it=19
* v0_scn_mean = 32.315435713930356
* MAE = 68.51253873070232
```

```
=====
=====

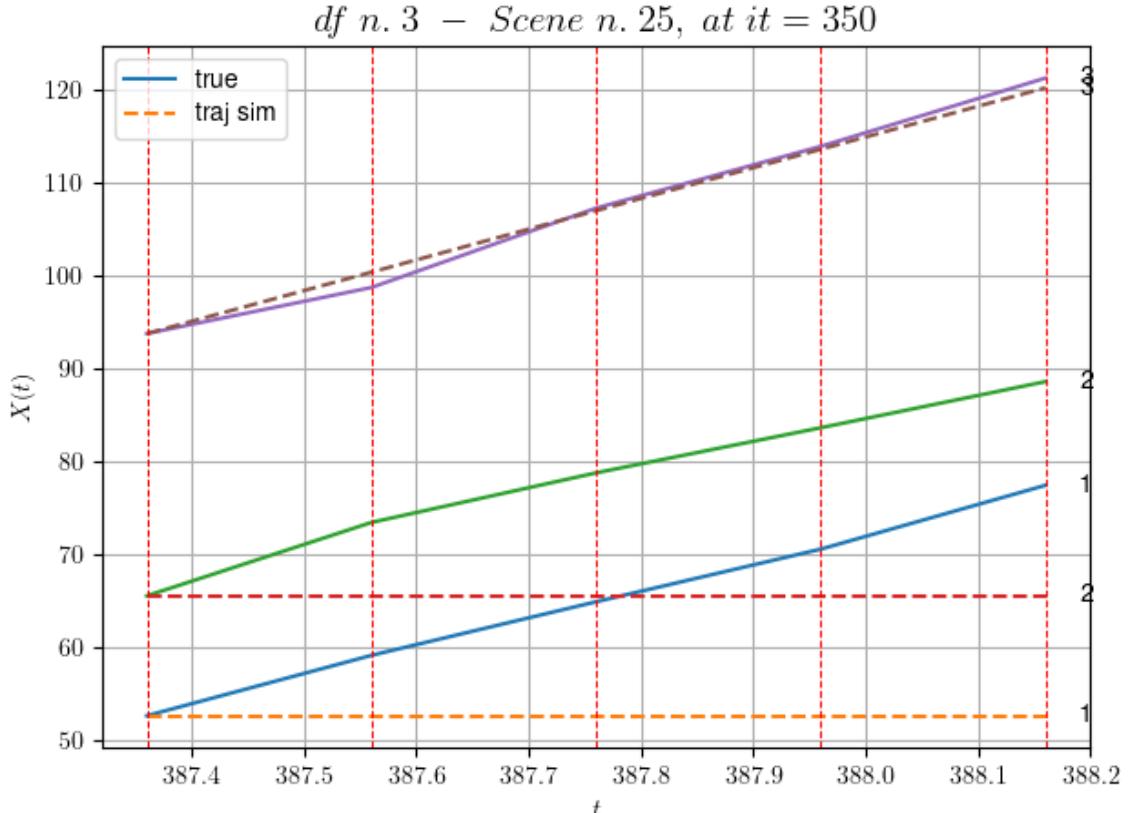
    - Time interval n.0: [387.36, 387.56]
      * y_true: [32.47194771 39.46360823]
      * v_ann: [1.9316246518963354e-11, 1.31540745571456e
-27, 33.03187618027038]

-----
    - Time interval n.1: [387.56, 387.76]
      * y_true: [28.80212467 26.65295039]
      * v_ann: [6.434708993939553e-13, 1.6468935719543938
e-24, 33.03187618027038]

-----
    - Time interval n.2: [387.76, 387.96]
      * y_true: [28.30253286 24.25305315]
      * v_ann: [1.830911290634507e-12, 6.8317453655779e-2
8, 33.03187618027038]

-----
    - Time interval n.3: [387.96, 388.16]
      * y_true: [34.31356051 24.78356316]
      * v_ann: [1.3132672033178139e-11, 8.756345064134017
e-30, 33.03187618027038]

-----
* err= 148.36560739267435
* Learning rate NN = 0.000239148415857926
* diff = 8.519141942997521e-07
```



For scene 25/55

- \* use LR\_NN=0.0005 with err=15.986962737328701 at it=19
- \* v0\_scn\_mean = 32.77202306050534
- \* MAE = 148.36560739267435

---



---

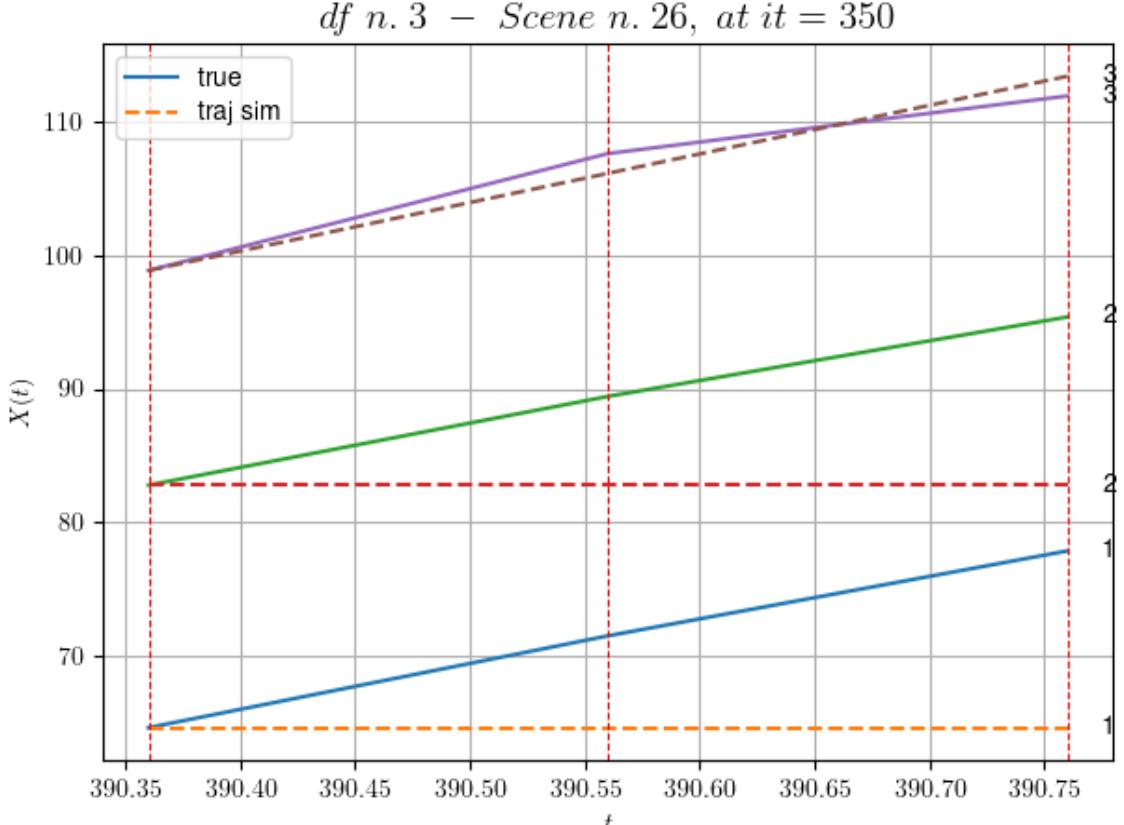
- Time interval n.0: [390.36, 390.56]
- \* y\_true: [34.37306474 33.21473815]
- \* v\_ann: [5.325248162912258e-17, 8.462129346580635e-15, 36.35421452147256]

---

- Time interval n.1: [390.56, 390.76]
- \* y\_true: [31.79338609 29.7348149 ]
- \* v\_ann: [9.356231967653416e-17, 5.029395767176337e-17, 36.35421452147256]

---

- \* err= 47.70993068591407
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 1.0834298080908411e-06



For scene 26/55

- \* use LR\_NN=0.0001 with err=1.0581486439763468 at it=19
- \* v0\_scn\_mean = 35.809613631169675
- \* MAE = 47.66132784125852

---



---

- Time interval n.0: [427.96, 428.16]
  - \* y\_true: [33.16108667 24.70091575]
  - \* v\_ann: [26.337745666503906, 2.8627004944001506e-2, 37.349803066652754]
  
- Time interval n.1: [428.16, 428.36]
  - \* y\_true: [36.08159054 35.68166414]
  - \* v\_ann: [39.290428161621094, 1.1548574975915505e-2, 37.349803066652754]
  
- Time interval n.2: [428.36, 428.56]
  - \* y\_true: [27.64533545 36.4184567 ]
  - \* v\_ann: [36.953495025634766, 1.538135665812766e-2, 37.349803066652754]
  
- Time interval n.3: [428.56, 428.76]
  - \* y\_true: [24.96174823 38.17283814]
  - \* v\_ann: [26.49464225769043, 1.1504436630546579e-2, 37.349803066652754]

3, 37.349803066652754]

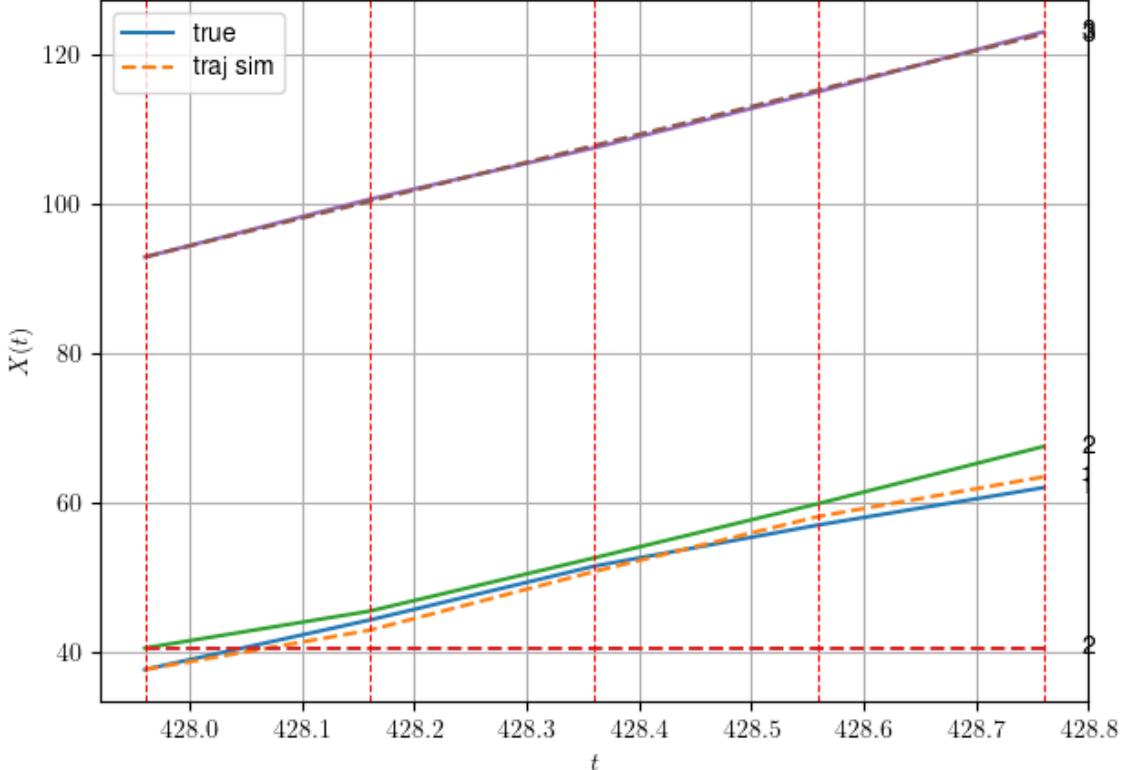
---



---

- \* err= 85.32521364760635
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 0.006870322471897339

*df n. 3 – Scene n. 27, at it = 350*



For scene 27/55

- \* use LR\_NN=5e-05 with err=75.50540221542354 at it=19
- \* v0\_scn\_mean = 36.719873233450066
- \* MAE = 85.32521364760635

---



---

- Time interval n.0: [439.36, 439.56]
  - \* y\_true: [29.12388438 22.06331107]
  - \* v\_ann: [23.89521026611328, 23.781688690185547, 3.536353019452505]

---



---

- Time interval n.1: [439.56, 439.76]
  - \* y\_true: [38.07606081 22.99369197]
  - \* v\_ann: [22.499935150146484, 26.993776321411133, 3.536353019452505]

---



---

- Time interval n.2: [439.76, 439.96]
  - \* y\_true: [23.98424021 18.65338098]
  - \* v\_ann: [27.71940040588379, 29.04922103881836, 33.536353019452505]

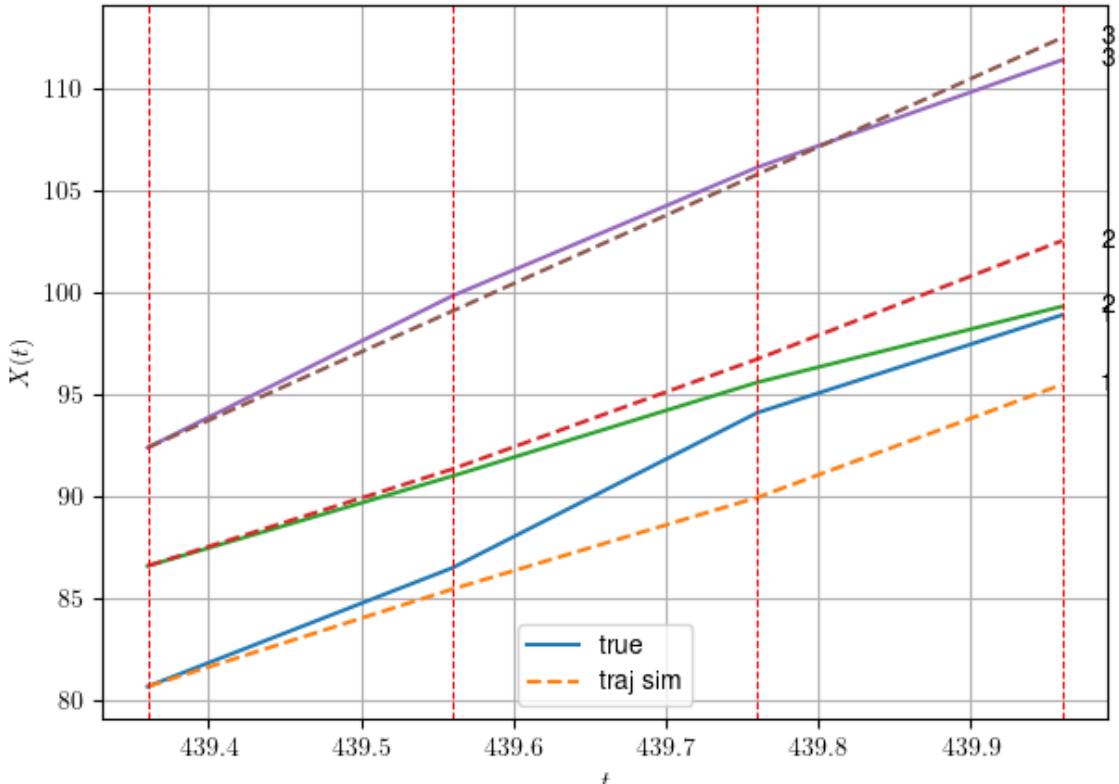
---



---

```
* err= 3.645326112401943
* Learning rate NN = 5.904899080633186e-05
* diff = 0.002433508297053244
```

*df n. 3 – Scene n. 28, at it = 350*



For scene 28/55

```
* use LR_NN=0.0001 with err=13.717467615668438 at it=19
* v0_scn_mean = 33.2332626852644
* MAE = 1.7954067331741614
```

---



---

- Time interval n.0: [448.36, 448.56]  
 \* y\_true: [32.70350359 27.85524745]  
 \* v\_ann: [34.66340255737305, 29.79970359802246, 31.  
 585036733085307]

---



---

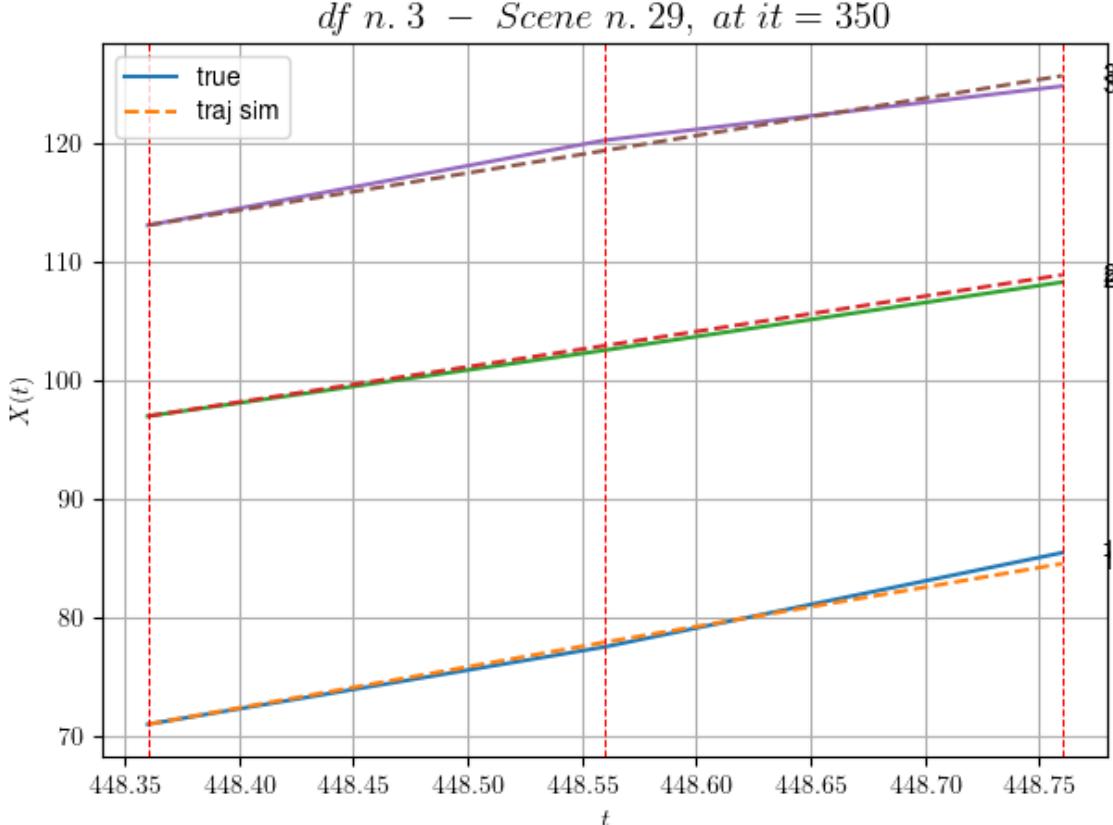
- Time interval n.1: [448.56, 448.76]  
 \* y\_true: [39.76511656 28.75604876]  
 \* v\_ann: [33.18906784057617, 29.874691009521484, 3  
 1.585036733085307]

---



---

```
* err= 0.3403615081544751
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0026254933993674068
```



For scene 29/55

\* use LR\_NN=0.0001 with err=0.6339277382405316 at it=19  
 \* v0\_scn\_mean = 31.449187933349833  
 \* MAE = 0.2366781697700814

---



---

- Time interval n.0: [465.16, 465.36]  
 \* y\_true: [25.95020905 30.0319773 ]  
 \* v\_ann: [26.771961212158203, 24.953413009643555, 2  
 4.72211720249953]

---

- Time interval n.1: [465.36, 465.56]  
 \* y\_true: [21.30025919 28.782318 ]  
 \* v\_ann: [26.902318954467773, 24.92777442932129, 2  
 4.72211720249953]

---

- Time interval n.2: [465.56, 465.76]  
 \* y\_true: [22.00036741 28.59272475]  
 \* v\_ann: [27.002811431884766, 24.98866844177246, 2  
 4.72211720249953]

---

- Time interval n.3: [465.76, 465.96]  
 \* y\_true: [26.90061063 23.70259195]  
 \* v\_ann: [27.088335037231445, 24.835676193237305, 2

4.72211720249953]

```
- Time interval n.4: [465.96, 466.16]
  * y_true: [23.75070885 23.26288454]
  * v_ann: [26.992155075073242, 24.646480560302734, 2
```

4.72211720249953]

```
- Time interval n.5: [466.16, 466.36]
  * y_true: [28.05107156 31.61450449]
  * v_ann: [26.892433166503906, 24.489212036132812, 2
```

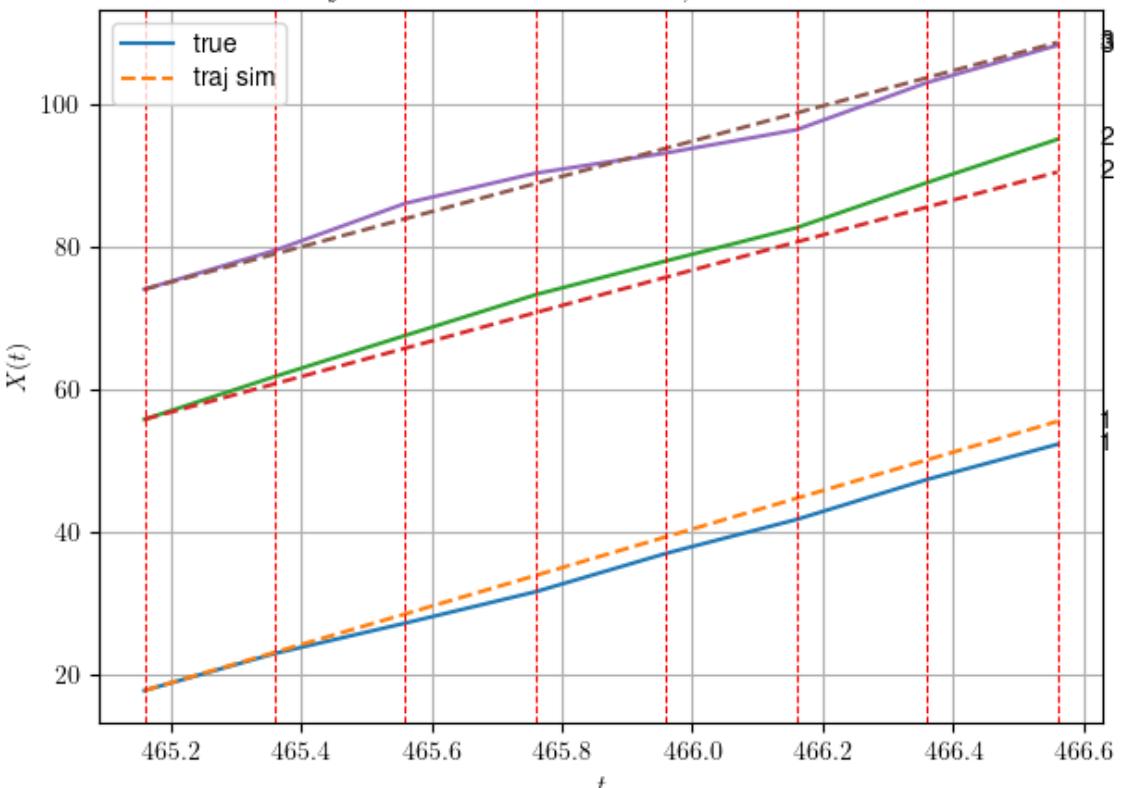
4.72211720249953]

```
- Time interval n.6: [466.36, 466.56]
  * y_true: [24.65117633 30.37492519]
  * v_ann: [27.068092346191406, 24.554462432861328, 2
```

4.72211720249953]

```
* err= 4.384314834352741
* Learning rate NN = 2.541864660088322e-06
* diff = 0 0153793215249447
```

df n. 3 – Scene n. 30, at it = 350



For scene 30/55

```
* use LR_NN=1e-05 with err=68.66418769646317 at it=19
* v0_scn_mean = 25.174468891400537
* MAE = 4.384314834352741
```

```
=====
- Time interval n.0: [467.16, 467.36]
  * y_true: [14.52040439 29.14139959]
  * v_ann: [17.561065673828125, 21.375205993652344, 2
0.776329501781795]

-----
- Time interval n.1: [467.36, 467.56]
  * y_true: [ 8.96028804 21.01119683]
  * v_ann: [18.906896591186523, 20.655811309814453, 2
0.776329501781795]

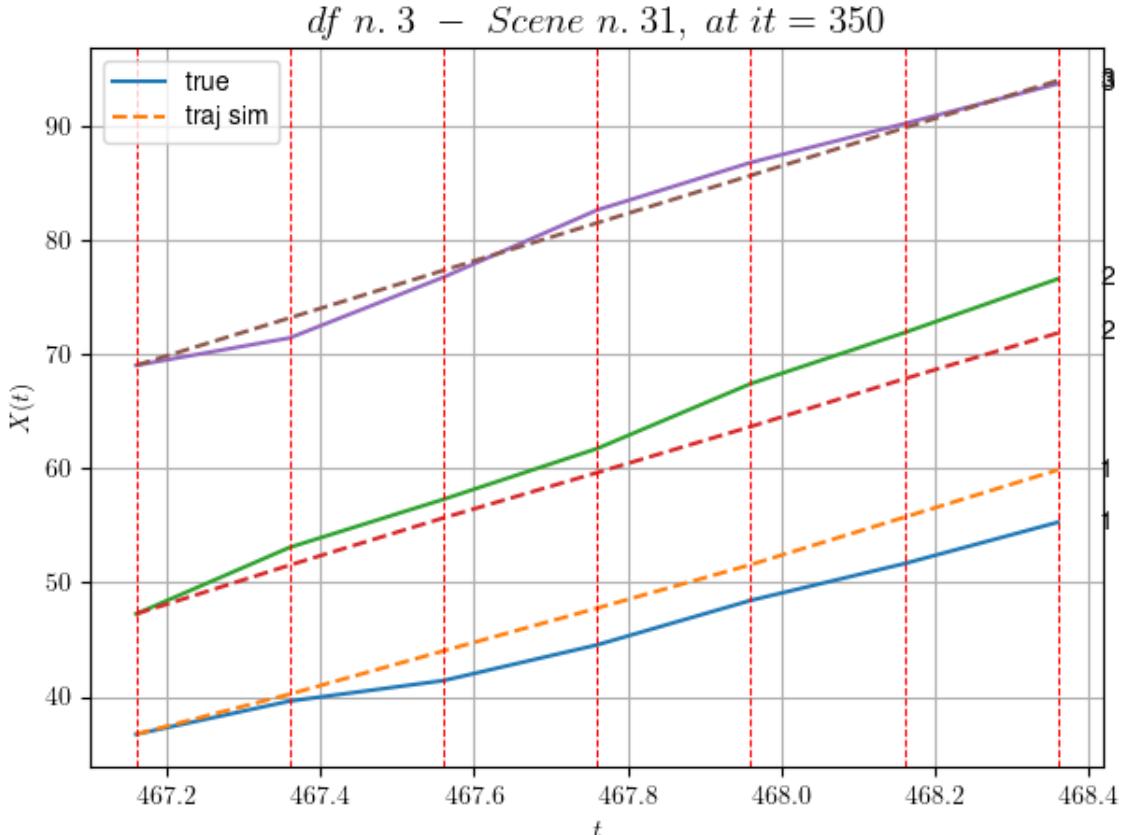
-----
- Time interval n.2: [467.56, 467.76]
  * y_true: [15.62056342 22.22157858]
  * v_ann: [18.72055435180664, 19.81622314453125, 20.
776329501781795]

-----
- Time interval n.3: [467.76, 467.96]
  * y_true: [19.48080782 28.40220095]
  * v_ann: [19.03072738647461, 20.145299911499023, 2
0.776329501781795]

-----
- Time interval n.4: [467.96, 468.16]
  * y_true: [16.10078185 22.34213456]
  * v_ann: [20.77134132385254, 20.909503936767578, 2
0.776329501781795]

-----
- Time interval n.5: [468.16, 468.36]
  * y_true: [18.12099432 23.56241547]
  * v_ann: [20.720670700073242, 20.07721519470215, 2
0.776329501781795]

-----
* err= 6.350325211586369
* Learning rate NN = 0.00015690525469835848
* diff = 0.01330364568076714
```



For scene 31/55

\* use LR\_NN=0.0005 with err=16.09868863762424 at it=19  
 \* v0\_scn\_mean = 21.566862957680094  
 \* MAE = 5.993738583307035

---



---

- Time interval n.0: [480.76, 480.96]  
 \* y\_true: [26.72145209 13.04113053]  
 \* v\_ann: [17.50477409362793, 18.424867630004883, 1  
 8.304926244695185]

---

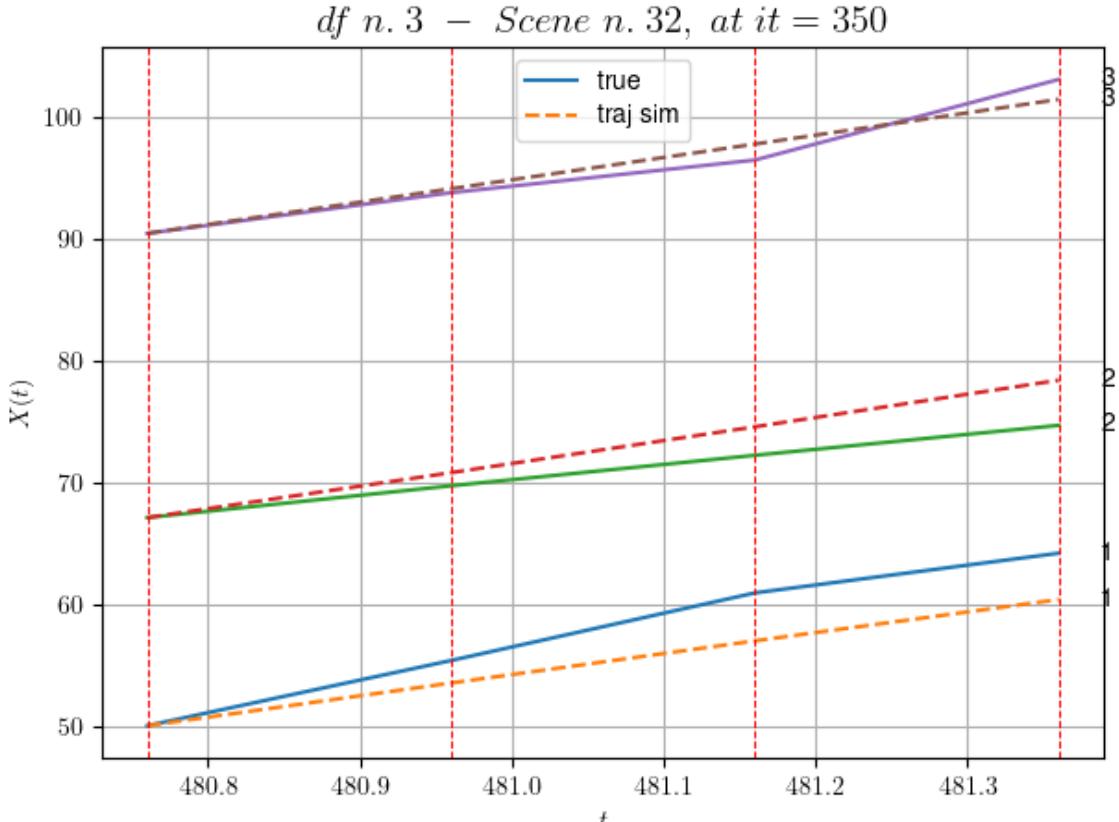
- Time interval n.1: [480.96, 481.16]  
 \* y\_true: [27.70182882 12.50117676]  
 \* v\_ann: [17.27047348022461, 18.796613693237305, 1  
 8.304926244695185]

---

- Time interval n.2: [481.16, 481.36]  
 \* y\_true: [16.26121495 12.26123448]  
 \* v\_ann: [16.930652618408203, 19.086841583251953, 1  
 8.304926244695185]

---

\* err= 4.837835172888276  
 \* Learning rate NN = 5.904899080633186e-05  
 \* diff = 0.005229727186584654



For scene 32/55

- \* use LR\_NN=0.0001 with err=15.701742332274941 at it=19
- \* v0\_scn\_mean = 19.30727634756975
- \* MAE = 4.837835172888276

---



---

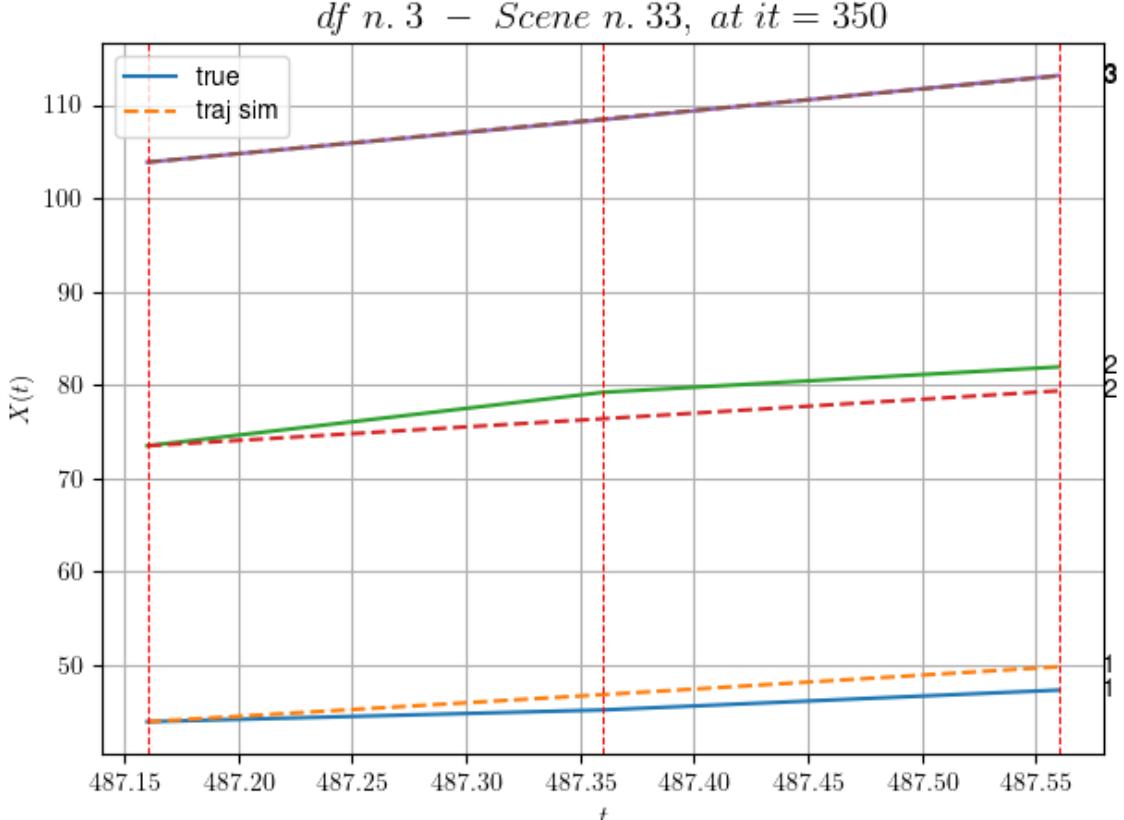
- Time interval n.0: [487.16, 487.36]
- \* y\_true: [ 6.3002445 28.62315801]
- \* v\_ann: [14.497360229492188, 14.4862642288208, 23.071881683468334]

---

- Time interval n.1: [487.36, 487.56]
- \* y\_true: [10.63044184 13.60161023]
- \* v\_ann: [14.931771278381348, 14.929893493652344, 23.071881683468334]

---

- \* err= 2.6111862717335304
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 5.8871215517619646e-05



For scene 33/55

- \* use LR\_NN=5e-05 with err=3.8881051925170524 at it=19
- \* v0\_scn\_mean = 23.665670166773214
- \* MAE = 2.6111862717335304

---



---

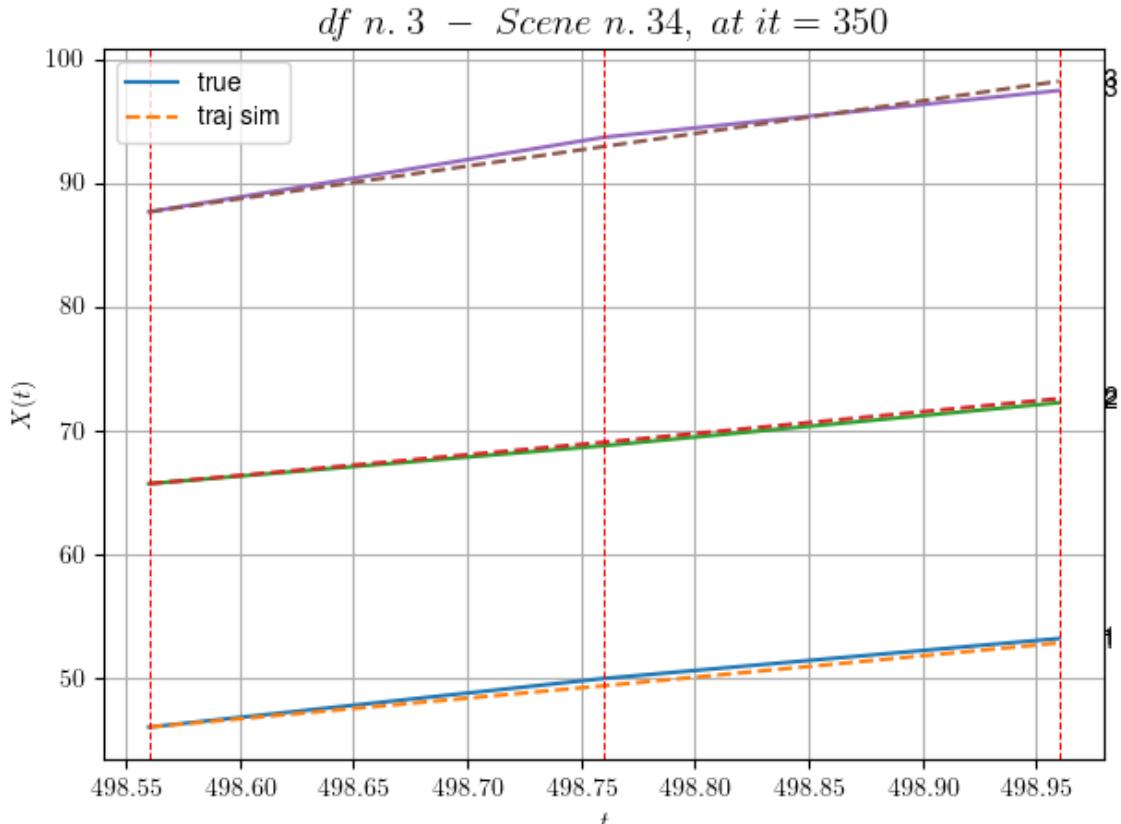
- Time interval n.0: [498.56, 498.76]
- \* y\_true: [19.66086018 15.38134444]
- \* v\_ann: [16.72035789489746, 16.7758731842041, 26.404288947134464]

---

- Time interval n.1: [498.76, 498.96]
- \* y\_true: [16.17082592 17.38167269]
- \* v\_ann: [17.323192596435547, 17.65284538269043, 26.404288947134464]

---

- \* err= 0.19864737194461365
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00018474638267673704



For scene 34/55

\* use LR\_NN=0.0005 with err=0.8391283892469974 at it=19

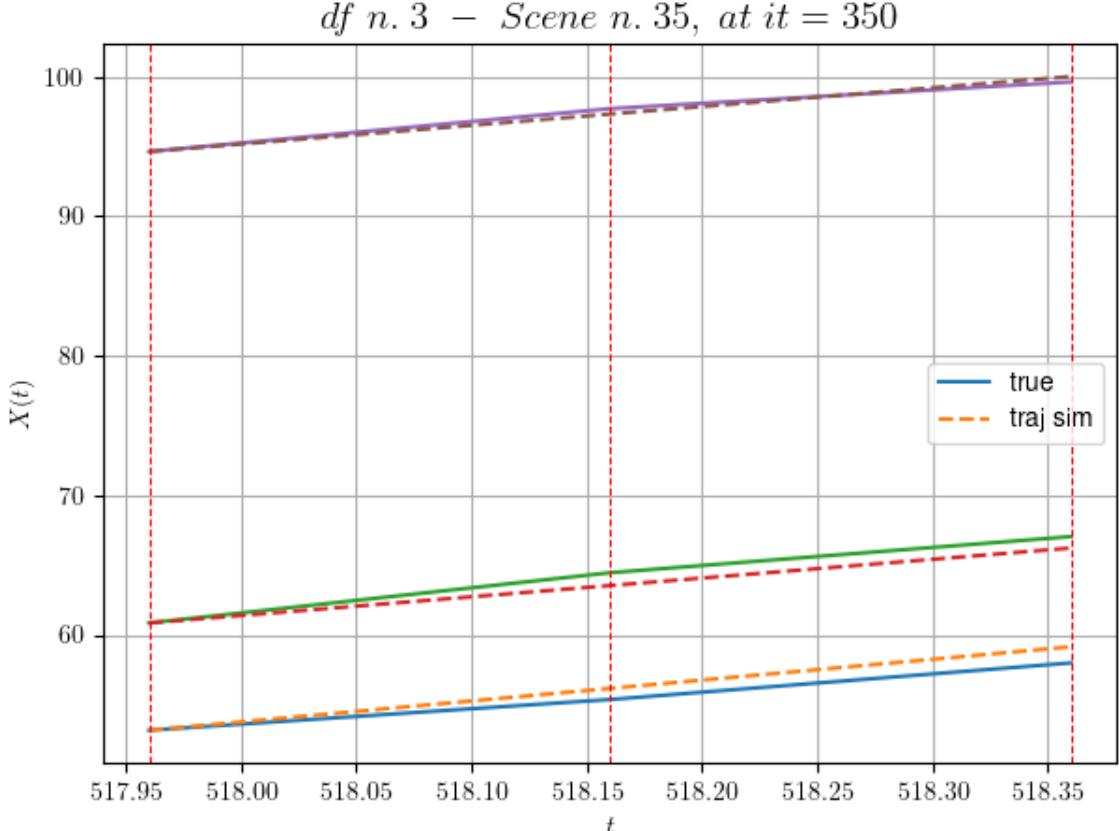
\* v0\_scn\_mean = 26.71246668240703

\* MAE = 0.19864737194461365

- Time interval n.0: [517.96, 518.16]  
 \* y\_true: [11.01062169 17.99135838]  
 \* v\_ann: [14.983441352844238, 13.396964073181152, 1  
 3.435858379545238]

- Time interval n.1: [518.16, 518.36]  
 \* y\_true: [13.11081201 12.94110202]  
 \* v\_ann: [14.9039945602417, 13.447794914245605, 13.  
 435858379545238]

\* err= 0.4193421852762782  
 \* Learning rate NN = 7.289998848136747e-06  
 \* diff = 0.001421353874263398



For scene 35/55

\* use LR\_NN=1e-05 with err=7.59341093124601 at it=19  
 \* v0\_scn\_mean = 14.855521855353018  
 \* MAE = 0.4193421852762782

- 
- 
- Time interval n.0: [527.36, 527.56]
    - \* y\_true: [14.45064103 23.0016556 ]
    - \* v\_ann: [16.711200714111328, 16.79332160949707, 1
    - 6.92100053011327]

---

  - Time interval n.1: [527.56, 527.76]
    - \* y\_true: [16.14079976 10.04077962]
    - \* v\_ann: [16.95952796936035, 16.80193519592285, 16.
    - 92100053011327]

---

  - Time interval n.2: [527.76, 527.96]
    - \* y\_true: [12.25068777 19.3317022 ]
    - \* v\_ann: [16.66515350341797, 16.640750885009766, 1
    - 6.92100053011327]

---

  - Time interval n.3: [527.96, 528.16]
    - \* y\_true: [17.36107311 21.34208771]
    - \* v\_ann: [16.738527297973633, 16.618745803833008, 1

6.92100053011327]

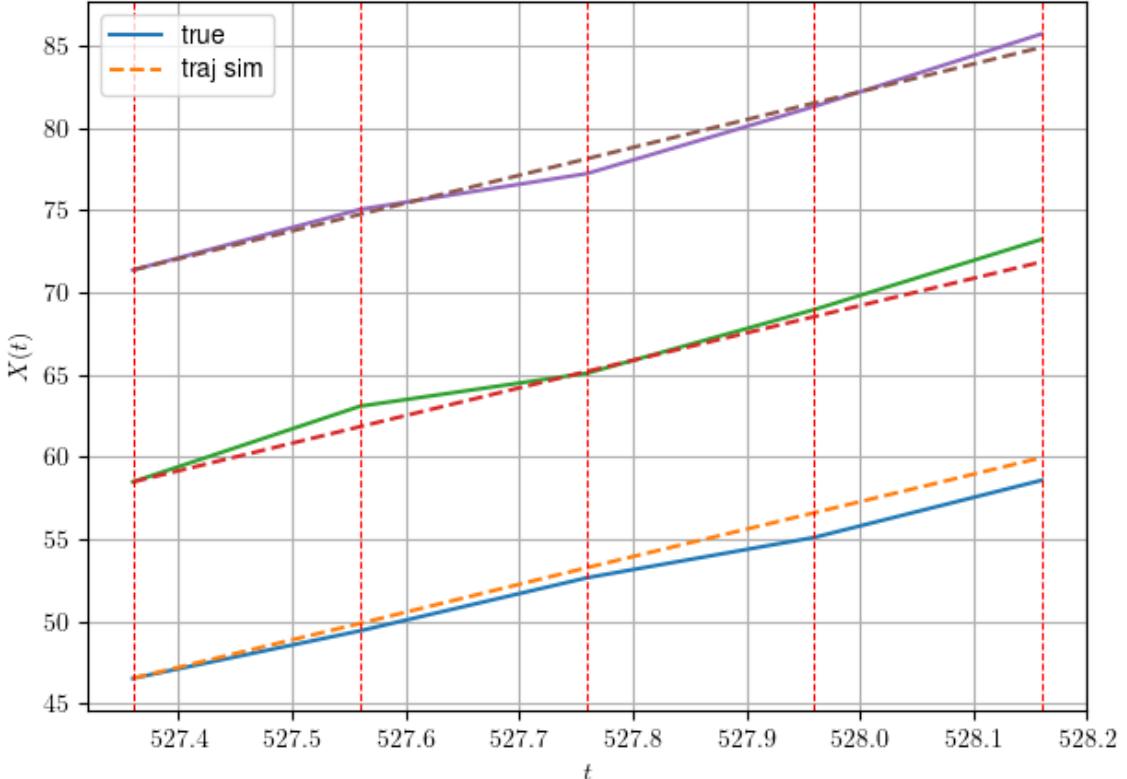
---



---

- \* err= 0.6636135988536321
- \* Learning rate NN = 4.7829678806010634e-05
- \* diff = 2.2169399064853046e-05

*df n. 3 – Scene n. 36, at it = 350*



For scene 36/55

- \* use LR\_NN=0.0001 with err=14.106059263637542 at it=19
- \* v0\_scn\_mean = 18.04196280349677
- \* MAE = 0.6634034073074896

---



---

- Time interval n.0: [530.36, 530.56]
- \* y\_true: [16.07060164 26.13260896]
- \* v\_ann: [20.37786102294922, 19.054393768310547, 1

8.05494146639523]

---



---

- Time interval n.1: [530.56, 530.76]
- \* y\_true: [15.14064363 18.85215172]
- \* v\_ann: [22.0211238861084, 19.62624168395996, 18.0

5494146639523]

---



---

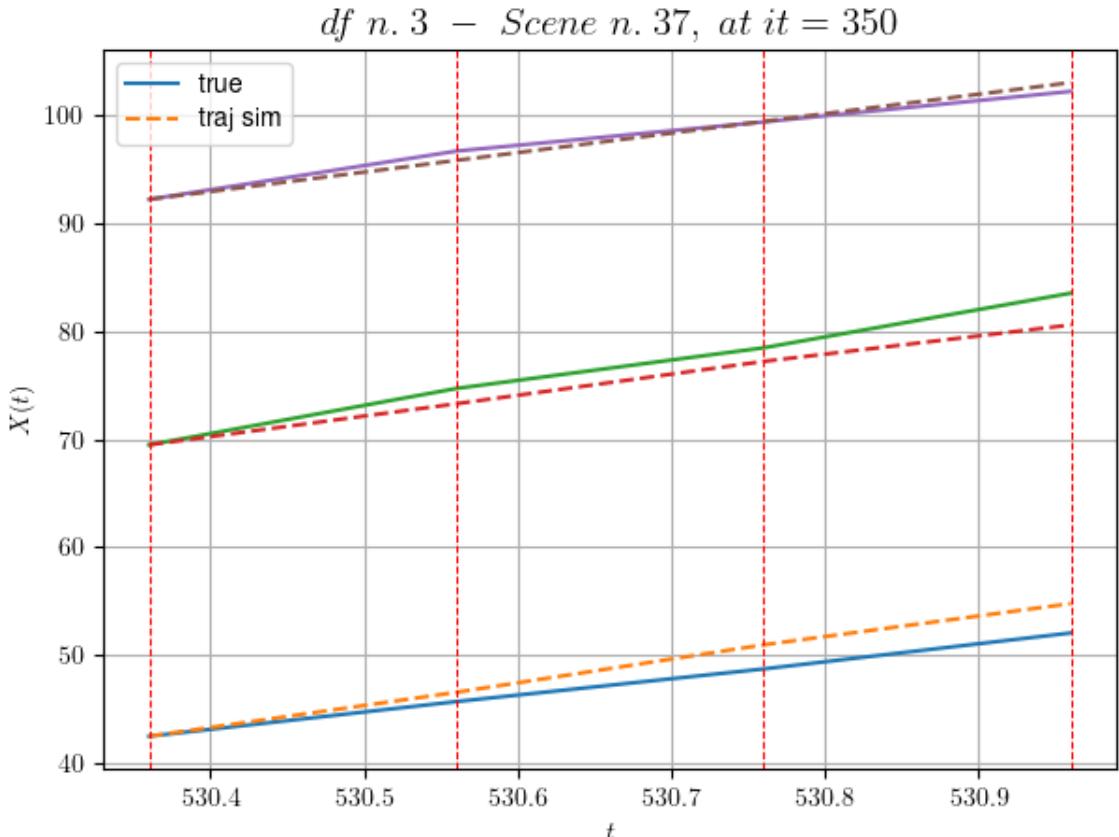
- Time interval n.2: [530.76, 530.96]
- \* y\_true: [16.69081323 25.36324467]
- \* v\_ann: [19.125267028808594, 16.92159080505371, 1

8.05494146639523]

```

* err= 2.2398351015381857
* Learning rate NN = 0.0002952449722215533
* diff = 0.004762613717725017

```



For scene 37/55

```

* use LR_NN=0.0005 with err=11.029733207655504 at it=19
* v0_scn_mean = 19.07871702356713
* MAE = 2.2398351015381857

```

- 
- 
- Time interval n.0: [576.56, 576.76]
    - \* y\_true: [22.12000755 22.50086521]
    - \* v\_ann: [23.919401168823242, 21.349853515625, 21.51674944574895]
- 
- 
- Time interval n.1: [576.76, 576.96]
    - \* y\_true: [22.90003133 17.69083 ]
    - \* v\_ann: [23.847312927246094, 21.482711791992188, 21.51674944574895]
- 
- 
- Time interval n.2: [576.96, 577.16]
    - \* y\_true: [24.57008129 24.8113942 ]
    - \* v\_ann: [23.352161407470703, 21.10862159729004, 21.51674944574895]

```

-----  

- Time interval n.3: [577.16, 577.36]  

  * y_true: [26.44016601 28.10183764]  

  * v_ann: [23.633628845214844, 21.152753829956055, 2  

  1.51674944574895]  

-----  

- Time interval n.4: [577.36, 577.56]  

  * y_true: [27.01028631 17.73134123]  

  * v_ann: [24.25255584716797, 21.227876663208008, 2  

  1.51674944574895]  

-----  

- Time interval n.5: [577.56, 577.76]  

  * y_true: [28.59045436 12.12102827]  

  * v_ann: [23.860794067382812, 21.579713821411133, 2  

  1.51674944574895]  

-----  

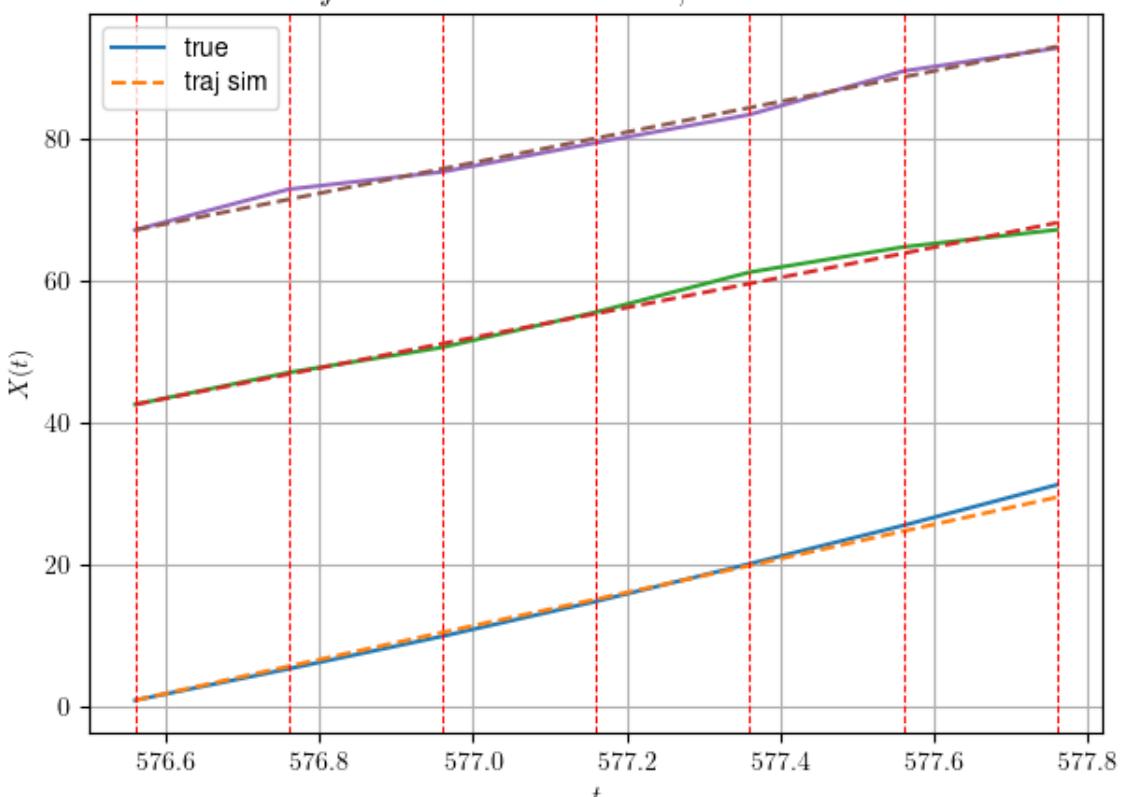
* err= 0.6375250204171025  

* Learning rate NN = 1.5690524378442205e-05  

* diff = 0.0011500329629453576

```

*df n. 3 – Scene n. 38, at it = 350*



For scene 38/55

```

* use LR_NN=5e-05 with err=19.254689836472338 at it=19
* v0_scn_mean = 22.243823703139142
* MAE = 0.6251237352596327

```

```
=====
- Time interval n.0: [579.56, 579.76]
  * y_true: [21.03058275 42.18516565]
  * v_ann: [25.76563835144043, 23.24427032470703, 25.
35843800286102]

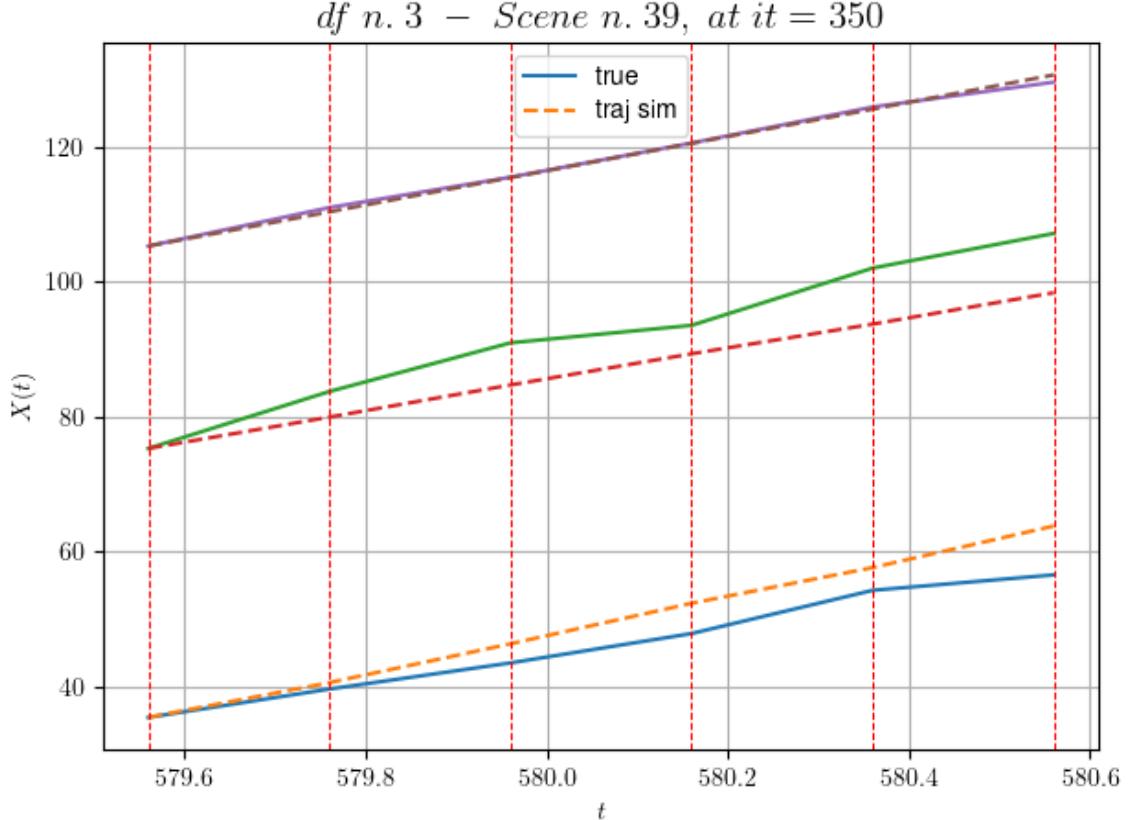
-----
- Time interval n.1: [579.76, 579.96]
  * y_true: [19.36065083 36.06520173]
  * v_ann: [28.7778263092041, 23.777109146118164, 25.
35843800286102]

-----
- Time interval n.2: [579.96, 580.16]
  * y_true: [21.76088956 12.96224398]
  * v_ann: [30.042638778686523, 23.120729446411133, 2
5.35843800286102]

-----
- Time interval n.3: [580.16, 580.36]
  * y_true: [32.02164742 42.42773504]
  * v_ann: [26.437435150146484, 21.991317749023438, 2
5.35843800286102]

-----
- Time interval n.4: [580.36, 580.56]
  * y_true: [11.44064385 25.66536311]
  * v_ann: [30.810962677001953, 23.267473220825195, 2
5.35843800286102]

-----
* err= 17.314279541029205
* Learning rate NN = 3.874203684972599e-05
* diff = 0.08853551918829794
```



For scene 39/55

\* use LR\_NN=0.0001 with err=37.8052369950259 at it=19

\* v0\_scn\_mean = 25.756252522262272

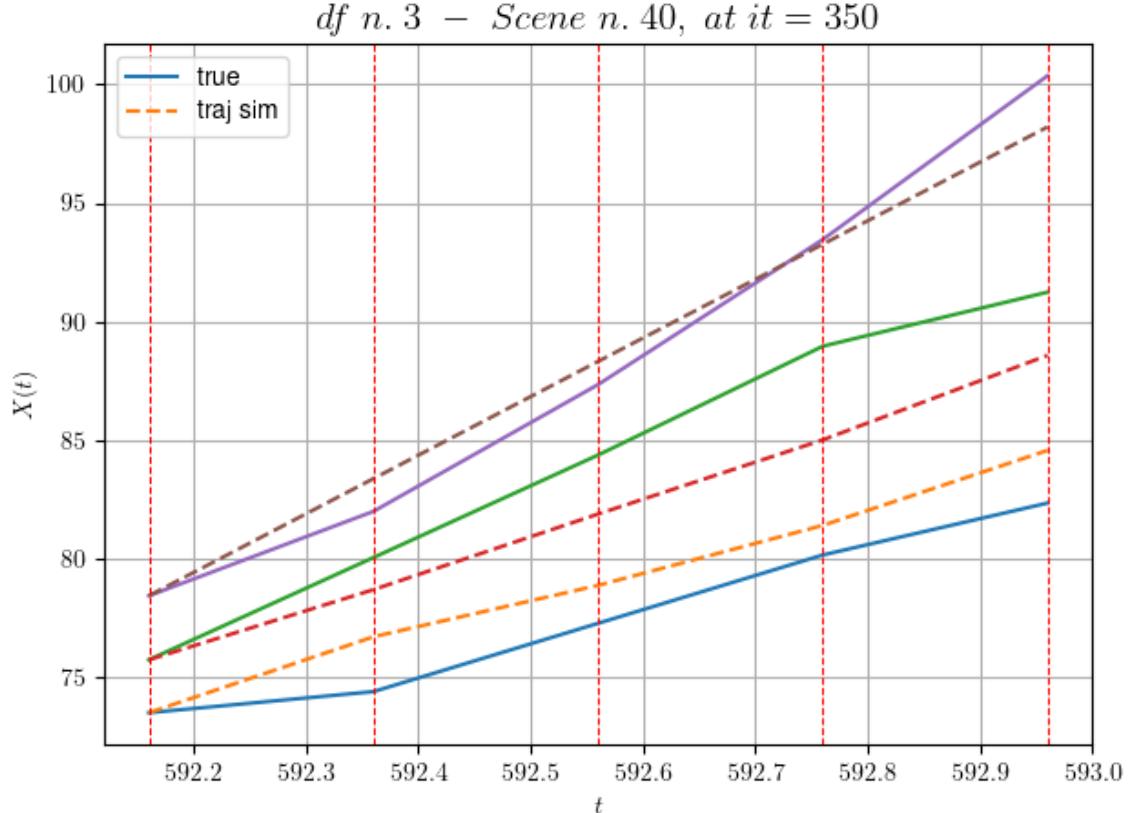
\* MAE = 17.314279541029205

- 
- 
- Time interval n.0: [592.16, 592.36]
    - \* y\_true: [ 4.45046478 21.56401461]
    - \* v\_ann: [16.009471893310547, 14.796456336975098, 2 4.71001897344754]
- 
- Time interval n.1: [592.36, 592.56]
    - \* y\_true: [14.40168088 21.61284101]
    - \* v\_ann: [10.838993072509766, 15.940418243408203, 2 4.71001897344754]
- 
- Time interval n.2: [592.56, 592.76]
    - \* y\_true: [14.40168088 22.933287 ]
    - \* v\_ann: [12.64571762084961, 15.630746841430664, 2 4.71001897344754]
- 
- Time interval n.3: [592.76, 592.96]
    - \* y\_true: [10.94538603 11.39186219]
    - \* v\_ann: [15.809948921203613, 17.816814422607422, 2 4.71001897344754]

```

* err= 3.5107176662542146
* Learning rate NN = 0.002391484100371599
* diff = 0.0012739782748516504

```



For scene 40/55

```

* use LR_NN=0.005 with err=12.915777229165146 at it=19
* v0_scn_mean = 25.163407565696268
* MAE = 3.1121163017844906

```

---



---

- Time interval n.0: [21.56, 21.76]  
\* y\_true: [26.48927836 26.93283237 27.60013316]  
\* v\_ann: [24.835285186767578, 26.11977767944336, 2  
4.129240036010742, 29.083788662827395]

---



---

- Time interval n.1: [21.76, 21.96]  
\* y\_true: [24.19440937 24.35304119 22.73494812]  
\* v\_ann: [24.993104934692383, 26.359941482543945, 2  
4.187135696411133, 29.083788662827395]

---

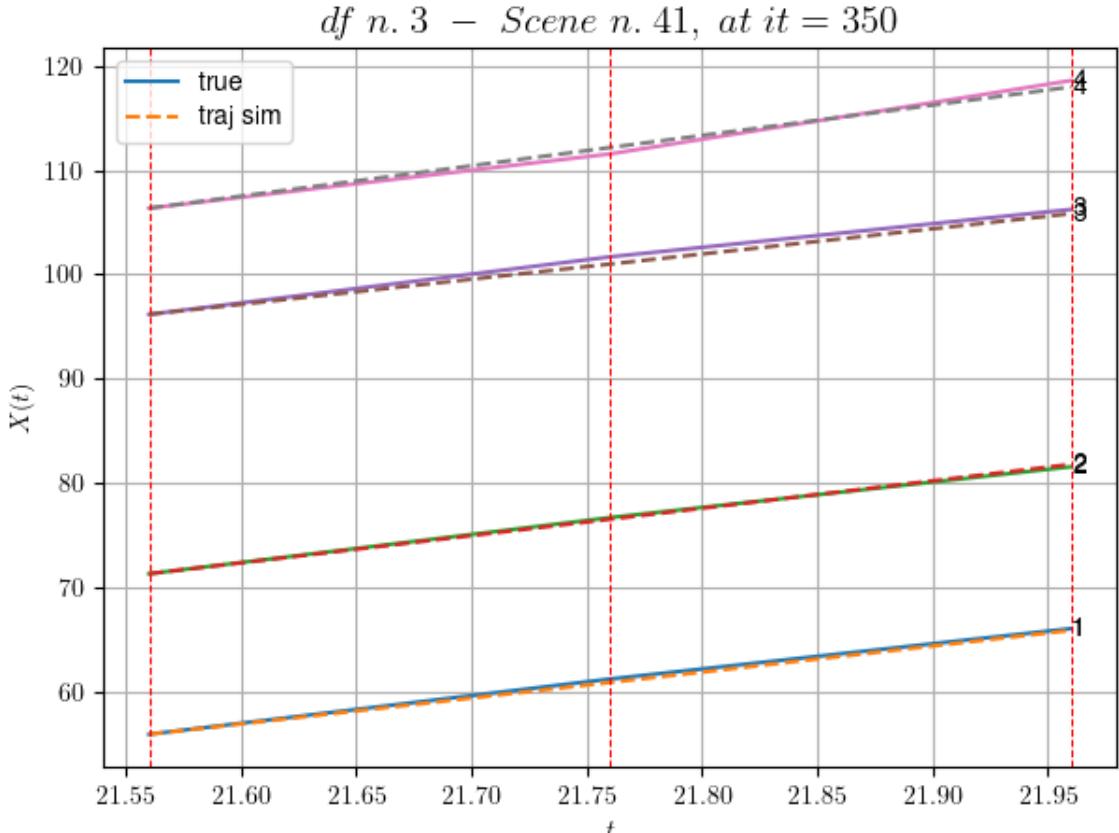


---

```

* err= 0.1349866033955539
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.0015377815171024878

```



For scene 41/55

```
* use LR_NN=5e-05 with err=3.7487507341144166 at it=19
* v0_scn_mean = 29.188365659888316
* MAE = 0.1349866033955539
```

---



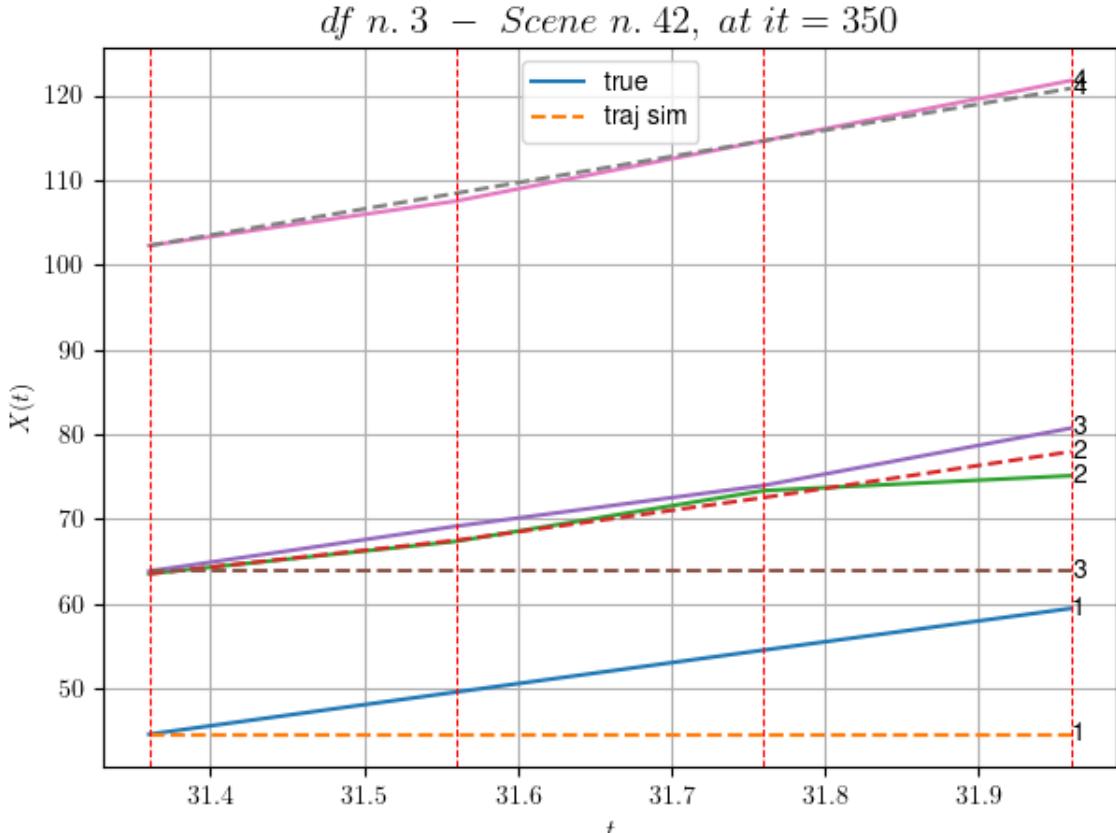
---

```
- Time interval n.0: [31.36, 31.56]
* y_true: [24.92105739 19.11766565 26.56610692]
* v_ann: [1.9518281847534513e-15, 19.69894409179687
5, 2.2124143906747507e-35, 30.917043677928955]

-----
- Time interval n.1: [31.56, 31.76]
* y_true: [24.72130541 29.91666352 24.00857353]
* v_ann: [3.1600417405410267e-14, 25.22501945495605
5, 2.743222410524238e-35, 30.917043677928955]

-----
- Time interval n.2: [31.76, 31.96]
* y_true: [24.58151426 8.80091982 33.80389928]
* v_ann: [2.9123868403458774e-15, 27.07658386230468
8, 1.3824271218538162e-37, 30.917043677928955]

-----
* err= 48.09612852846717
* Learning rate NN = 0.0005904899444431067
* diff = 0.001340340271731577
```



For scene 42/55

```
* use LR_NN=0.001 with err=14.447306657868122 at it=19
* v0_scn_mean = 30.812371676917216
* MAE = 48.09612852846717
```

---



---

```
- Time interval n.0: [33.76, 33.96]
* y_true: [24.27120267 28.75319668 39.53553599]
* v_ann: [4.211583626465205e-20, 0.0017407203558832
407, 6.023846521924244e-20, 24.316455544260613]
```

---

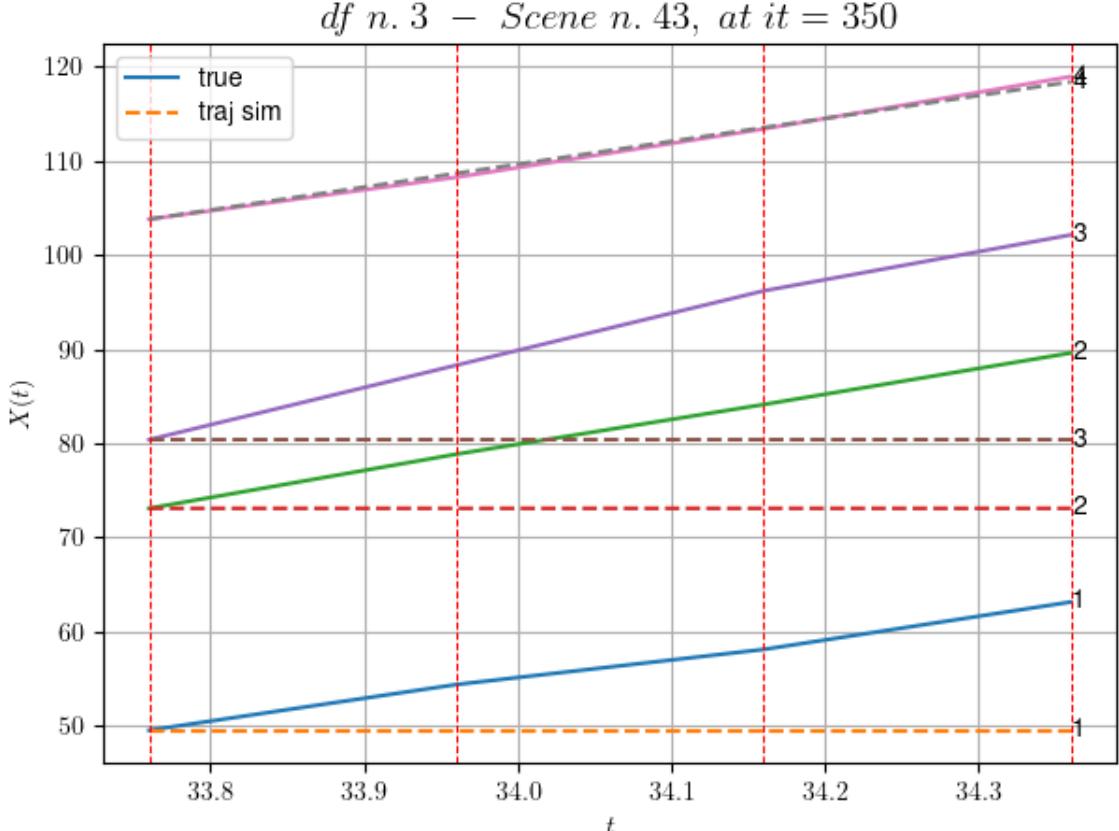
```
- Time interval n.1: [33.96, 34.16]
* y_true: [18.63110748 26.36338094 39.47623422]
* v_ann: [5.121368401380596e-21, 1.0942497283394914
e-05, 2.045406558351314e-16, 24.316455544260613]
```

---

```
- Time interval n.2: [34.16, 34.36]
* y_true: [25.20172426 27.37399424 29.73574355]
* v_ann: [1.3504015062918746e-22, 2.298722101556904
8e-08, 1.3578382667377153e-13, 24.316455544260613]
```

---

```
* err= 93.4528888736745
* Learning rate NN = 5.904899080633186e-05
* diff = 3.6321513761095048e-06
```



For scene 43/55

```
* use LR_NN=0.0001 with err=15.645374205926661 at it=19
* v0_scn_mean = 24.965179247765086
* MAE = 93.44871700698857
```

---



---

For scene 44/55

```
* use LR_NN=0.0001 with err=9.554010933472615 at it=19
* v0_scn_mean = 33.4870317483745
* MAE = 35.74461712358815
```

---



---

- Time interval n.0: [83.36, 83.56]
  - \* y\_true: [27.1108197 22.97496526 13.79424223]
  - \* v\_ann: [0.0, 2.3341104592335517e-16, 1.1356521099514794e-05, 26.108277505261064]

---



---

- Time interval n.1: [83.56, 83.76]
  - \* y\_true: [28.73111951 35.1785896 26.83859352]
  - \* v\_ann: [0.0, 1.74605050876726e-14, 2.149384044969338e-06, 26.108277505261064]

---



---

- Time interval n.2: [83.76, 83.96]

```

* y_true: [29.25142438 34.77932949 18.27648805]
* v_ann: [0.0, 8.798024700266971e-13, 2.35482868760
07296e-08, 26.108277505261064]

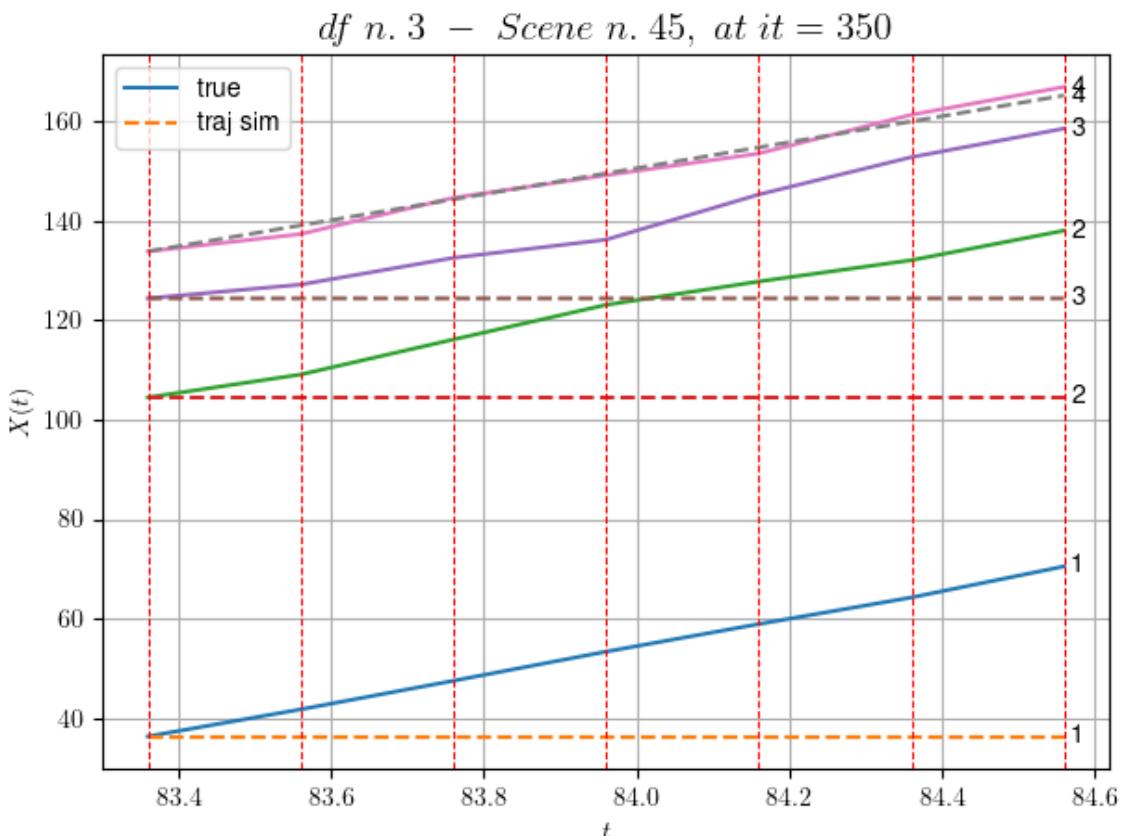
-----
- Time interval n.3: [83.96, 84.16]
* y_true: [27.70171969 23.46694627 45.36715188]
* v_ann: [0.0, 2.0553316826266155e-09, 3.0568738651
48191e-09, 26.108277505261064]

-----
- Time interval n.4: [84.16, 84.36]
* y_true: [26.72197507 21.43687952 37.53588876]
* v_ann: [0.0, 6.961346375646688e-14, 0.00018852326
32048428, 26.108277505261064]

-----
- Time interval n.5: [84.36, 84.56]
* y_true: [31.24277517 29.71036516 28.7233215 ]
* v_ann: [0.0, 3.602708064741622e-17, 9.75088041741
401e-05, 26.108277505261064]

-----
* err= 301.74863626345507
* Learning rate NN = 1.5690524378442205e-05
* diff = 2.021741437374658e-05

```



For scene 45/55

```

* use LR_NN=5e-05 with err=116.11360012875463 at it=19
* v0_scn_mean = 26.552481408205708

```

\* MAE = 301.7111133745589

---



---

- Time interval n.0: [94.36, 94.56]  
 \* y\_true: [33.70387327 38.57908217 21.70251029]  
 \* v\_ann: [0.007687269244343042, 23.824831008911133,  
 0.010544706135988235, 29.526223424799767]

---



---

- Time interval n.1: [94.56, 94.76]  
 \* y\_true: [29.14386677 24.50535727 32.05702124]  
 \* v\_ann: [0.007212402299046516, 21.338340759277344,  
 0.0045985691249370575, 29.526223424799767]

---



---

- Time interval n.2: [94.76, 94.96]  
 \* y\_true: [29.96461386 30.28702151 28.36707369]  
 \* v\_ann: [0.01877659745514393, 28.646860122680664,  
 0.04715342074632645, 29.526223424799767]

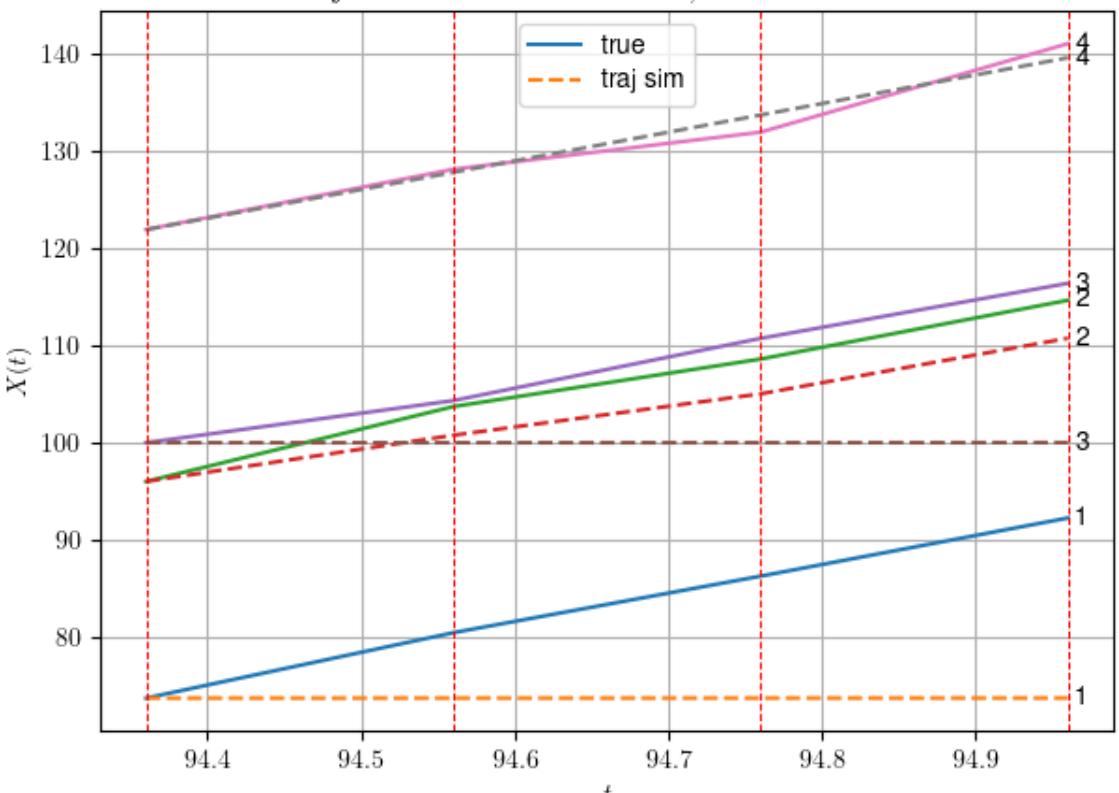
---



---

\* err= 62.098872735274796  
 \* Learning rate NN = 0.0005904899444431067  
 \* diff = 1.045200060042244

df n. 3 – Scene n. 46, at it = 350



For scene 46/55

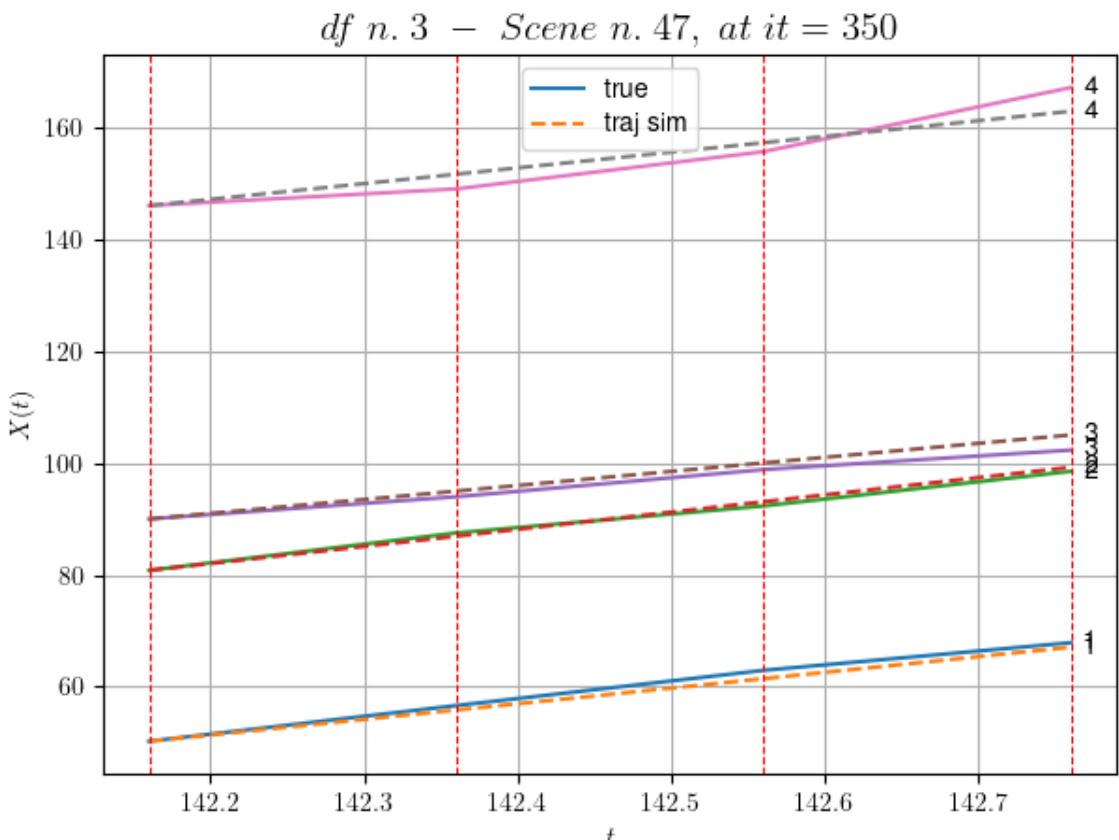
\* use LR\_NN=0.001 with err=24.319534455724792 at it=19  
 \* v0\_scn\_mean = 29.58030061147272  
 \* MAE = 8.229682073133665

```
=====
=====
- Time interval n.0: [142.16, 142.36]
  * y_true: [31.90177154 33.47450881 19.84324761]
  * v_ann: [27.9312744140625, 30.49253273010254, 24.8
78738403320312, 28.121504824700203]

-----
- Time interval n.1: [142.36, 142.56]
  * y_true: [31.50218522 24.08376432 24.27420294]
  * v_ann: [28.02027130126953, 30.846548080444336, 2
5.221572875976562, 28.121504824700203]

-----
- Time interval n.2: [142.56, 142.76]
  * y_true: [24.70204715 30.9853993 17.45337402]
  * v_ann: [28.19320297241211, 30.839893341064453, 2
5.01808738708496, 28.121504824700203]

-----
* err= 2.6398688144895184
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.005423653898877667
```



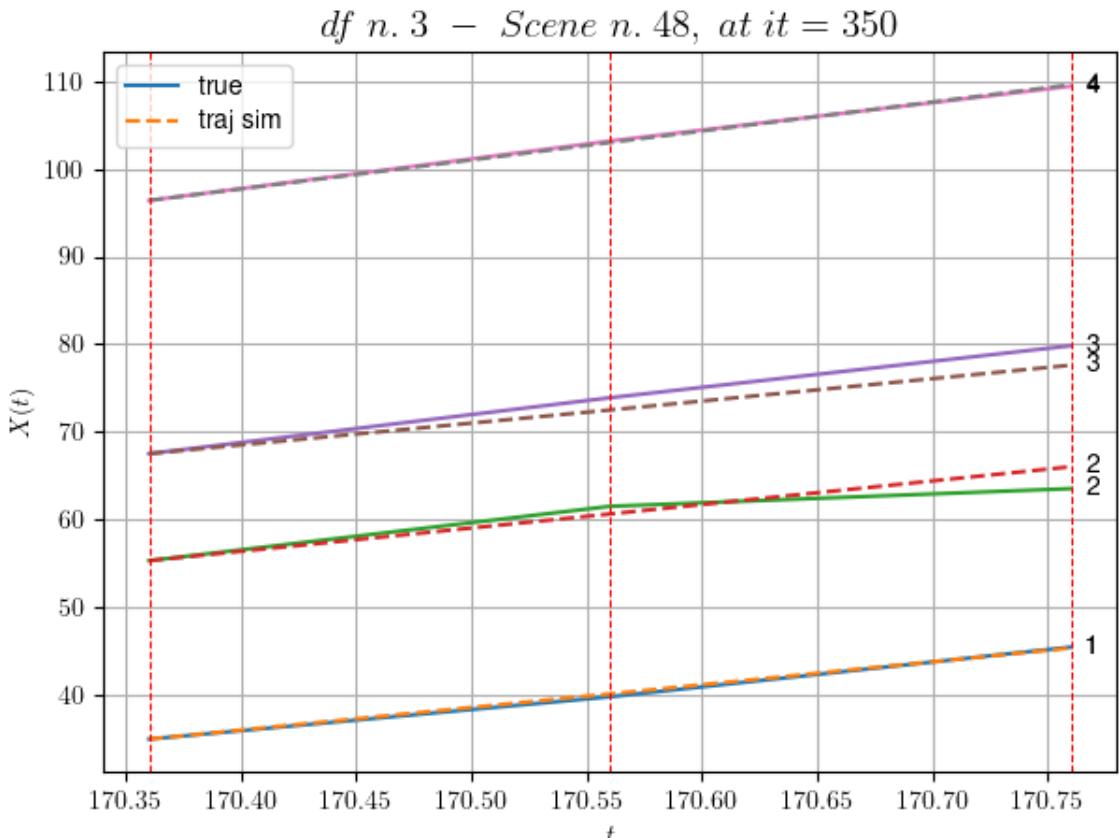
For scene 47/55

- \* use LR\_NN=1e-05 with err=32.41184752835993 at it=19
- \* v0\_scn\_mean = 28.33591756601419
- \* MAE = 2.4608695235002234

```
=====
=====
- Time interval n.0: [170.36, 170.56]
  * y_true: [24.1106547 30.95205085 31.86307572]
  * v_ann: [25.769290924072266, 26.60819435119629, 2
4.891782760620117, 32.99611396138392]

-----
- Time interval n.1: [170.56, 170.76]
  * y_true: [28.33103197 10.10076519 29.63331411]
  * v_ann: [26.13588523864746, 26.896333694458008, 2
5.519935607910156, 32.99611396138392]

-----
* err= 1.1668032881166388
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.00489424402981653
```



For scene 48/55

- \* use LR\_NN=5e-05 with err=1.8249525404369753 at it=19
- \* v0\_scn\_mean = 32.654135437192245
- \* MAE = 1.1668032881166388

```
=====
=====
- Time interval n.0: [248.16, 248.36]
  * y_true: [31.21204442 24.6823336 32.34552948]
```

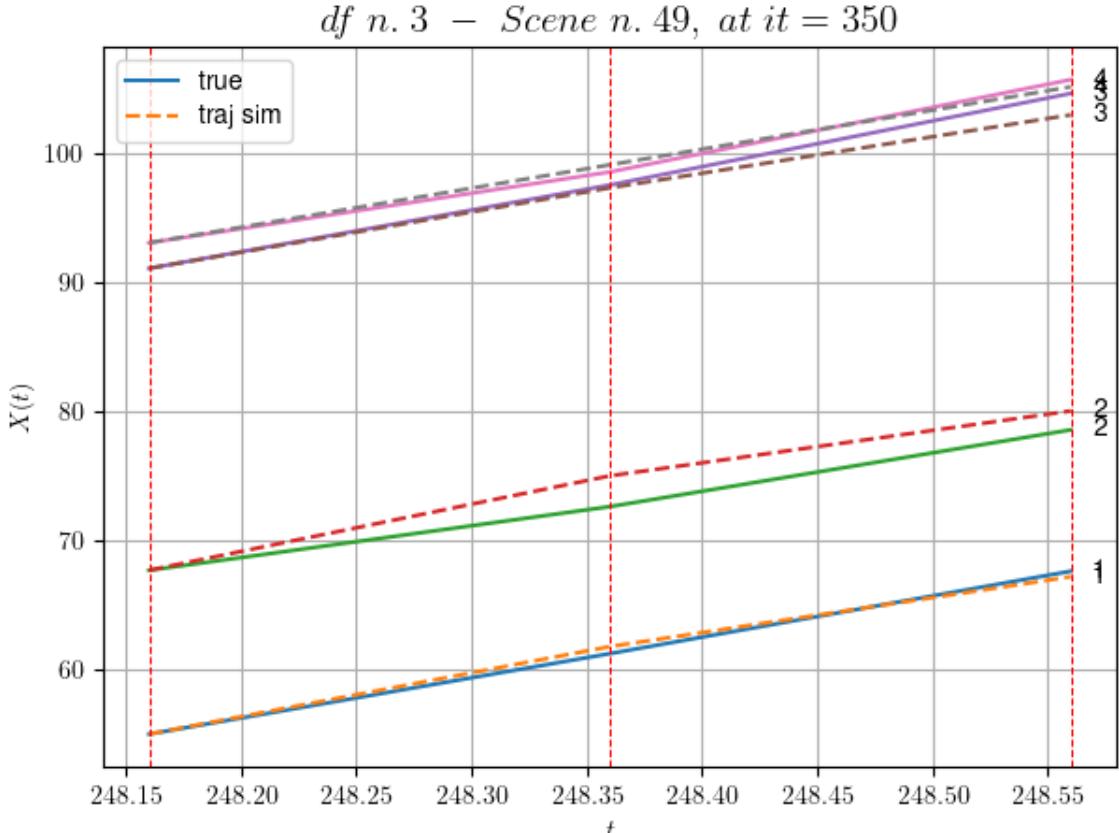
\* v\_ann: [33.93238067626953, 36.62454605102539, 31.236186981201172, 30.248935217315978]

---

- Time interval n.1: [248.36, 248.56]  
 \* y\_true: [31.9625999 29.77329807 35.48696999]  
 \* v\_ann: [27.116512298583984, 25.15591812133789, 28.29195785522461, 30.248935217315978]

---

\* err= 0.9792436889313199  
 \* Learning rate NN = 0.0007289999630302191  
 \* diff = 0.0030521933628248066



For scene 49/55

\* use LR\_NN=0.001 with err=16.780155011568937 at it=19  
 \* v0\_scn\_mean = 30.22052157907147  
 \* MAE = 0.7446852919198539

---

- Time interval n.0: [320.56, 320.76]  
 \* y\_true: [27.61038846 20.60122903 24.07186814]  
 \* v\_ann: [29.78746223449707, 29.04620933532715, 29.724220275878906, 28.130406759666666]

---

- Time interval n.1: [320.76, 320.96]  
 \* y\_true: [30.26064275 26.25184013 33.56317876]

```
* v_ann: [28.275829315185547, 28.485868453979492, 2
8.30592155456543, 28.130406759666666]
```

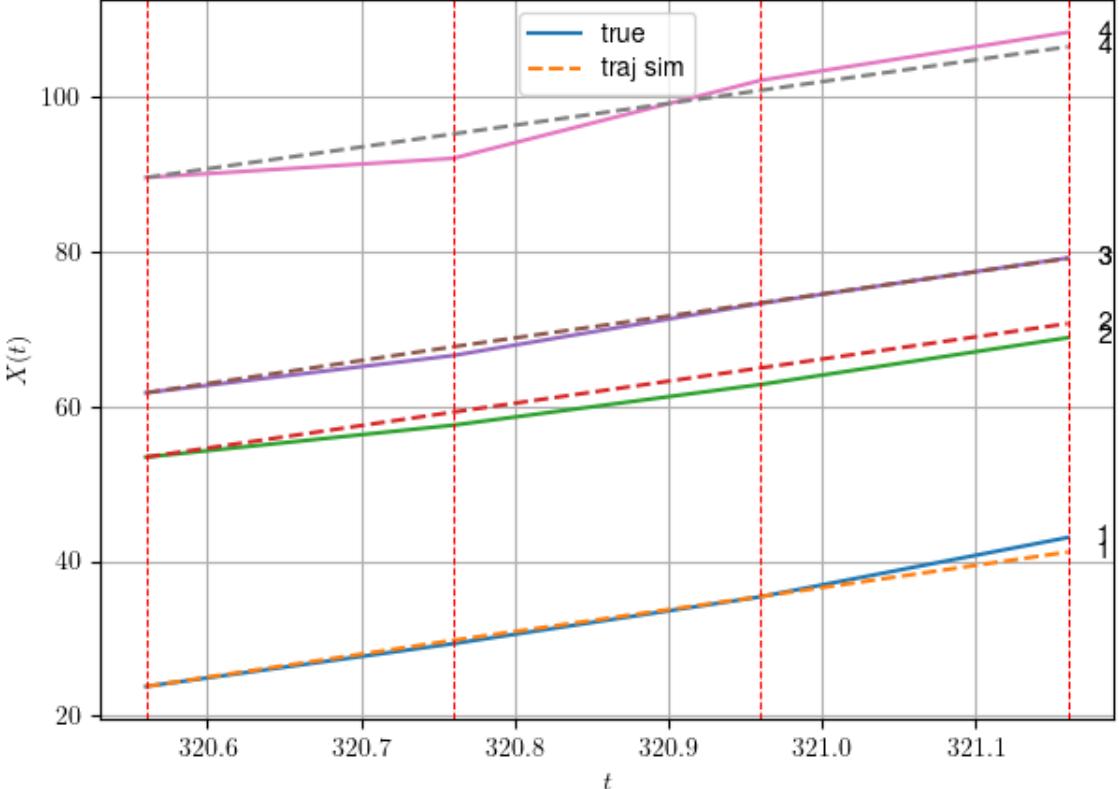
---

```
- Time interval n.2: [320.96, 321.16]
* y_true: [38.25114958 30.20253063 29.36323845]
* v_ann: [28.698387145996094, 28.659622192382812, 2
8.701587677001953, 28.130406759666666]
```

---

```
* err= 1.9226512858095246
* Learning rate NN = 5.904899080633186e-05
* diff = 0 00006310101225007101
```

*df n. 3 – Scene n. 50, at it = 350*



For scene 50/55

```
* use LR_NN=0.0001 with err=8.046510981313002 at it=19
* v0_scn_mean = 28.34380342795366
* MAE = 1.9162524898254263
```

---



---

```
- Time interval n.0: [333.96, 334.16]
* y_true: [31.40121985 21.58136302 16.05156144]
* v_ann: [29.469907760620117, 29.49220848083496, 2
9.483991622924805, 24.21959719997371]
```

---

```
- Time interval n.1: [334.16, 334.36]
* y_true: [27.67132891 33.9725354 36.25406589]
* v_ann: [29.17800521850586, 29.11346435546875, 29.
```

088579177856445, 24.21959719997371]

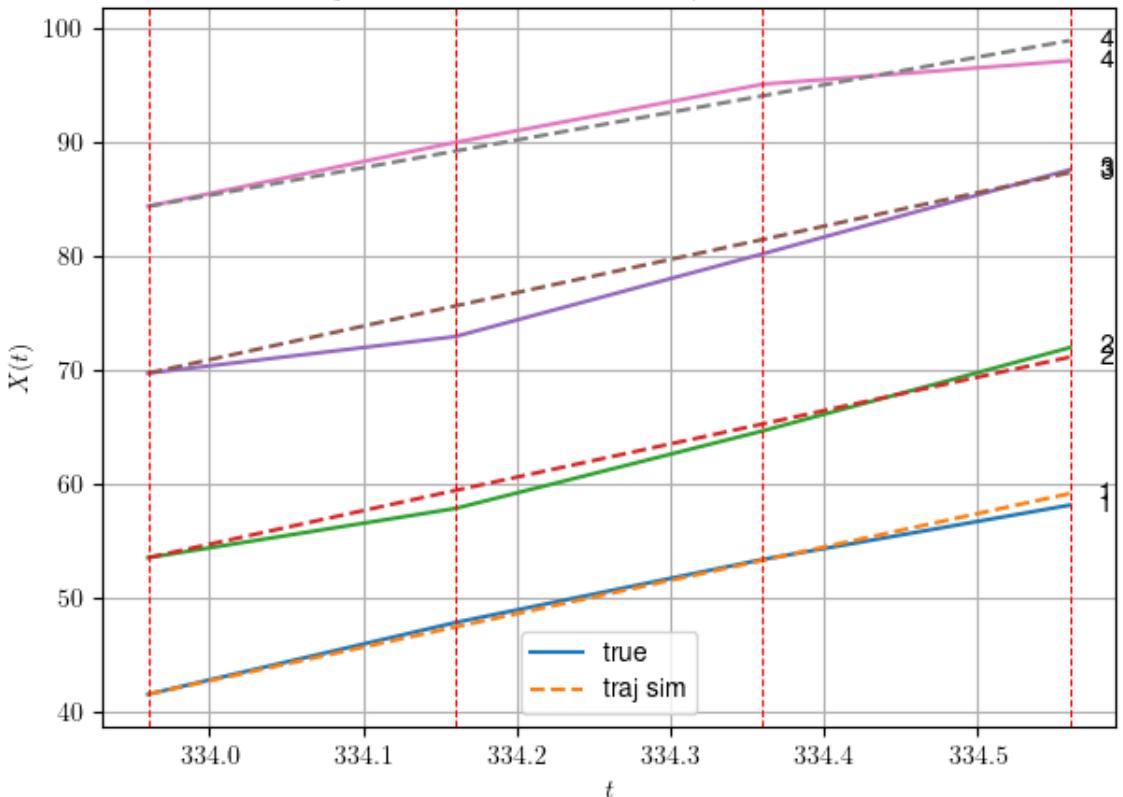
---

- Time interval n.2: [334.36, 334.56]
  - \* y\_true: [23.81145278 36.52334008 36.85496039]
  - \* v\_ann: [29.324260711669922, 29.31085205078125, 29.31292724609375, 24.21959719997371]

---

- \* err= 1.1489774154709922
- \* Learning rate NN = 2.952449540316593e-05
- \* diff = 5.395295296928282e-05

*df n. 3 – Scene n. 51, at it = 350*



For scene 51/55

- \* use LR\_NN=5e-05 with err=4.322068470192431 at it=19
- \* v0\_scn\_mean = 24.879376382028767
- \* MAE = 1.1452785385223754

---



---

- Time interval n.0: [393.36, 393.56]
  - \* y\_true: [28.21049617 36.91227562 35.66212709]
  - \* v\_ann: [32.01728057861328, 37.30259704589844, 21.14476203918457, 27.00671910788559]

---

- Time interval n.1: [393.56, 393.76]
  - \* y\_true: [27.89067116 17.24119841 30.82238865]
  - \* v\_ann: [37.07746124267578, 13.901176452636719, 3

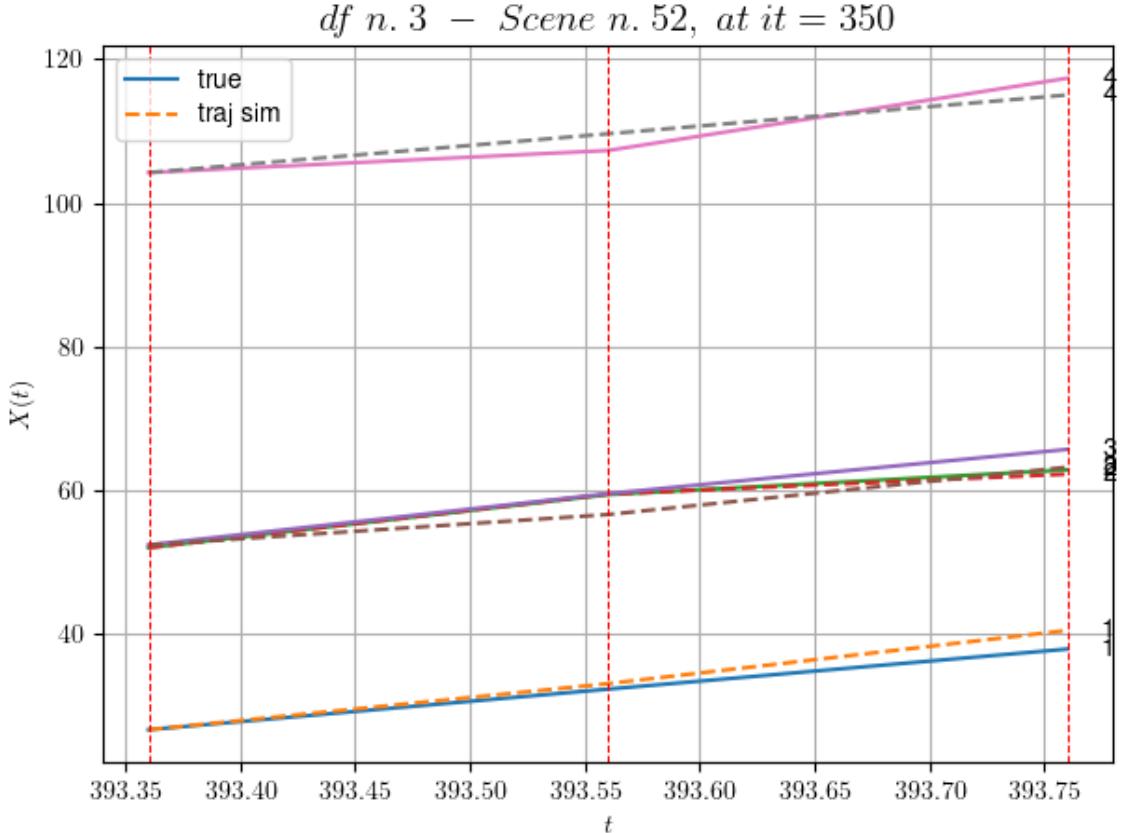
2.958919525146484, 27.00671910788559]

---



---

- \* err= 2.7593003551735524
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.025104354059070744



For scene 52/55

- \* use LR\_NN=0.0001 with err=14.594224371018452 at it=19
- \* v0\_scn\_mean = 27.348374263587246
- \* MAE = 2.7593003551735524

---



---

- Time interval n.0: [521.76, 521.96]
- \* y\_true: [10.54036018 15.07054541 11.30098461]
- \* v\_ann: [15.938020706176758, 15.328964233398438, 1

5.654970169067383, 17.24960046263986]

---



---

- Time interval n.1: [521.96, 522.16]
- \* y\_true: [20.11080333 12.92054275 19.50185752]
- \* v\_ann: [15.219143867492676, 14.060159683227539, 1

4.658486366271973, 17.24960046263986]

---



---

- Time interval n.2: [522.16, 522.36]
- \* y\_true: [16.31074126 16.85079656 12.50130097]
- \* v\_ann: [13.24677848815918, 15.174477577209473, 1

5.526802062988281, 17.24960046263986]

---

- Time interval n.3: [522.36, 522.56]
  - \* y\_true: [11.43058292 15.20080004 9.15100954]
  - \* v\_ann: [14.737640380859375, 15.308232307434082, 1

5.524609565734863, 17.24960046263986]

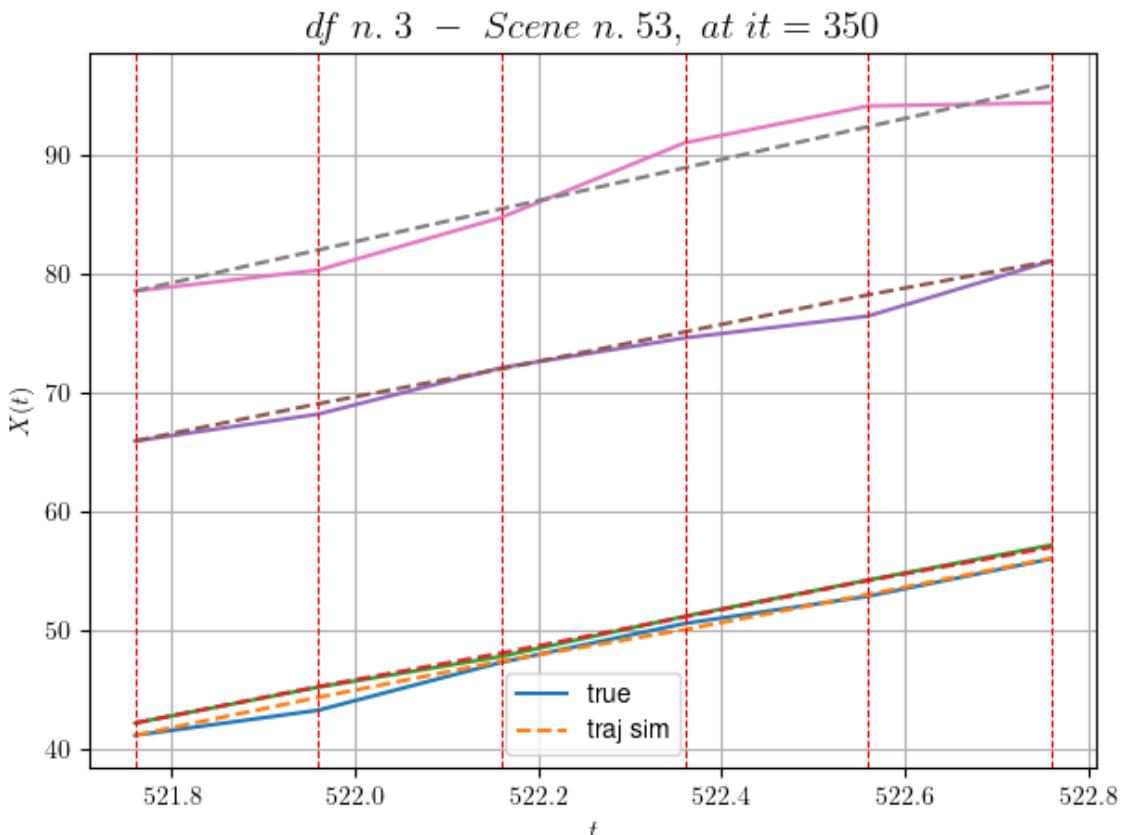
---

- Time interval n.4: [522.56, 522.76]
  - \* y\_true: [15.72089895 14.72089277 23.10276913]
  - \* v\_ann: [15.261841773986816, 13.98046588897705, 1

4.26059341430664, 17.24960046263986]

---

- \* err= 0.777293907963597
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 3.964810620871173e-05



For scene 53/55

- \* use LR\_NN=0.001 with err=25.103775063869072 at it=19
- \* v0\_scn\_mean = 18.70493990327428
- \* MAE = 0.7709251122641739

---



---

- Time interval n.0: [95.36, 95.56]
  - \* y\_true: [30.52238998 38.21809619 31.62683865 21.8

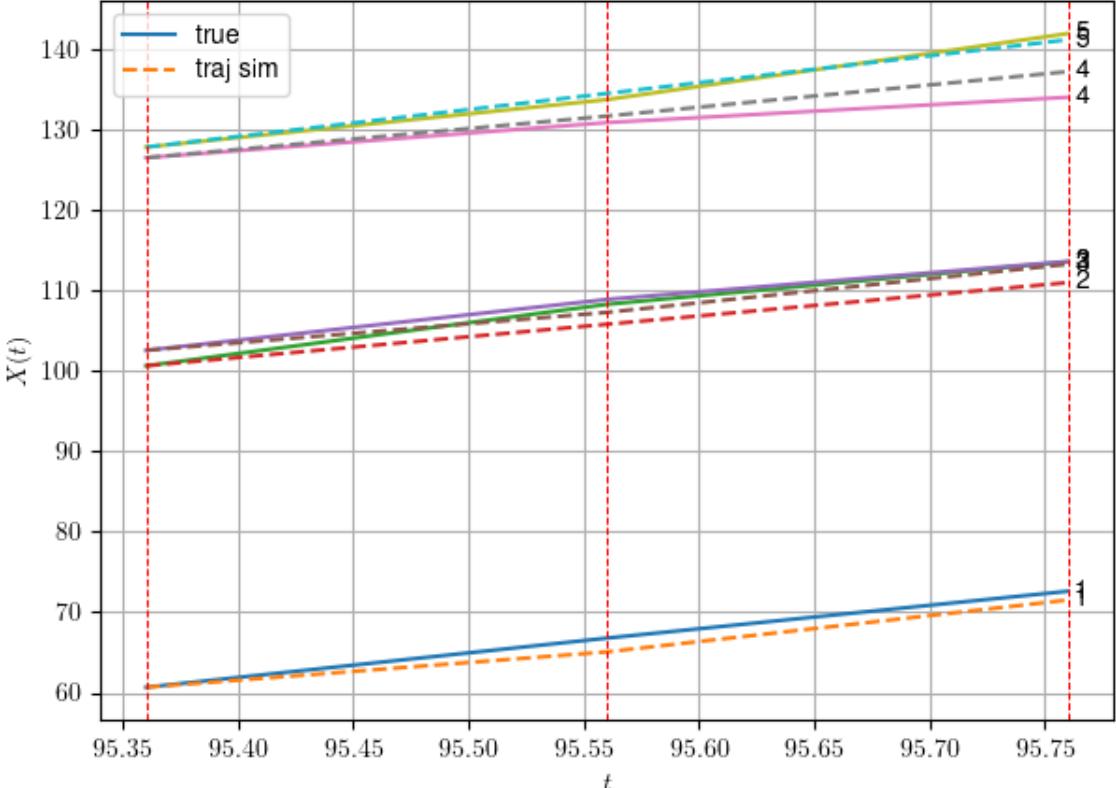
1676128]

```
* v_ann: [21.963178634643555, 25.815683364868164, 2
3.585010528564453, 25.867992401123047, 33.34860961624623]
```

```
- Time interval n.1: [95.56, 95.76]
* y_true: [29.11270185 26.43618159 23.59563306 15.7
3527867]
* v_ann: [32.21615982055664, 25.88467025756836, 29.
893714904785156, 27.617151260375977, 33.34860961624623]
```

```
* err= 2.1128812537750945
* Learning rate NN = 0.00036449998151510954
* diff = 7.702662724680722e-05
```

*df n. 3 – Scene n. 54, at it = 350*



For scene 54/55

```
* use LR_NN=0.0005 with err=17.248042086209125 at it=19
* v0_scn_mean = 32.8731334832019
* MAE = 2.094029042868709
```

```
=====
=====
```

For df=3 with 55 scenes, time taken: 618.49

```
=====
=====
```

```
*****
*****  
In df n.4/10 we have 30 scenes
```

```
*****
*****  
*****
```

```

- Time interval n.0: [7.04, 7.24]
  * y_true: [ 8.37556318 26.1843701 ]
  * v_ann: [17.57613182067871, 17.517425537109375, 3
6.154185886666866]

```

---

```

- Time interval n.1: [7.24, 7.44]
  * y_true: [12.54090657 23.03433042]
  * v_ann: [17.54067611694336, 17.502084732055664, 3
6.154185886666866]

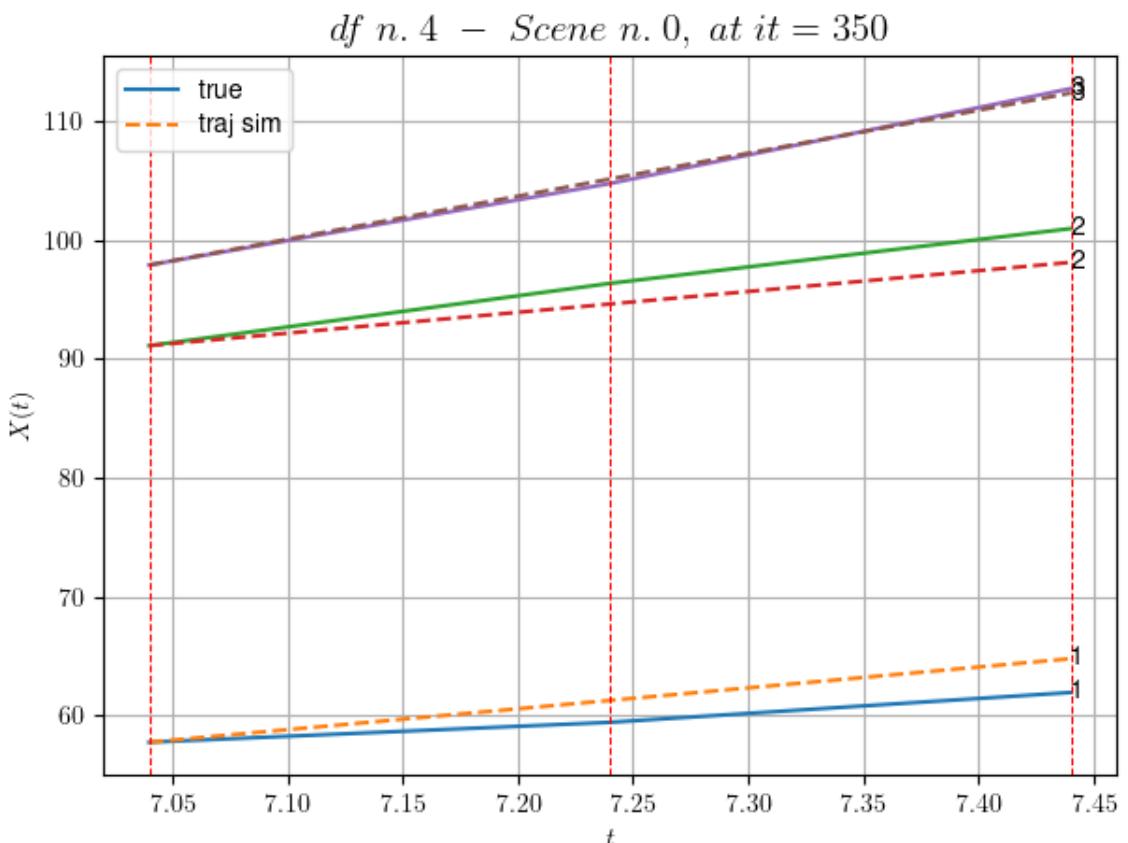
```

---

```

* err= 2.5340329654942573
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00012224376471614562

```



```

For scene 0/30
* use LR_NN=0.0001 with err=12.095532874970756 at it=19
* v0_scn_mean = 35.62672885769243
* MAE = 1.6989206375502752

```

---



---

```

- Time interval n.0: [19.84, 20.04]
  * y_true: [38.50393497 35.76621737]
  * v_ann: [30.71917152404785, 29.256393432617188, 2
6.058995147815406]

```

---



---

```

- Time interval n.1: [20.04, 20.24]
  * y_true: [14.10165462 33.63672046]
  * v_ann: [31.97687339782715, 29.65743064880371, 26.
  058995147815406]

```

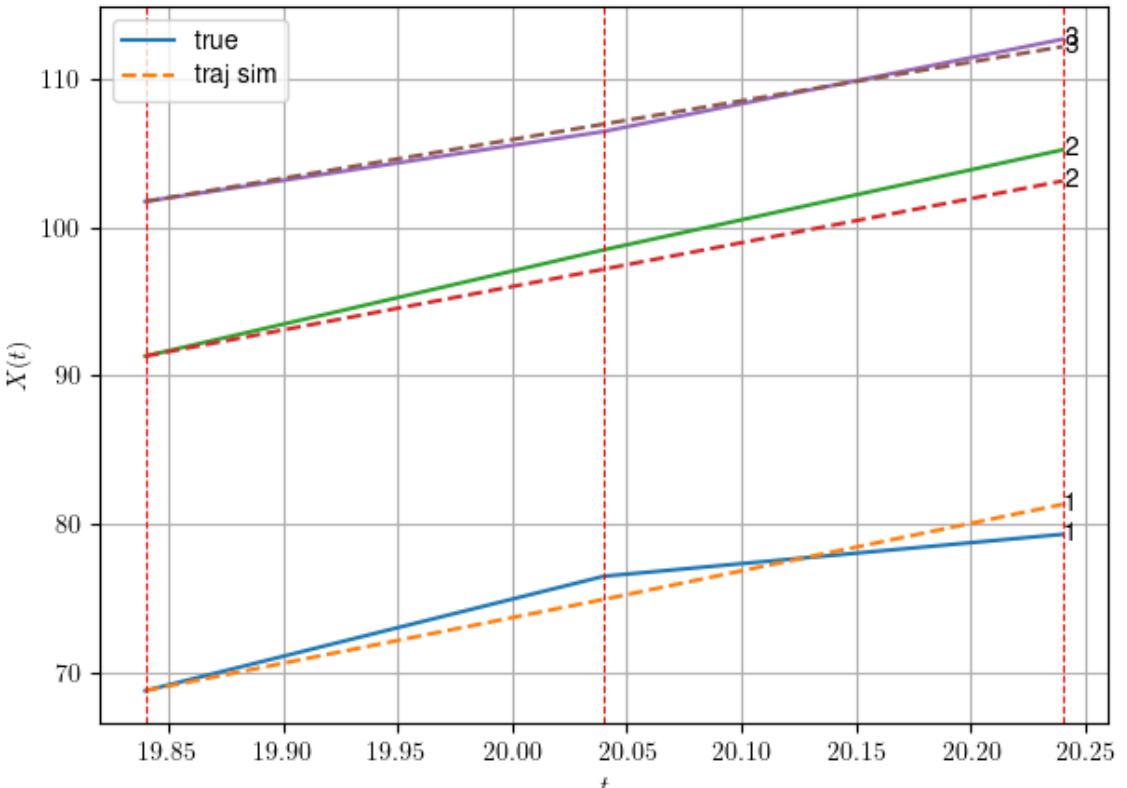
---

```

* err= 1.4540493017116833
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0018675646375023724

```

*df n. 4 – Scene n. 1, at it = 350*



For scene 1/30

```

* use LR_NN=0.0001 with err=10.025856736965268 at it=19
* v0_scn_mean = 26.396766991043375
* MAE = 1.4540493017116833

```

---



---

```

- Time interval n.0: [23.64, 23.84]
  * y_true: [16.50112189 27.57447859]
  * v_ann: [16.00058937072754, 18.251663208007812, 2
  5.974604646459856]

```

---

```

- Time interval n.1: [23.84, 24.04]
  * y_true: [13.80103575 15.46275359]
  * v_ann: [19.622516632080078, 13.686443328857422, 2
  5.974604646459856]

```

---



---

```

    - Time interval n.2: [24.04, 24.24]
      * y_true: [18.55153987 13.07248815]
      * v_ann: [16.592411041259766, 18.742069244384766, 2
5.974604646459856]
```

---

```

    - Time interval n.3: [24.24, 24.44]
      * y_true: [15.75144675 20.6942352 ]
      * v_ann: [15.762840270996094, 18.28226089477539, 2
5.974604646459856]
```

---

```

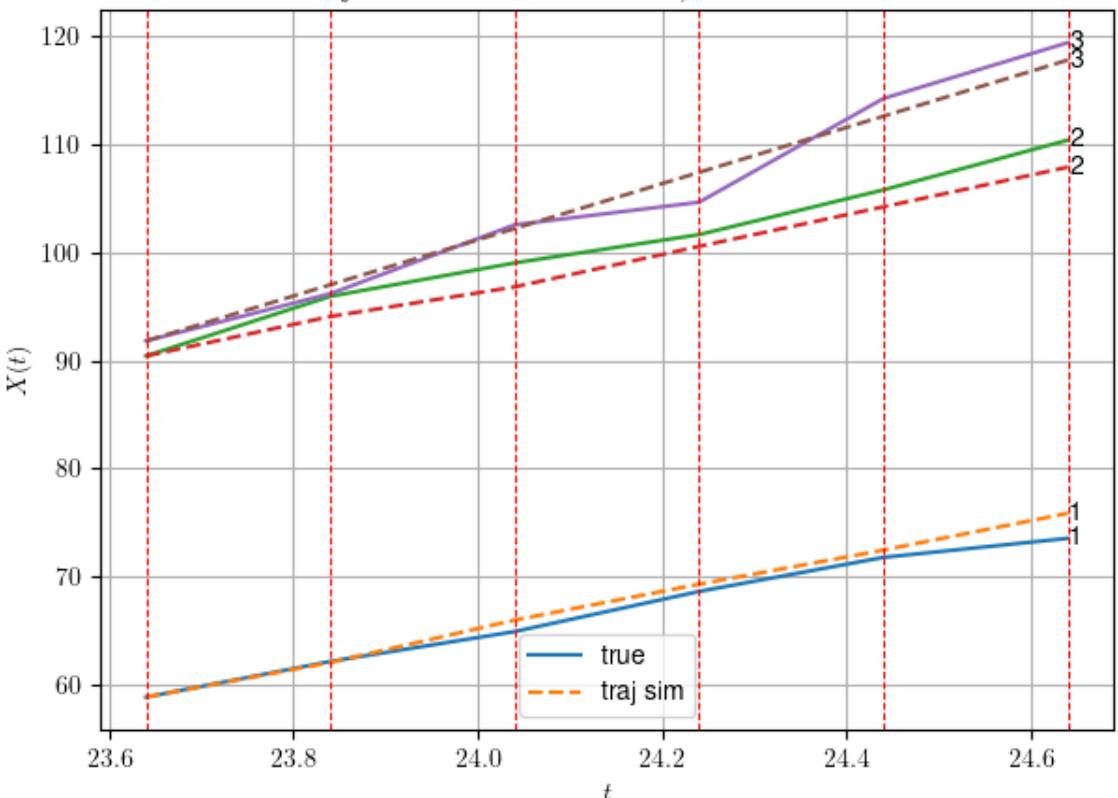
    - Time interval n.4: [24.44, 24.64]
      * y_true: [ 8.80086699 23.00509018]
      * v_ann: [17.031383514404297, 18.355165481567383, 2
5.974604646459856]
```

---

```

* err= 2.1895422222127454
* Learning rate NN = 0.0003874204121530056
* diff = 0.000619015565399561
```

*df n. 4 – Scene n. 2, at it = 350*



For scene 2/30

```

* use LR_NN=0.001 with err=36.88990077971608 at it=19
* v0_scn_mean = 26.31960934939313
* MAE = 2.1895422222127454
```

---



---

```
- Time interval n.0: [80.24, 80.44]
  * y_true: [20.8407888 28.56113721]
  * v_ann: [25.525924682617188, 27.576473236083984, 2
2.367829423056254]

-----
- Time interval n.1: [80.44, 80.64]
  * y_true: [28.49133895 28.481454 ]
  * v_ann: [26.273181915283203, 26.479333877563477, 2
2.367829423056254]

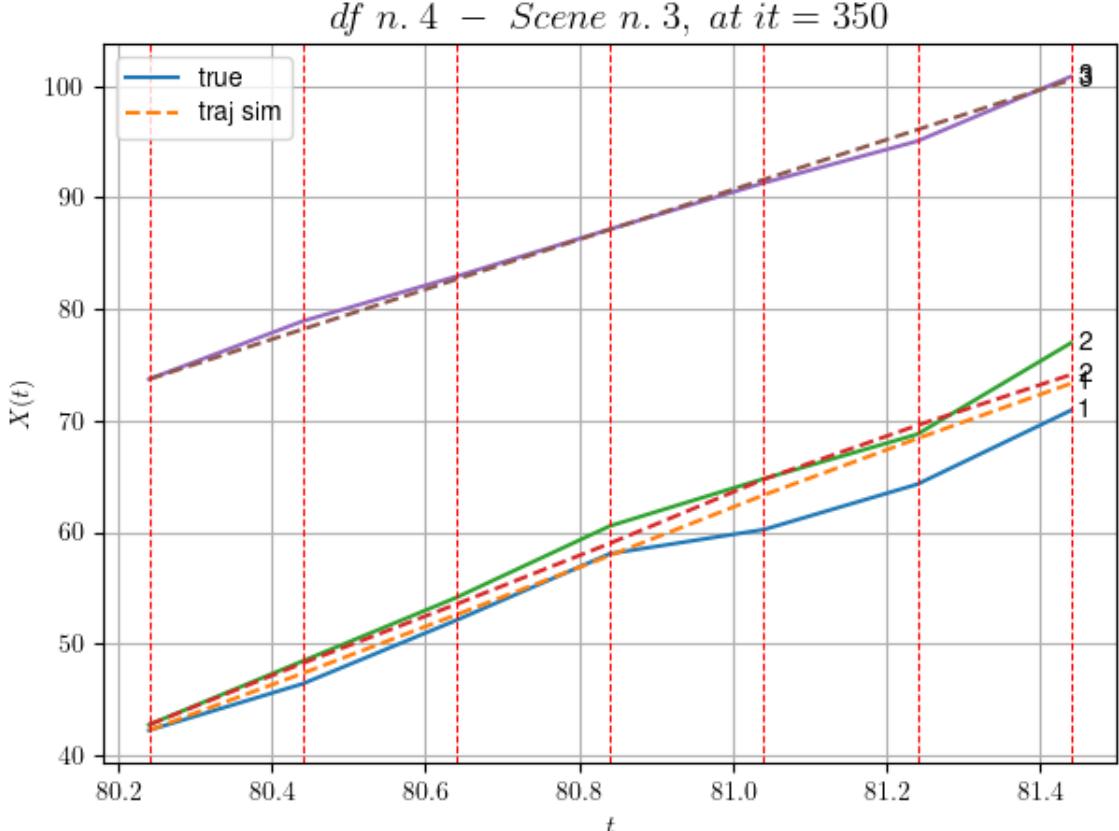
-----
- Time interval n.2: [80.64, 80.84]
  * y_true: [29.84173661 32.11200361]
  * v_ann: [26.54642677307129, 27.297992706298828, 2
2.367829423056254]

-----
- Time interval n.3: [80.84, 81.04]
  * y_true: [10.79069268 21.14157827]
  * v_ann: [27.101669311523438, 28.689716339111328, 2
2.367829423056254]

-----
- Time interval n.4: [81.04, 81.24]
  * y_true: [20.33152897 19.96178137]
  * v_ann: [25.351255416870117, 24.203828811645508, 2
2.367829423056254]

-----
- Time interval n.5: [81.24, 81.44]
  * y_true: [33.14293198 40.94411969]
  * v_ann: [24.697839736938477, 22.74439239501953, 2
2.367829423056254]

-----
* err= 2.2256174830986546
* Learning rate NN = 0.00015690525469835848
* diff = 0.0001850025416705112
```



For scene 3/30

```
* use LR_NN=0.0005 with err=75.45141833675403 at it=19
* v0_scn_mean = 23.02196013851973
* MAE = 2.193563469557272
```

---



---

```
- Time interval n.0: [89.04, 89.24]
* y_true: [19.34082001 24.8230577 ]
* v_ann: [19.669151306152344, 20.48894500732422, 3
2.77541157779944]
```

---

```
- Time interval n.1: [89.24, 89.44]
* y_true: [14.120693 17.32233598]
* v_ann: [19.695146560668945, 20.56686782836914, 3
2.77541157779944]
```

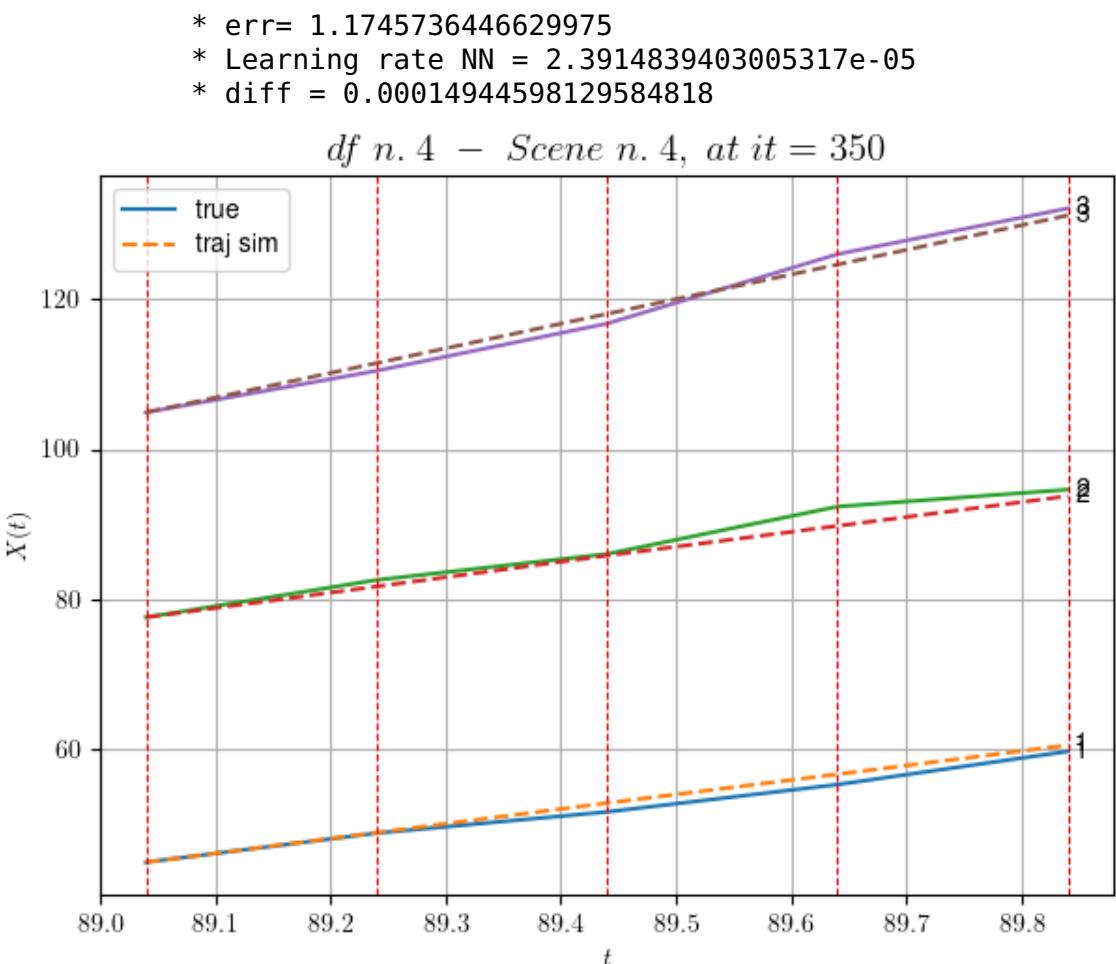
---

```
- Time interval n.2: [89.44, 89.64]
* y_true: [18.19104002 31.50485669]
* v_ann: [19.162736892700195, 19.75018882751465, 3
2.77541157779944]
```

---

```
- Time interval n.3: [89.64, 89.84]
* y_true: [22.07139916 11.31182118]
* v_ann: [19.338769912719727, 19.83424949645996, 3
```

2.77541157779944]



For scene 4/30

```

* use LR_NN=5e-05 with err=4.063352576361134 at it=19
* v0_scn_mean = 32.53753927885261
* MAE = 1.1735430563681626

```

---



---

```

- Time interval n.0: [96.44, 96.64]
  * y_true: [16.86045215 20.08121647]
  * v_ann: [18.86724281311035, 18.578222274780273, 1
8.401364416423622]

```

---



---

```

- Time interval n.1: [96.64, 96.84]
  * y_true: [17.24055532 8.93061591]
  * v_ann: [18.82361602783203, 18.557588577270508, 1
8.401364416423622]

```

---



---

```

- Time interval n.2: [96.84, 97.04]
  * y_true: [21.11081641 16.18118624]
  * v_ann: [18.63232421875, 18.071489334106445, 18.40

```

1364416423622]

```

-----  

-----  

    - Time interval n.3: [97.04, 97.24]  

      * y_true: [26.9212791 14.46120094]  

      * v_ann: [18.70470428466797, 18.118297576904297, 1  

8.401364416423622]  

-----  

-----  

    - Time interval n.4: [97.24, 97.44]  

      * y_true: [17.07093447 27.60253797]  

      * v_ann: [18.9460506439209, 18.285425186157227, 18.  

401364416423622]  

-----  

-----  

    - Time interval n.5: [97.44, 97.64]  

      * y_true: [14.70092006 22.05229805]  

      * v_ann: [19.001434326171875, 18.594980239868164, 1  

8.401364416423622]  

-----  

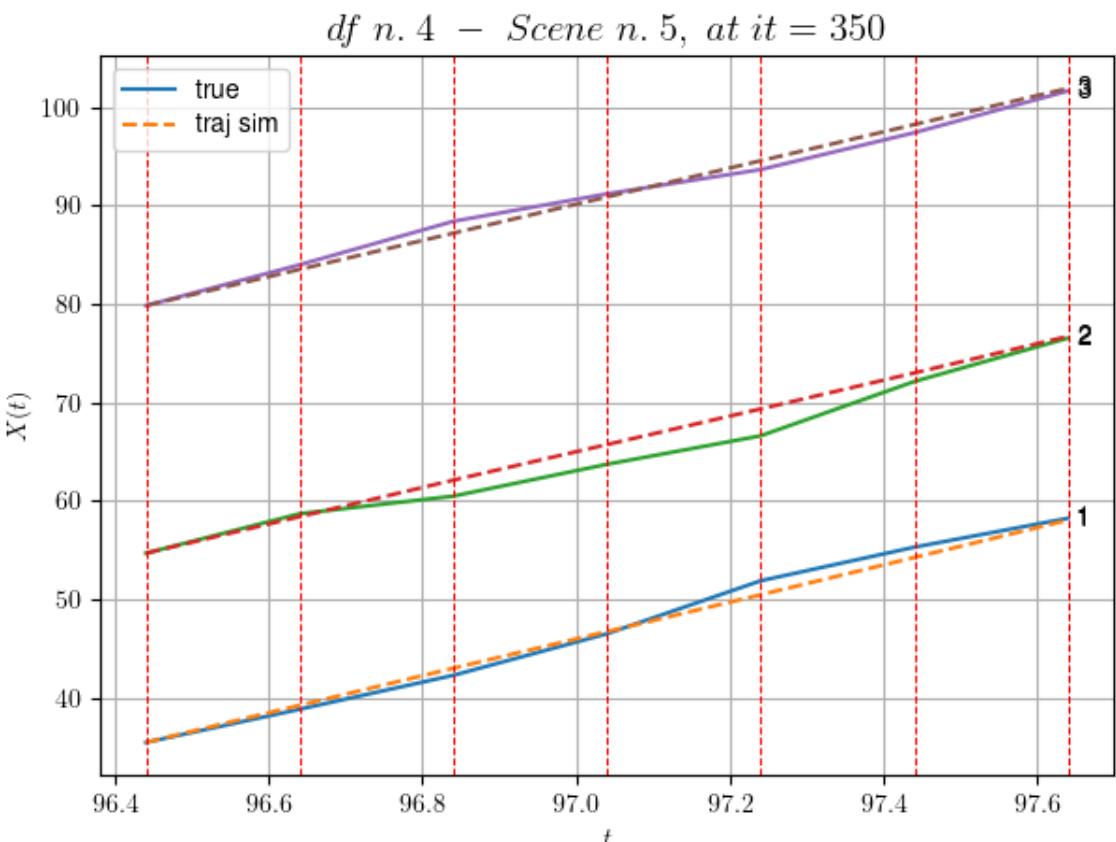
-----  

      * err= 1.057497392183136  

      * Learning rate NN = 3.138104875688441e-05  

      * diff = 0 000734186711085145

```



For scene 5/30

```

* use LR_NN=0.0001 with err=31.826271562678325 at it=19
* v0_scn_mean = 19.39544908947923
* MAE = 1.0052378521540886

```

```
=====
- Time interval n.0: [182.24, 182.44]
  * y_true: [18.61043577 13.125309  ]
  * v_ann: [20.732440948486328, 19.52529525756836, 2
0.77326623858314]

-----
- Time interval n.1: [182.44, 182.64]
  * y_true: [12.51734154 21.64870909]
  * v_ann: [11.055635452270508, 18.970129013061523, 2
0.77326623858314]

-----
- Time interval n.2: [182.64, 182.84]
  * y_true: [15.03048681 24.29091592]
  * v_ann: [20.664936065673828, 18.775903701782227, 2
0.77326623858314]

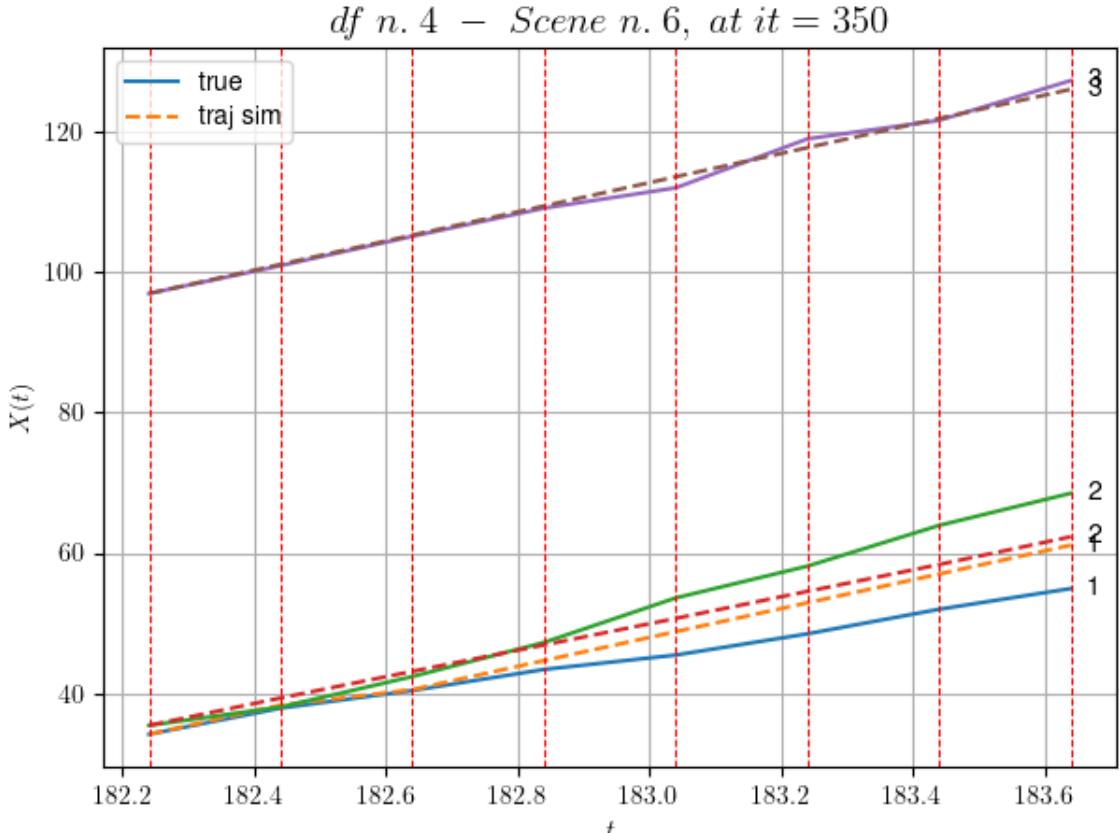
-----
- Time interval n.3: [182.84, 183.04]
  * y_true: [10.23036632 31.71160501]
  * v_ann: [20.612133026123047, 18.905473709106445, 2
0.77326623858314]

-----
- Time interval n.4: [183.04, 183.24]
  * y_true: [15.12061978 22.63128316]
  * v_ann: [20.53850555419922, 19.263858795166016, 2
0.77326623858314]

-----
- Time interval n.5: [183.24, 183.44]
  * y_true: [17.50081627 28.99215837]
  * v_ann: [20.471908569335938, 19.11569595336914, 2
0.77326623858314]

-----
- Time interval n.6: [183.44, 183.64]
  * y_true: [14.74077551 22.90183379]
  * v_ann: [20.573183059692383, 19.76198959350586, 2
0.77326623858314]

-----
* err= 8.11373589297102
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.002301660938975658
```



For scene 6/30

- \* use LR\_NN=0.0001 with err=51.8121132564686 at it=19
- \* v0\_scn\_mean = 21.564062237689768
- \* MAE = 8.0337261308116

---



---

For scene 7/30

- \* use LR\_NN=0.0005 with err=6.99846598630351 at it=19
- \* v0\_scn\_mean = 20.005060843687644
- \* MAE = 0.3494985299054112

---



---

- Time interval n.0: [196.84, 197.04]
- \* y\_true: [ 8.77046468 10.16548364]
- \* v\_ann: [8.901779174804688, 8.759636878967285, 20.188844124320998]

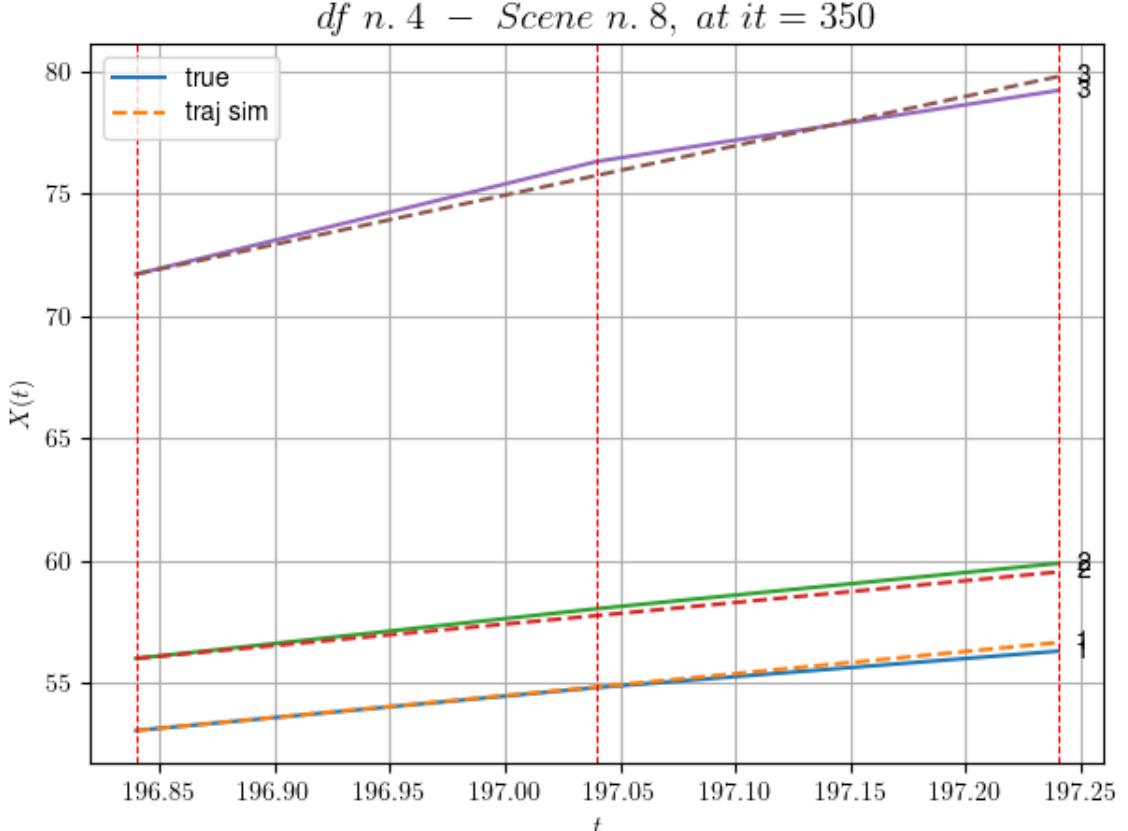
---

- Time interval n.1: [197.04, 197.24]
- \* y\_true: [7.43042623 9.26246532]
- \* v\_ann: [9.060017585754395, 8.905850410461426, 20.188844124320998]

---

- \* err= 0.1083235998450721

\* Learning rate NN = 0.00036449998151510954  
 \* diff = 1.93481586439892e-05



For scene 8/30

\* use LR\_NN=0.0005 with err=3.1726216231027013 at it=19  
 \* v0\_scn\_mean = 21.029729210389316  
 \* MAE = 0.1083235998450721

- 
- 
- Time interval n.0: [222.84, 223.04]
    - \* y\_true: [19.28108097 23.47419597]
    - \* v\_ann: [14.463631629943848, 15.611518859863281, 3 0.107927882855954]

---

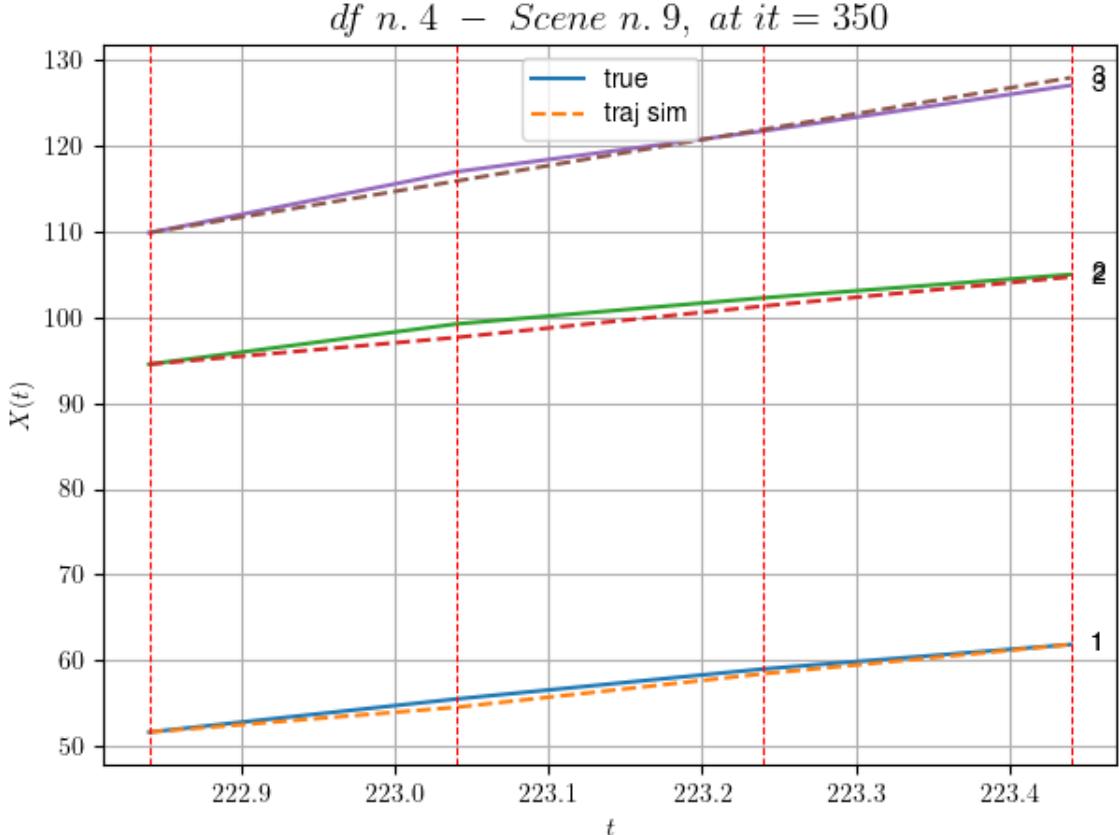
  - Time interval n.1: [223.04, 223.24]
    - \* y\_true: [17.49110618 15.20291758]
    - \* v\_ann: [19.513612747192383, 18.296968460083008, 3 0.107927882855954]

---

  - Time interval n.2: [223.24, 223.44]
    - \* y\_true: [14.25100604 13.59283886]
    - \* v\_ann: [16.993345260620117, 16.934053421020508, 3 0.107927882855954]

---
- \* err= 0.5600832576680278

\* Learning rate NN = 0.0002952449722215533  
 \* diff = a 1020070887003870-05



For scene 9/30

\* use LR\_NN=0.0005 with err=5.373715629684461 at it=19  
 \* v0\_scn\_mean = 30.098677703956003  
 \* MAE = 0.5600832576680278

---



---

- Time interval n.0: [224.84, 225.04]  
 \* y\_true: [17.10046829 25.29311811]  
 \* v\_ann: [18.982511520385742, 19.27849006652832, 1  
 5.713780360625497]

---

- Time interval n.1: [225.04, 225.24]  
 \* y\_true: [17.70062553 10.9614656 ]  
 \* v\_ann: [19.25177001953125, 19.40802764892578, 15.  
 713780360625497]

---

- Time interval n.2: [225.24, 225.44]  
 \* y\_true: [22.57087879 26.33405568]  
 \* v\_ann: [18.633575439453125, 19.18519401550293, 1  
 5.713780360625497]

---

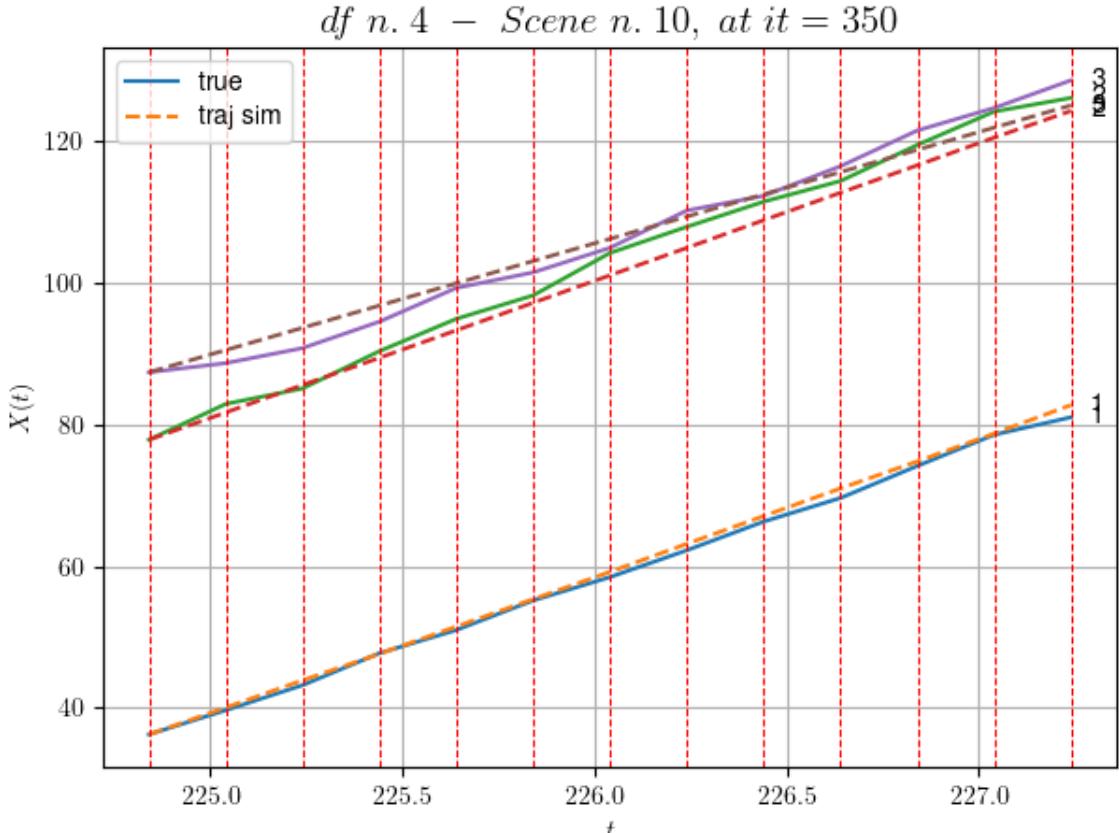
- Time interval n.3: [225.44, 225.64]  
 \* y\_true: [16.35079439 22.81365517]

```
* v_ann: [19.32715606689453, 19.435237884521484, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.4: [225.64, 225.84]  
* y_true: [20.8811317 16.55300892]  
* v_ann: [19.35332489013672, 19.443449020385742, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.5: [225.84, 226.04]  
* y_true: [16.52103304 29.98602504]  
* v_ann: [19.271455764770508, 19.4194393157959, 15.  
713780360625497]  
-----  
-----  
- Time interval n.6: [226.04, 226.24]  
* y_true: [18.95135857 18.46388585]  
* v_ann: [19.77750587463379, 19.38782501220703, 15.  
713780360625497]  
-----  
-----  
- Time interval n.7: [226.24, 226.44]  
* y_true: [20.26160248 17.75418412]  
* v_ann: [19.642704010009766, 19.534156799316406, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.8: [226.44, 226.64]  
* y_true: [16.68150299 14.60353303]  
* v_ann: [19.558931350708008, 19.426376342773438, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.9: [226.64, 226.84]  
* y_true: [22.62228992 25.47686963]  
* v_ann: [19.060850143432617, 19.37028694152832, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.10: [226.84, 227.04]  
* y_true: [22.04244959 23.58655245]  
* v_ann: [19.69832420349121, 19.546836853027344, 1  
5.713780360625497]  
-----  
-----  
- Time interval n.11: [227.04, 227.24]  
* y_true: [12.37151499 9.65291202]  
* v_ann: [20.120698928833008, 18.855215072631836, 1  
5.713780360625497]
```

```

* err= 3.03693103925499
* Learning rate NN = 4.431466732057743e-05
* diff = 0.0018479492089573668

```



For scene 10/30

```

* use LR_NN=0.0005 with err=257.39668681170764 at it=19
* v0_scn_mean = 16.938209896071545
* MAE = 3.03693103925499

```

```

- Time interval n.0: [230.84, 231.04]
  * y_true: [ 5.64695095 17.97864337]
  * v_ann: [7.902956485748291, 13.836896896362305, 2
3.32277125146921]

```

```

- Time interval n.1: [231.04, 231.24]
  * y_true: [ 5.72513489 21.19066695]
  * v_ann: [15.464193344116211, 13.74188232421875, 2
3.32277125146921]

```

```

- Time interval n.2: [231.24, 231.44]
  * y_true: [ 6.01015392 28.29114422]
  * v_ann: [15.304701805114746, 13.655109405517578, 2
3.32277125146921]

```

```

-----  

    - Time interval n.3: [231.44, 231.64]  

      * y_true: [ 6.20016661 18.85086271]  

      * v_ann: [15.125086784362793, 13.892708778381348, 2  

3.32277125146921]  

-----  

    - Time interval n.4: [231.64, 231.84]  

      * y_true: [ 7.13021091 21.11121983]  

      * v_ann: [14.981500625610352, 13.71002197265625, 2  

3.32277125146921]  

-----  

    - Time interval n.5: [231.84, 232.04]  

      * y_true: [ 7.75024044 18.61116554]  

      * v_ann: [14.847274780273438, 13.735138893127441, 2  

3.32277125146921]  

-----  

    - Time interval n.6: [232.04, 232.24]  

      * y_true: [ 8.87530762 21.24160102]  

      * v_ann: [14.727944374084473, 13.703828811645508, 2  

3.32277125146921]  

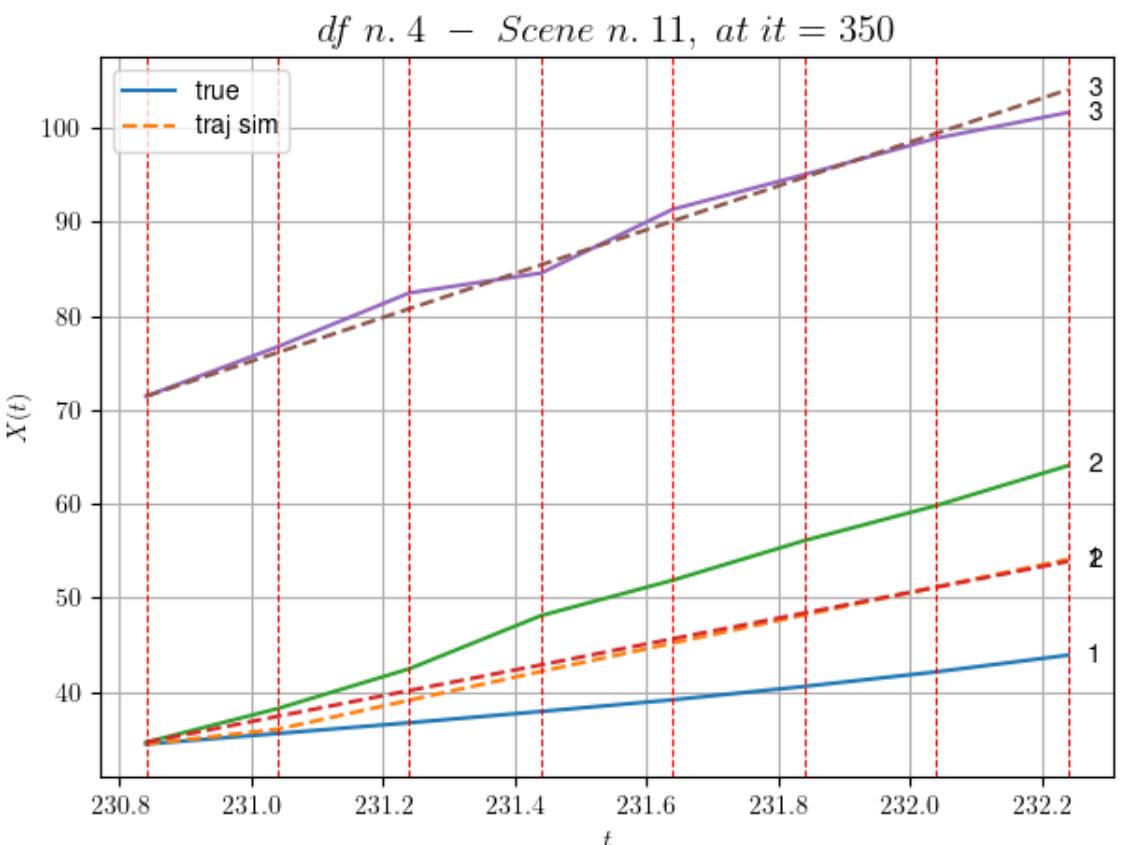
-----  

      * err= 26.153946622480504  

      * Learning rate NN = 1.2709323527815286e-05  

      * diff = 0.0006403795815543845

```



For scene 11/30

\* use LR\_NN=5e-05 with err=20.503877063453277 at it=19

\* v0\_scn\_mean = 23.895056733634004

\* MAE = 26.15243695528504

```
=====
=====

    - Time interval n.0: [233.84, 234.04]
        * y_true: [14.14101026 12.7012637 ]
        * v_ann: [21.26500129699707, 21.8785343170166, 21.4
6286816031553]

-----
-----
    - Time interval n.1: [234.04, 234.24]
        * y_true: [26.43219185 20.11227439]
        * v_ann: [20.97800064086914, 21.50653839111328, 21.
46286816031553]

-----
-----
    - Time interval n.2: [234.24, 234.44]
        * y_true: [22.40209801 33.22429882]
        * v_ann: [21.00277328491211, 21.613109588623047, 2
1.46286816031553]

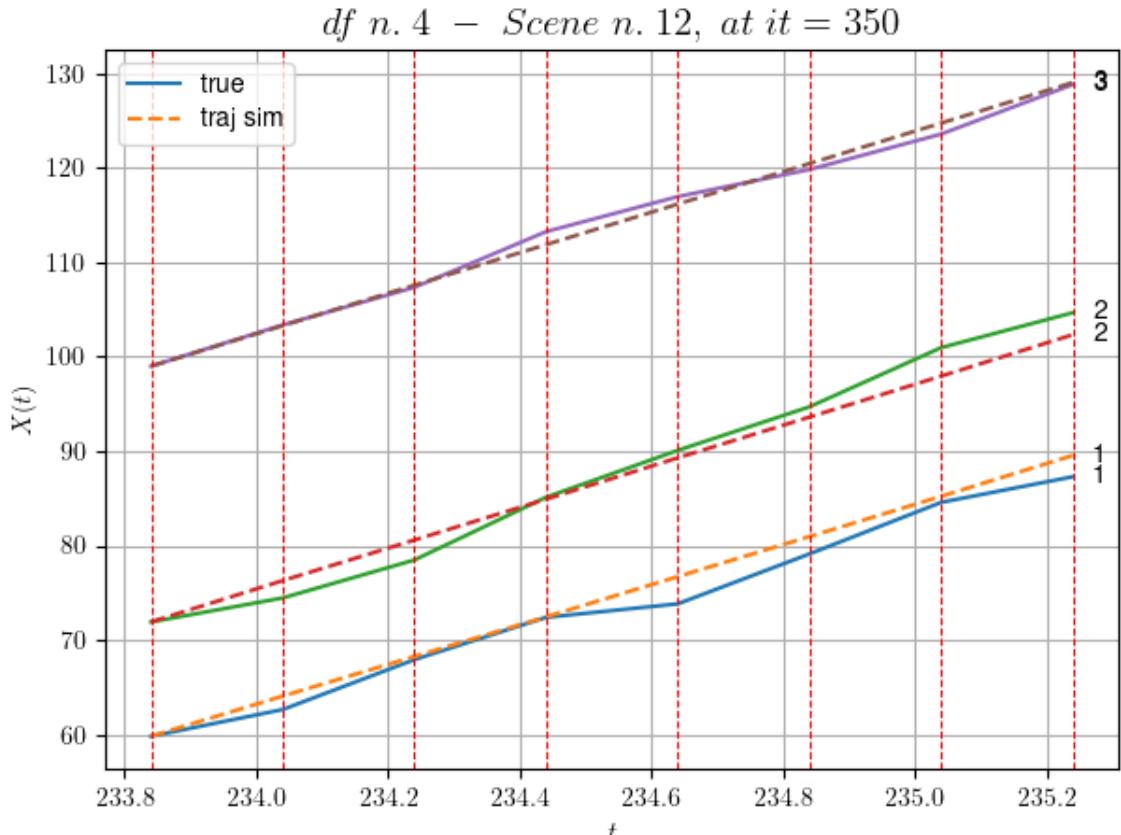
-----
-----
    - Time interval n.3: [234.44, 234.64]
        * y_true: [ 7.15071478 24.83361026]
        * v_ann: [21.29743194580078, 21.930381774902344, 2
1.46286816031553]

-----
-----
    - Time interval n.4: [234.64, 234.84]
        * y_true: [26.44301464 23.06377261]
        * v_ann: [21.216150283813477, 21.574831008911133, 2
1.46286816031553]

-----
-----
    - Time interval n.5: [234.84, 235.04]
        * y_true: [27.303494 31.34578132]
        * v_ann: [21.326091766357422, 21.69085121154785, 2
1.46286816031553]

-----
-----
    - Time interval n.6: [235.04, 235.24]
        * y_true: [13.58189317 18.51369375]
        * v_ann: [21.66880989074707, 21.968294143676758, 2
1.46286816031553]

-----
-----
* err= 1.9976689377230776
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.0010556772807500025
```



For scene 12/30

- \* use LR\_NN=0.0001 with err=34.0777751744181 at it=19
- \* v0\_scn\_mean = 22.19456042295564
- \* MAE = 1.9410808395324388

---



---

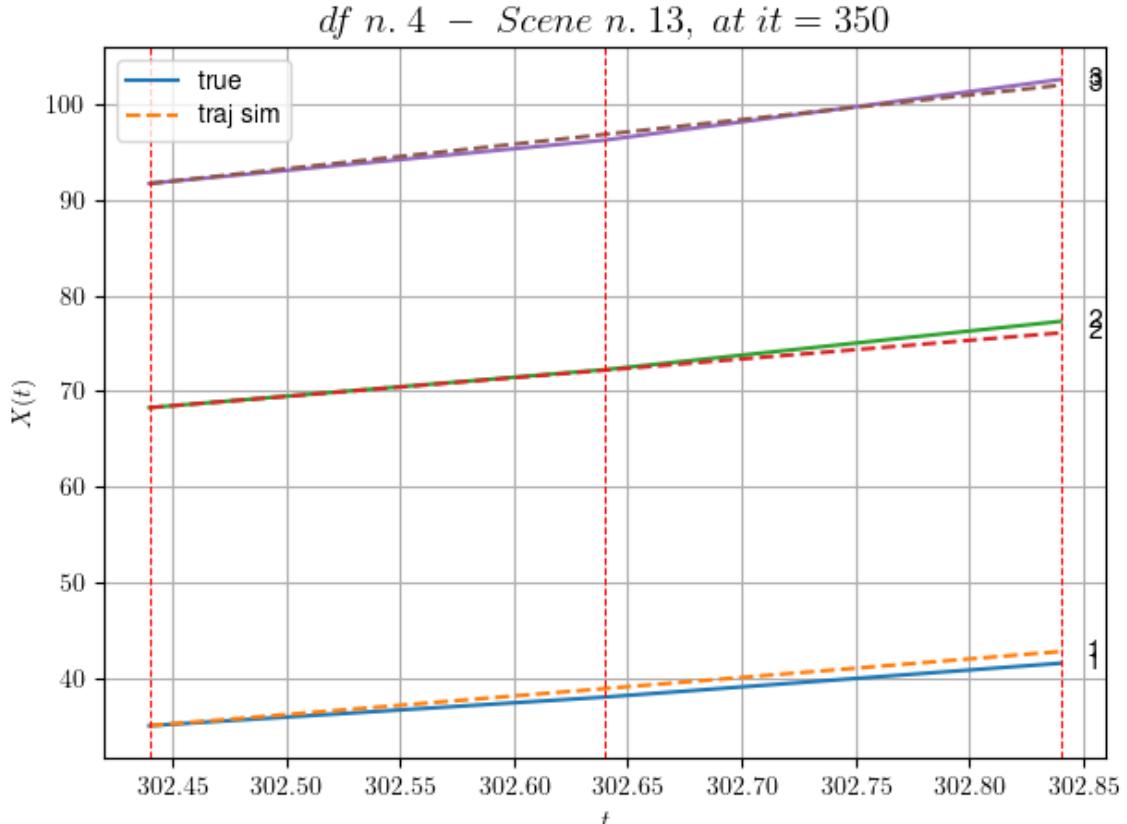
- Time interval n.0: [302.44, 302.64]
- \* y\_true: [15.00036276 19.90190261]
- \* v\_ann: [19.461938858032227, 19.61113166809082, 2  
5.744568982280633]

---

- Time interval n.1: [302.64, 302.84]
- \* y\_true: [17.72492583 25.30273749]
- \* v\_ann: [19.404178619384766, 19.56924057006836, 2  
5.744568982280633]

---

- \* err= 0.4983157296992419
- \* Learning rate NN = 7.289998848136747e-06
- \* diff = 0.0001226256497566247



For scene 13/30

- \* use LR\_NN=1e-05 with err=2.0895548515519153 at it=19
  - \* v0\_scn\_mean = 26.109289360076456
  - \* MAE = 0.4908714444406854
- 
- 

- Time interval n.0: [364.64, 364.84]  
 \* y\_true: [23.68175628 20.26218764]  
 \* v\_ann: [18.4955997467041, 19.04279136657715, 28.2  
 05737859029586]

---

- Time interval n.1: [364.84, 365.04]  
 \* y\_true: [20.38169455 13.81168669]  
 \* v\_ann: [18.77220344543457, 19.12400245666504, 28.  
 205737859029586]

---

- Time interval n.2: [365.04, 365.24]  
 \* y\_true: [10.17092159 27.1635357 ]  
 \* v\_ann: [18.925331115722656, 18.32467269897461, 2  
 8.205737859029586]

---

- Time interval n.3: [365.24, 365.44]  
 \* y\_true: [18.57186597 15.36227914]  
 \* v\_ann: [18.308332443237305, 18.25058937072754, 2

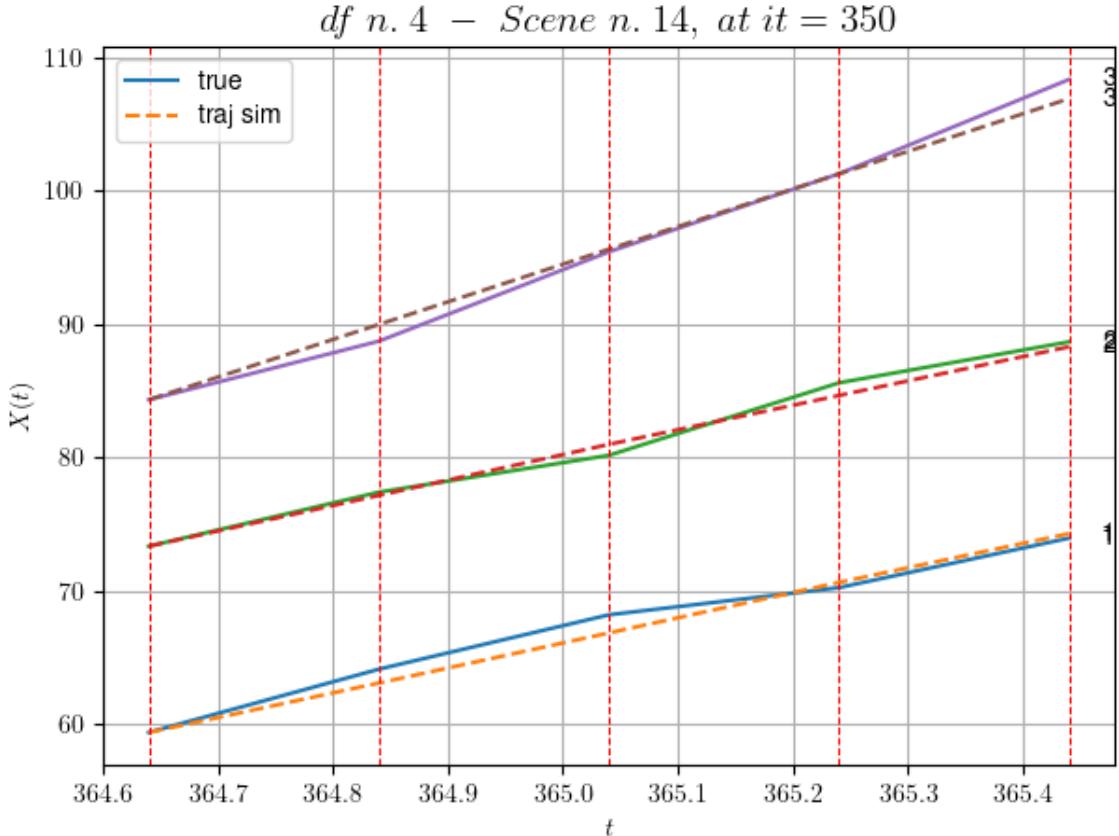
8.205737859029586]

---



---

```
* err= 0.5761347759727147
* Learning rate NN = 4.7829678806010634e-05
* diff = 4.700204272627440e-05
```



For scene 14/30

```
* use LR_NN=0.0001 with err=1.0008948953919887 at it=19
* v0_scn_mean = 28.35951874824957
* MAE = 0.5401080170295156
```

---



---

```
- Time interval n.0: [422.64, 422.84]
* y_true: [18.36052369 19.91162557]
* v_ann: [29.623355865478516, 26.614269256591797, 2
7.54510734654712]
```

---

```
- Time interval n.1: [422.84, 423.04]
* y_true: [28.40107569 15.51150308]
* v_ann: [20.20254898071289, 19.939027786254883, 2
7.54510734654712]
```

---

```
- Time interval n.2: [423.04, 423.24]
* y_true: [26.09121176 24.58263804]
* v_ann: [21.579782485961914, 21.200428009033203, 2
7.54510734654712]
```

---

```

-----  

- Time interval n.3: [423.24, 423.44]  

* y_true: [32.41191994 23.07275882]  

* v_ann: [24.810134887695312, 24.035541534423828, 2  

7.54510734654712]
-----
```

```

-----  

- Time interval n.4: [423.44, 423.64]  

* y_true: [25.31178577 31.31439465]  

* v_ann: [27.50327491760254, 27.02403450012207, 27.  

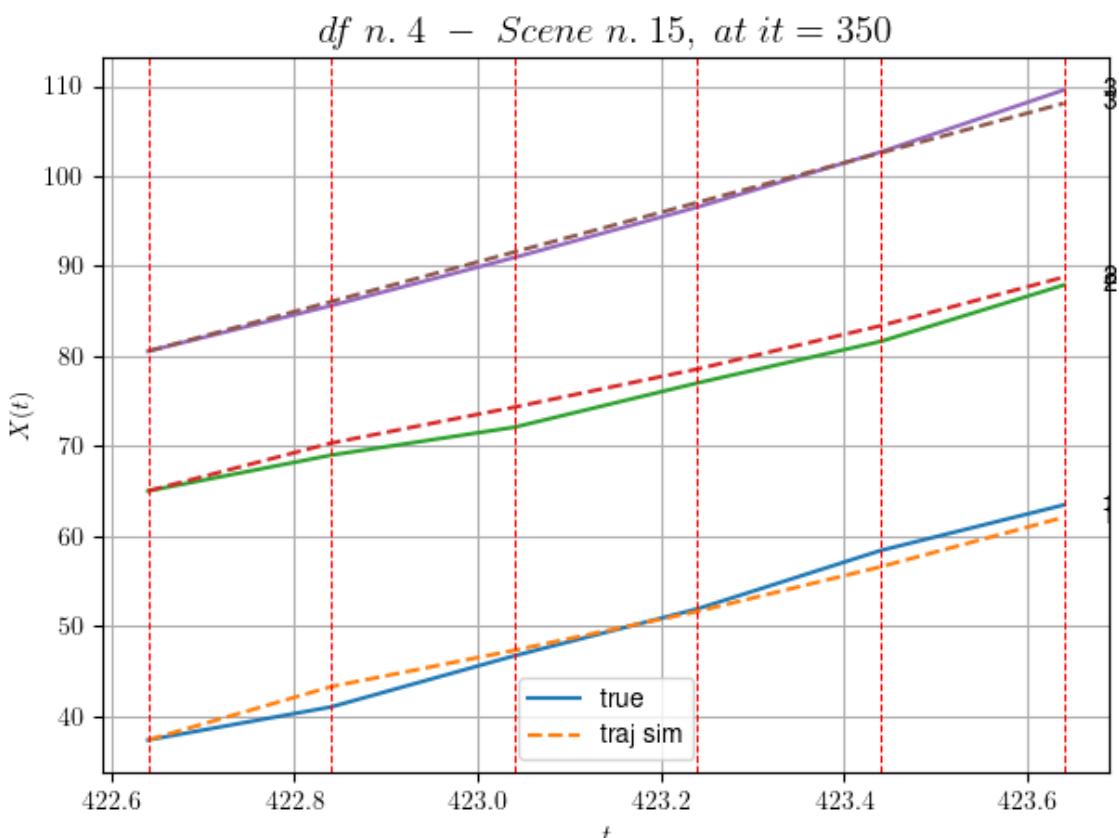
54510734654712]
-----
```

```

* err= 1.4830512272004281  

* Learning rate NN = 0.0003874204121530056  

* diff = 0.003062803836367589
```



For scene 15/30

```

* use LR_NN=0.001 with err=2.5308485009100923 at it=19  

* v0_scn_mean = 27.755508918629317  

* MAE = 1.1619940682095928
=====
```

```

-----  

- Time interval n.0: [440.44, 440.64]  

* y_true: [23.50209477 27.05306951]  

* v_ann: [20.466707229614258, 21.026504516601562, 2  

1.127058612420328]
```

```

-----  

-----  

    - Time interval n.1: [440.64, 440.84]  

      * y_true: [ 8.15079495 24.70319187]  

      * v_ann: [20.67068099975586, 21.15736198425293, 21.  

127058612420328]  

-----  

-----
```

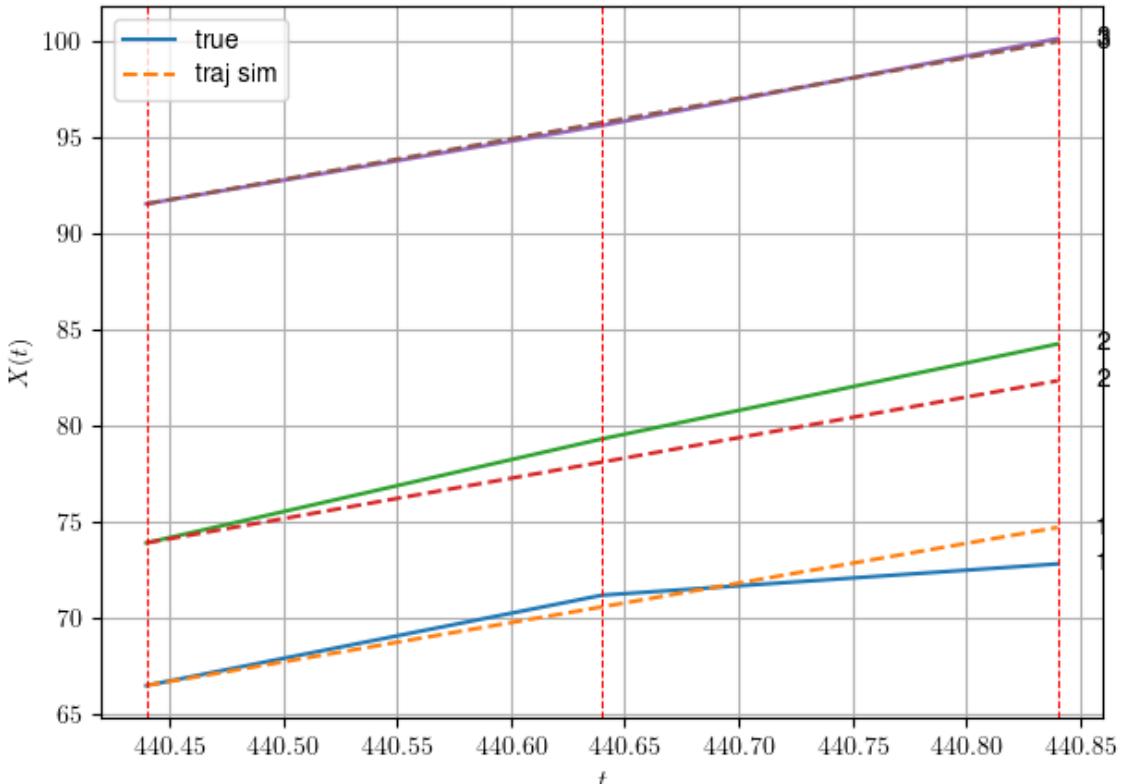
```

* err= 1.0144672096961662  

* Learning rate NN = 3.6449993785936385e-05  

* diff = 0.0009475913039873607
```

*df n. 4 – Scene n. 16, at it = 350*



For scene 16/30

```

* use LR_NN=5e-05 with err=2.892376923398054 at it=19  

* v0_scn_mean = 21.88753211594238  

* MAE = 0.9776222551652792
```

```

=====  

=====  

-----  

-----  

    - Time interval n.0: [459.64, 459.84]  

      * y_true: [ 8.02057991 18.30147717]  

      * v_ann: [17.83915138244629, 21.151182174682617, 2  

1.749537222117453]  

-----  

-----
```

```

-----  

-----  

    - Time interval n.1: [459.84, 460.04]  

      * y_true: [15.90126261 32.50305135]  

      * v_ann: [16.662813186645508, 19.022382736206055, 2  

1.749537222117453]
```

```

-----  

- Time interval n.2: [460.04, 460.24]  

* y_true: [12.56106954 7.60079575]  

* v_ann: [19.867801666259766, 19.712236404418945, 2  

1.749537222117453]
-----
```

```

-----  

- Time interval n.3: [460.24, 460.44]  

* y_true: [22.47215871 13.7515264 ]  

* v_ann: [16.249643325805664, 17.792388916015625, 2  

1.749537222117453]
-----
```

```

-----  

- Time interval n.4: [460.44, 460.64]  

* y_true: [12.66130245 40.10510628]  

* v_ann: [16.090078353881836, 19.522497177124023, 2  

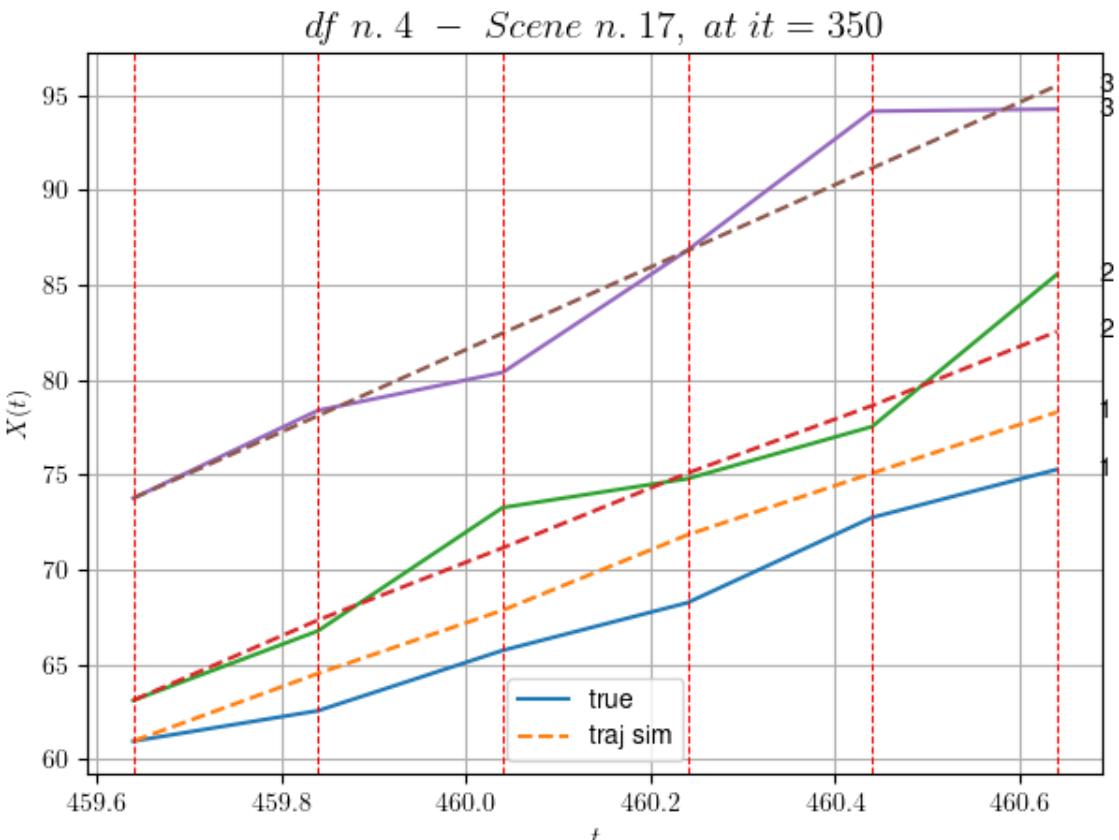
1.749537222117453]
-----
```

```

* err= 3.6566980125613107  

* Learning rate NN = 0.0003874204121530056  

* diff = 0.00981669618431491
```



For scene 17/30  
\* use LR\_NN=0.001 with err=10.859830912170326 at it=19  
\* v0\_scn\_mean = 22.456659929267367  
\* MAE = 3.6566980125613107

```
- Time interval n.0: [493.84, 494.04]
  * y_true: [22.94003108 21.75102788]
  * v_ann: [22.783119201660156, 23.046480178833008, 2
0.437010740209942]

-----
- Time interval n.1: [494.04, 494.24]
  * y_true: [17.14085991 24.35137427]
  * v_ann: [22.728816986083984, 22.980932235717773, 2
0.437010740209942]

-----
- Time interval n.2: [494.24, 494.44]
  * y_true: [21.88131212 25.00167951]
  * v_ann: [22.5748291015625, 22.695167541503906, 20.
437010740209942]

-----
- Time interval n.3: [494.44, 494.64]
  * y_true: [18.45125037 31.00249487]
  * v_ann: [22.656829833984375, 22.79597282409668, 2
0.437010740209942]

-----
- Time interval n.4: [494.64, 494.84]
  * y_true: [23.98189292 7.35066295]
  * v_ann: [22.905420303344727, 22.92844009399414, 2
0.437010740209942]

-----
- Time interval n.5: [494.84, 495.04]
  * y_true: [24.94226236 24.20238954]
  * v_ann: [22.187198638916016, 22.188730239868164, 2
0.437010740209942]

-----
- Time interval n.6: [495.04, 495.24]
  * y_true: [23.43243252 31.70363737]
  * v_ann: [22.392858505249023, 22.453197479248047, 2
0.437010740209942]

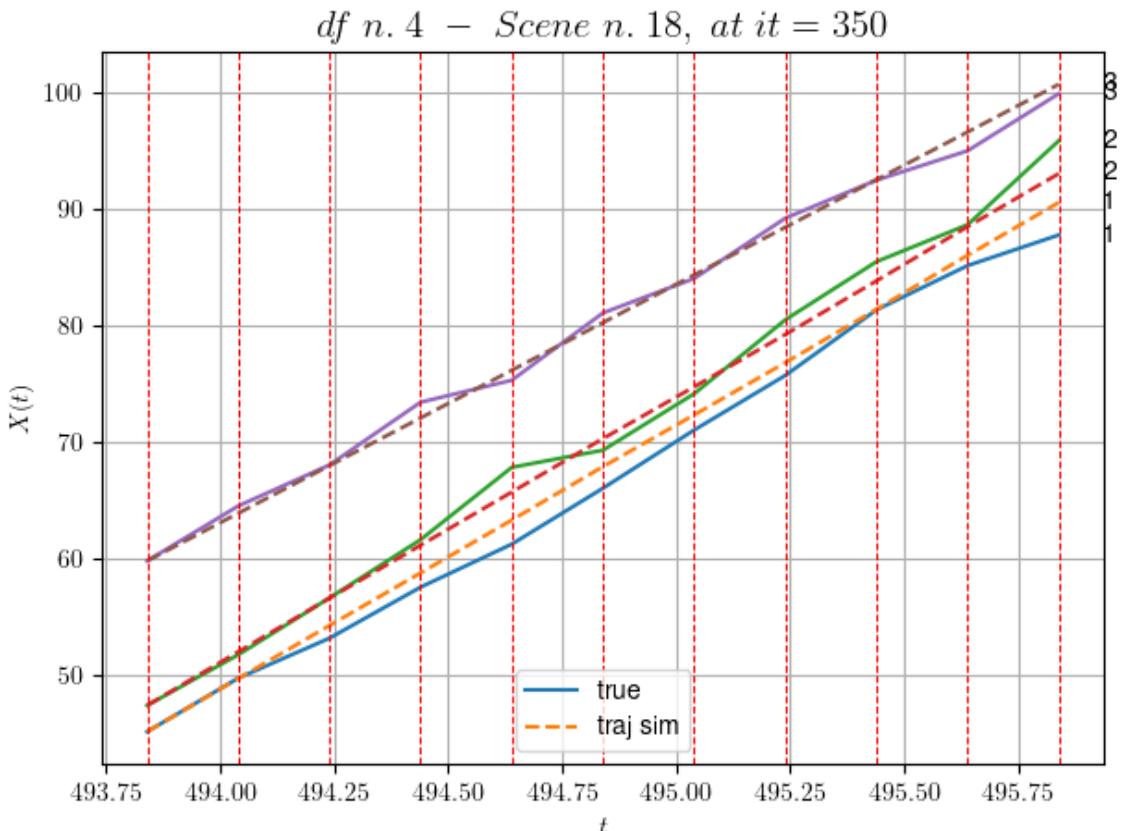
-----
- Time interval n.7: [495.24, 495.44]
  * y_true: [28.10335872 24.95329593]
  * v_ann: [22.873931884765625, 22.97551918029785, 2
0.437010740209942]

-----
- Time interval n.8: [495.44, 495.64]
  * y_true: [18.99250639 15.85230368]
```

```
* v_ann: [23.18244743347168, 23.292095184326172, 2
0.437010740209942]

-----
- Time interval n.9: [495.64, 495.84]
* y_true: [13.12188353 36.00587838]
* v_ann: [22.65799903869629, 22.718017578125, 20.43
7010740209942]

-----
* err= 1.4485208432044683
* Learning rate NN = 0.00013508510892279446
* diff = 0.00031617451428544996
```



For scene 18/30

```
* use LR_NN=0.001 with err=81.22631657257381 at it=19
* v0_scn_mean = 21.25662620129171
* MAE = 1.4478904971464706
```

```
=====
=====

- Time interval n.0: [520.04, 520.24]
* y_true: [17.72000935 17.53021327]
* v_ann: [21.093599319458008, 20.88484764099121, 2
5.9628364992539]

=====
- Time interval n.1: [520.24, 520.44]
* y_true: [21.19003079 20.68032877]
* v_ann: [21.076528549194336, 20.826923370361328, 2
```

5.9628364992539]

- Time interval n.2: [520.44, 520.64]  
\* y\_true: [20.95006602 20.21041565]  
\* v\_ann: [21.077749252319336, 20.82799530029297, 2

5.9628364992539]

- Time interval n.3: [520.64, 520.84]  
\* y\_true: [19.83010584 22.72061589]  
\* v\_ann: [21.07757568359375, 20.79967498779297, 25.

9628364992539]

- Time interval n.4: [520.84, 521.04]  
\* y\_true: [18.57015207 20.87066157]  
\* v\_ann: [21.073320388793945, 20.809425354003906, 2

5.9628364992539]

- Time interval n.5: [521.04, 521.24]  
\* y\_true: [19.76022757 18.03074501]  
\* v\_ann: [21.061542510986328, 20.768278121948242, 2

5.9628364992539]

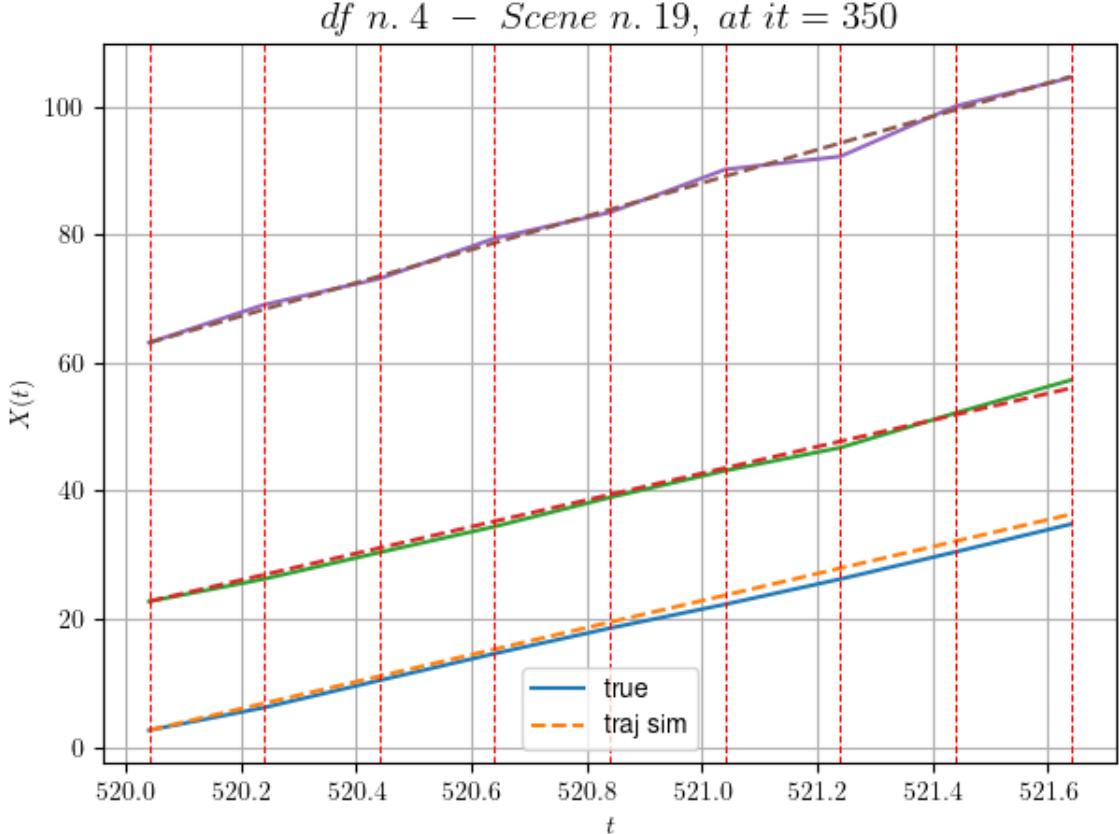
- Time interval n.6: [521.24, 521.44]  
\* y\_true: [21.18033214 27.03127071]  
\* v\_ann: [21.053911209106445, 20.763078689575195, 2

5.9628364992539]

- Time interval n.7: [521.44, 521.64]  
\* y\_true: [21.65044512 25.69152055]  
\* v\_ann: [21.059581756591797, 20.772911071777344, 2

5.9628364992539]

\* err= 0.892655854877311  
\* Learning rate NN = 2.058910467894748e-06  
\* diff = 0.0028057951899154165



For scene 19/30

\* use LR\_NN=1e-05 with err=32.12457610183869 at it=19  
 \* v0\_scn\_mean = 26.30884981519874  
 \* MAE = 0.892655854877311

---



---

For scene 20/30

\* use LR\_NN=0.001 with err=15.454741855357307 at it=19  
 \* v0\_scn\_mean = 21.16747375536085  
 \* MAE = 0.329550092626711

---



---

- Time interval n.0: [554.64, 554.84]  
 \* y\_true: [16.3871362 34.43556815]  
 \* v\_ann: [23.44858169555664, 22.93804359436035, 20.  
 44079689246173]

---

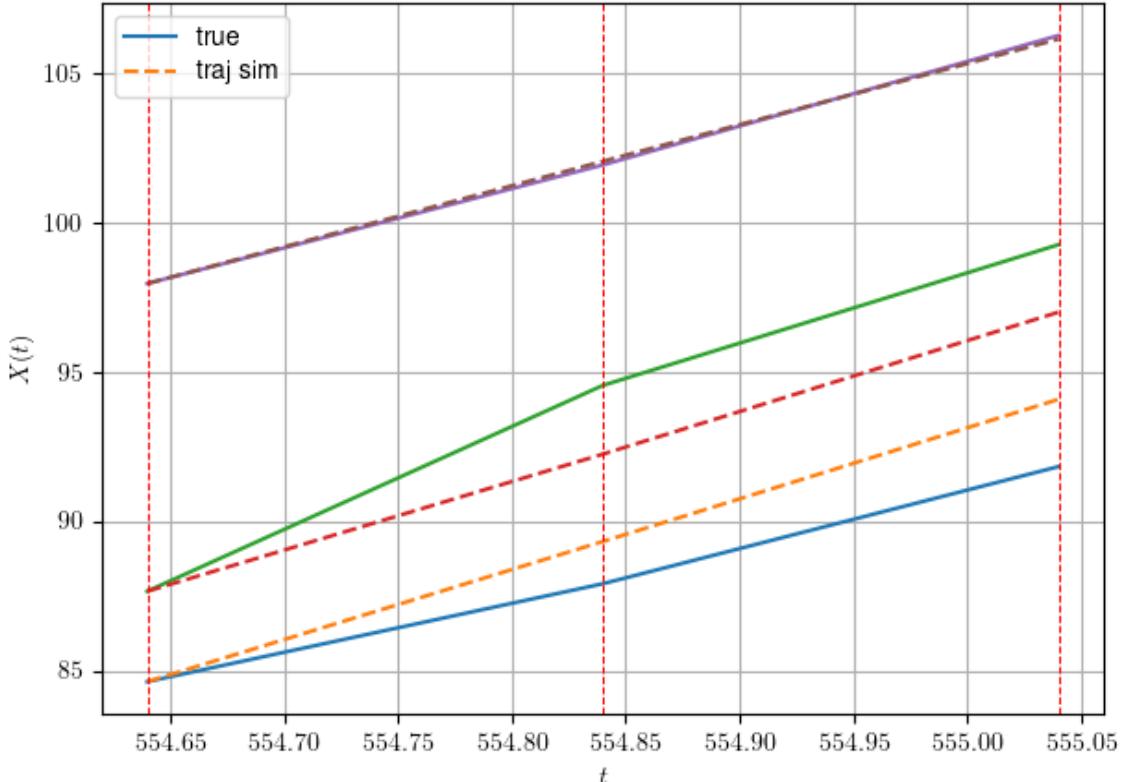
- Time interval n.1: [554.84, 555.04]  
 \* y\_true: [19.58824641 23.53414882]  
 \* v\_ann: [23.780370712280273, 23.745227813720703, 2  
 0.44079689246173]

---

\* err= 1.941423762718917

\* Learning rate NN = 0.00036449998151510954  
 \* diff = 7.017703769274242e-05

*df n. 4 – Scene n. 21, at it = 350*



For scene 21/30

\* use LR\_NN=0.0005 with err=2.570746740595855 at it=19  
 \* v0\_scn\_mean = 21.260087853656614  
 \* MAE = 1.9392025784403826

---



---

- Time interval n.0: [556.24, 556.44]  
 \* y\_true: [24.75252122 21.70224237]  
 \* v\_ann: [23.935415267944336, 24.23896598815918, 1  
 5.086200202026637]

---



---

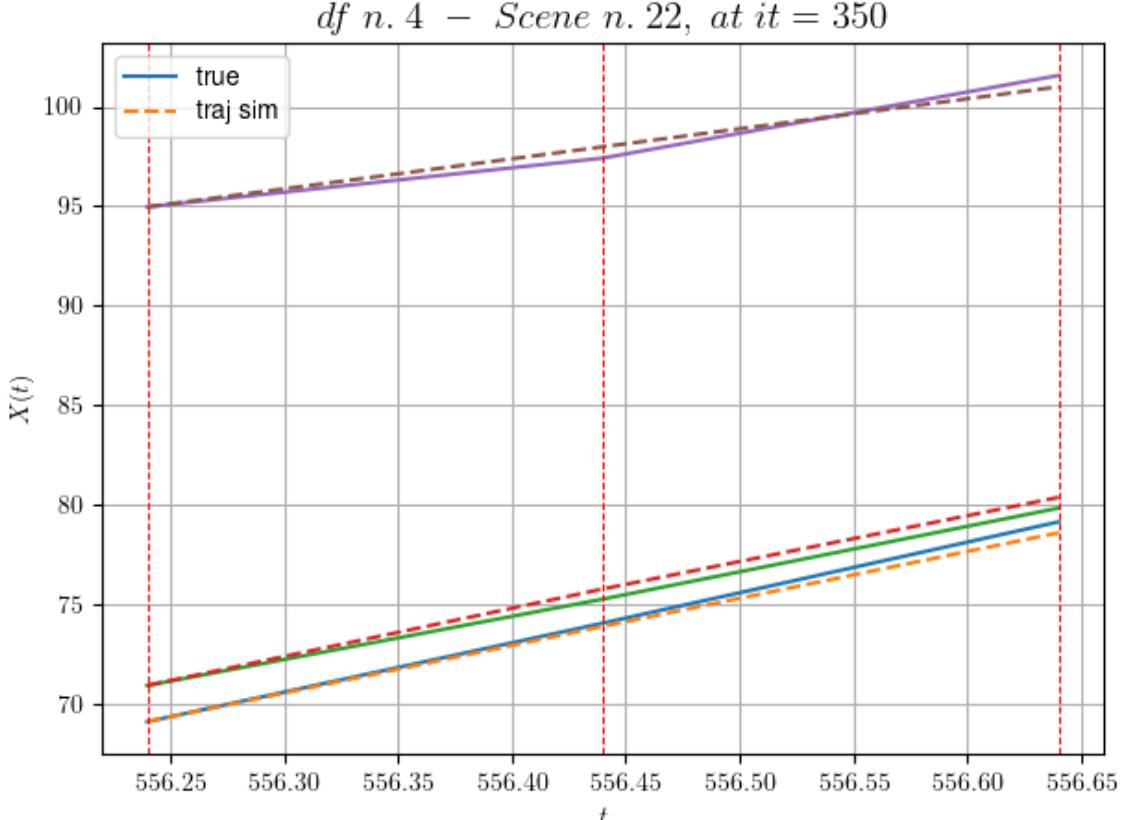
- Time interval n.1: [556.44, 556.64]  
 \* y\_true: [25.4427559 22.85265518]  
 \* v\_ann: [23.52485466003418, 23.008695602416992, 1  
 5.086200202026637]

---



---

\* err= 0.16842437088719378  
 \* Learning rate NN = 0.0007289999630302191  
 \* diff = 6.983634945889605e-07



For scene 22/30

- \* use LR\_NN=0.001 with err=13.029680606619173 at it=19
- \* v0\_scn\_mean = 16.36441777247632
- \* MAE = 0.16792916030847482

---



---

- Time interval n.0: [575.04, 575.24]
- \* y\_true: [25.50060057 18.90068968]
- \* v\_ann: [22.476240158081055, 22.562705993652344, 2

4.545660919825707]

---

- Time interval n.1: [575.24, 575.44]
- \* y\_true: [27.95087423 28.65128625]
- \* v\_ann: [22.460796356201172, 22.49589729309082, 2

4.545660919825707]

---

- Time interval n.2: [575.44, 575.64]
- \* y\_true: [21.25083564 15.85084753]
- \* v\_ann: [22.692808151245117, 23.643346786499023, 2

4.545660919825707]

---

- Time interval n.3: [575.64, 575.84]
- \* y\_true: [32.20158375 11.5506833 ]
- \* v\_ann: [22.499998092651367, 22.71405792236328, 2

4.545660919825707]

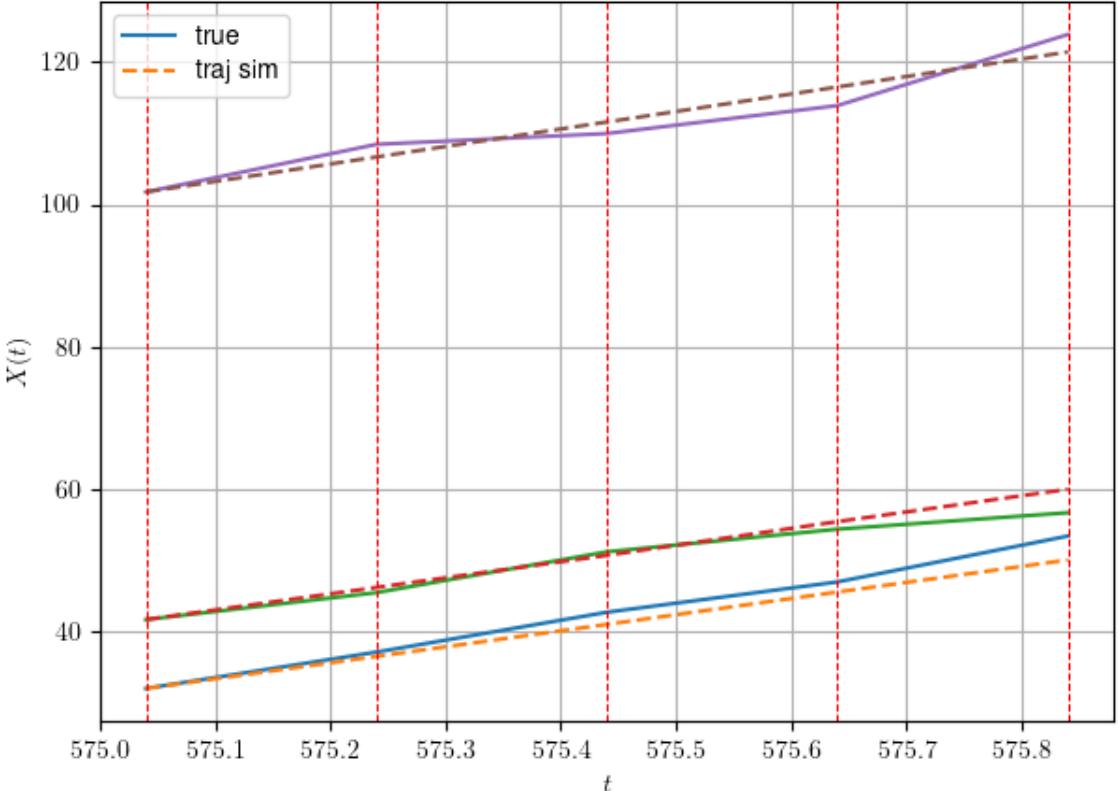
---



---

```
* err= 3.193273148883558
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.001127545276500727
```

*df n. 4 – Scene n. 23, at it = 350*

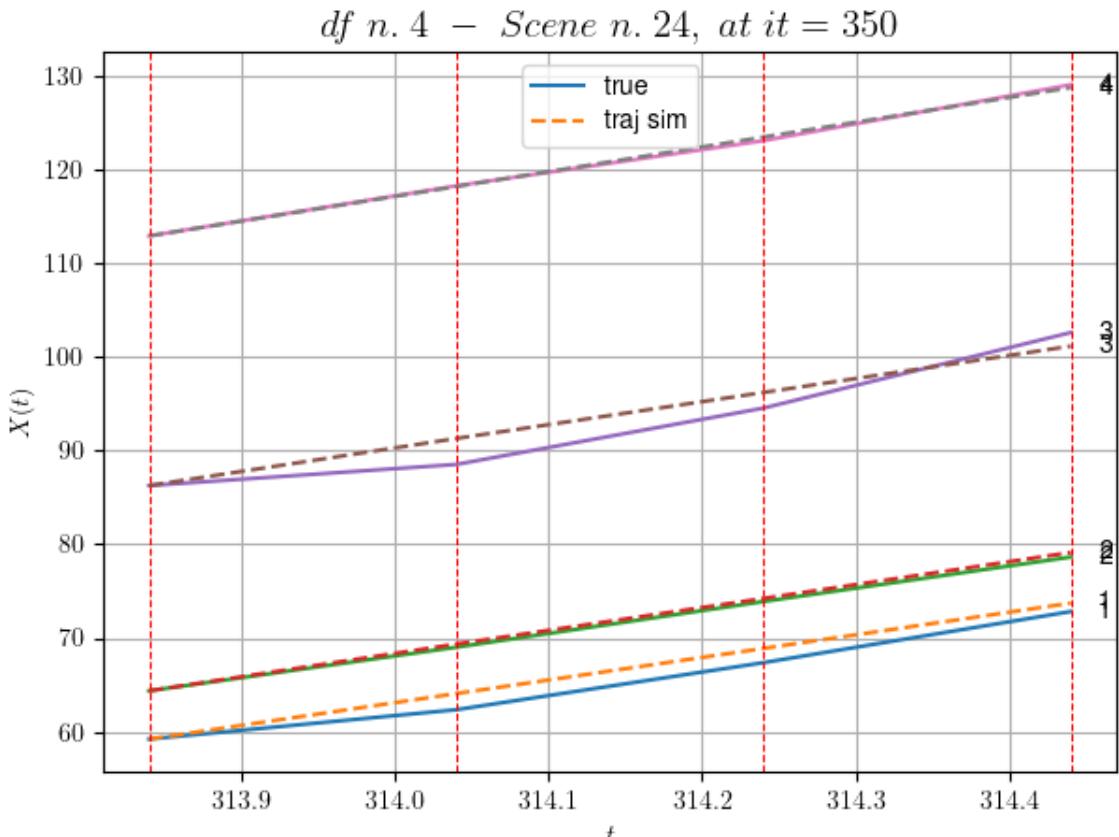


For scene 23/30

```
* use LR_NN=5e-05 with err=42.917657352353565 at it=19
* v0_scn_mean = 25.013136153630082
* MAE = 3.191201099098656
```

- 
- 
- Time interval n.0: [313.84, 314.04]
    - \* y\_true: [15.70108851 23.28855659 11.30165534]
    - \* v\_ann: [24.328149795532227, 24.977123260498047, 2  
5.160602569580078, 26.416039076566552]
- 
- 
- Time interval n.1: [314.04, 314.24]
    - \* y\_true: [25.15198981 24.43240479 30.10483754]
    - \* v\_ann: [24.127243041992188, 24.385082244873047, 2  
4.590362548828125, 26.416039076566552]
- 
- 
- Time interval n.2: [314.24, 314.44]
    - \* y\_true: [27.30252596 23.75264682 40.35752125]
    - \* v\_ann: [24.192663192749023, 24.545360565185547, 2  
4.742509841918945, 26.416039076566552]

```
* err= 1.2121796301111685
* Learning rate NN = 2.952449540316593e-05
* diff = 0.0004935679695587947
```



For scene 24/30

```
* use LR_NN=5e-05 with err=10.961655675112318 at it=19
* v0_scn_mean = 26.82511486044959
* MAE = 1.1832024625135158
```

For scene 25/30

```
* use LR_NN=0.001 with err=3.1656048871926306 at it=19
* v0_scn_mean = 26.868082635913034
* MAE = 0.12956956818429424
```

For scene 26/30

```
* use LR_NN=0.001 with err=8.274917556834 at it=19
* v0_scn_mean = 31.178009845928273
* MAE = 0.27682398359838734
```

```

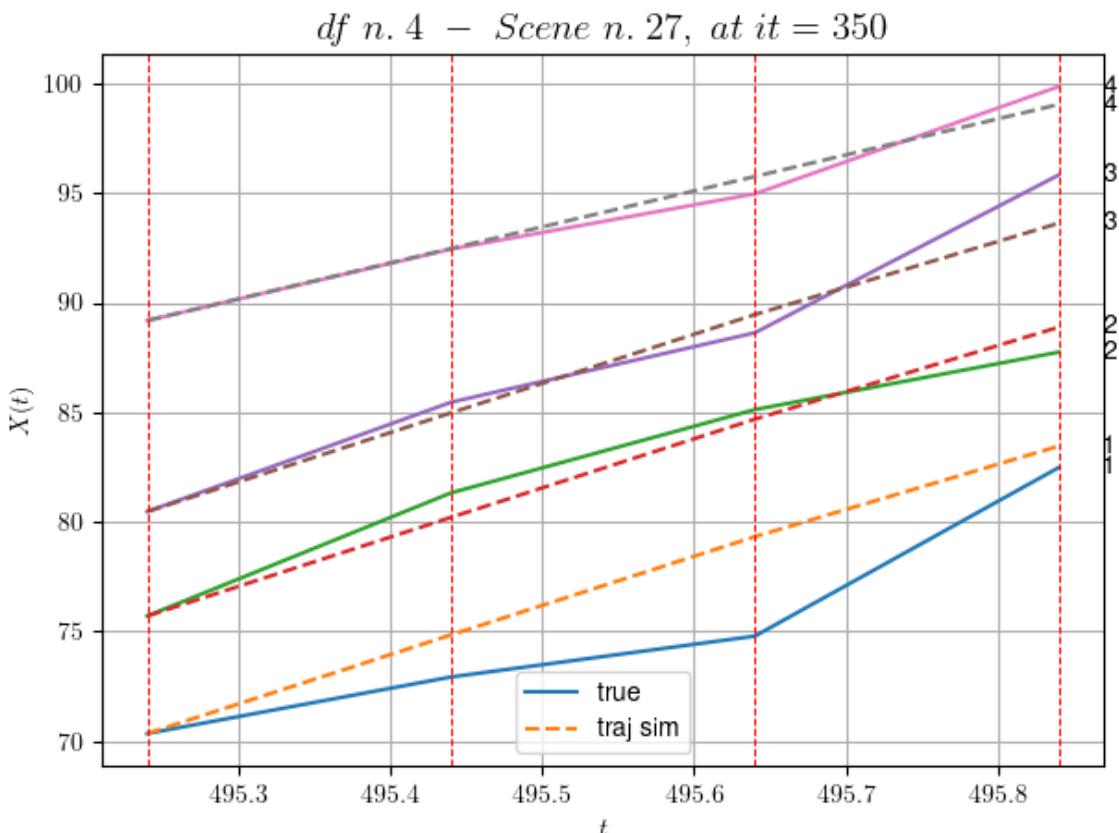
- Time interval n.0: [495.24, 495.44]
  * y_true: [12.91123632 28.10335872 24.95329593]
  * v_ann: [22.51409149169922, 22.509916305541992, 2
  2.537460327148438, 16.439733421153665]

-----
- Time interval n.1: [495.44, 495.64]
  * y_true: [ 9.32105302 18.99250639 15.85230368]
  * v_ann: [22.41901969909668, 22.405317306518555, 2
  2.414478302001953, 16.439733421153665]

-----
- Time interval n.2: [495.64, 495.84]
  * y_true: [38.46439916 13.12188353 36.00587838]
  * v_ann: [20.657575607299805, 20.99472427368164, 2
  0.854780197143555, 16.439733421153665]

* err= 2.1909380596303887
* Learning rate NN = 0.0002952449722215533
* diff = 0.00010556373558845422

```



For scene 27/30  
 \* use LR\_NN=0.0005 with err=10.329564933750362 at it=19  
 \* v0\_scn\_mean = 17.987511647231237  
 \* MAE = 2.1787576653000276

```
- Time interval n.0: [541.84, 542.04]
  * y_true: [15.49040827 18.57067001 15.06113134]
  * v_ann: [18.873891830444336, 18.97077178955078, 1
8.96884536743164, 25.31225808344175]

-----
-----
```

- Time interval n.1: [542.04, 542.24]  
\* y\_true: [18.02057424 22.22093452 14.29121645]  
\* v\_ann: [18.079965591430664, 17.535573959350586, 1  
7.447664260864258, 25.31225808344175]

```
-----
```

- Time interval n.2: [542.24, 542.44]  
\* y\_true: [23.32090187 15.10072652 30.16295254]  
\* v\_ann: [18.21739387512207, 17.885873794555664, 1  
7.723102569580078, 25.31225808344175]

```
-----
```

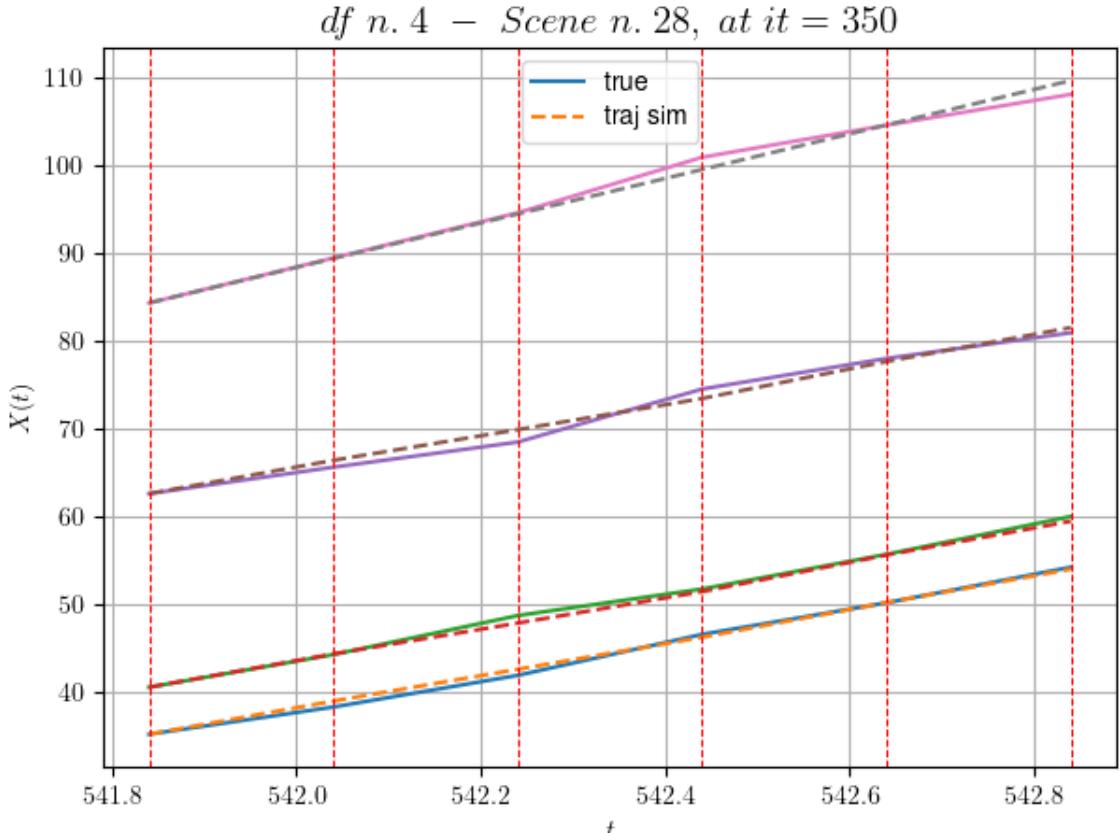
- Time interval n.3: [542.44, 542.64]  
\* y\_true: [17.96079787 19.72113387 17.42186984]  
\* v\_ann: [19.73570442199707, 20.817096710205078, 2  
1.039453506469727, 25.31225808344175]

```
-----
```

- Time interval n.4: [542.64, 542.84]  
\* y\_true: [20.261096 21.55138585 14.58174174]  
\* v\_ann: [19.00217056274414, 19.23596954345703, 19.  
295095443725586, 25.31225808344175]

```
-----
```

\* err= 0.45348749346666206  
\* Learning rate NN = 0.0003874204121530056  
\* diff = 1 10315360650002520.05



For scene 28/30

- \* use LR\_NN=0.001 with err=18.53927221933096 at it=19
- \* v0\_scn\_mean = 25.847320194922375
- \* MAE = 0.45348749346666206

---



---

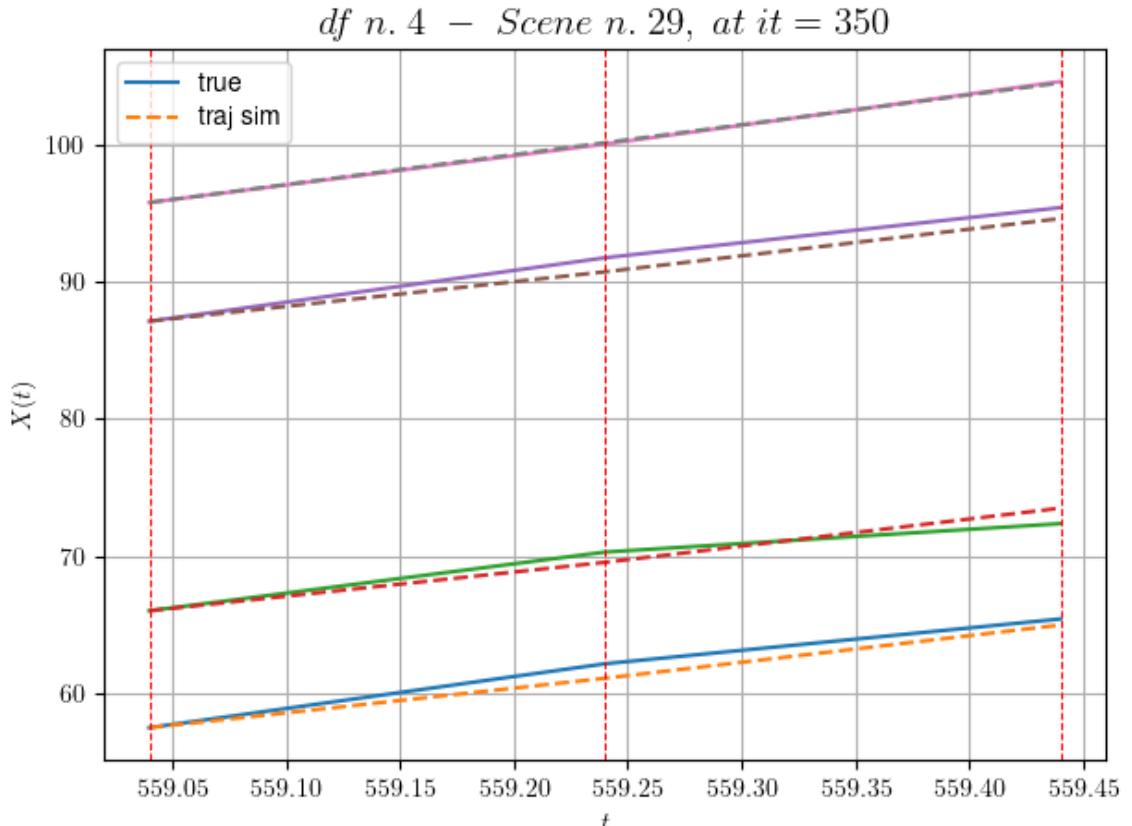
- Time interval n.0: [559.04, 559.24]
- \* y\_true: [23.32160164 21.40183754 23.15354324]
- \* v\_ann: [18.03650665283203, 17.659549713134766, 1  
8.032609939575195, 21.821996764913898]

---

- Time interval n.1: [559.24, 559.44]
- \* y\_true: [16.34126249 10.38103794 18.30306556]
- \* v\_ann: [19.429094314575195, 19.772546768188477, 1  
9.43281364440918, 21.821996764913898]

---

- \* err= 0.40455116023815985
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 1.5496389195068794e-05



For scene 29/30

- \* use LR\_NN=0.0005 with err=6.056725205738317 at it=19
- \* v0\_scn\_mean = 22.755439722429795
- \* MAE = 0.40385254154018235

---



---

For df=4 with 30 scenes, time taken: 385.53

---



---

In df n.5/10 we have 14 scenes

---



---

- Time interval n.0: [23.72, 23.92]
  - \* y\_true: [21.79018354 24.07032953]
  - \* v\_ann: [20.854248046875, 18.62174415588379, 24.534843225110123]
  
- Time interval n.1: [23.92, 24.12]
  - \* y\_true: [25.91031727 27.52052784]
  - \* v\_ann: [22.22658348083496, 22.547828674316406, 24.534843225110123]
  
- Time interval n.2: [24.12, 24.32]

```

* y_true: [19.61033273 24.42062846]
* v_ann: [24.228469848632812, 27.377010345458984, 2
4.534843225110123]

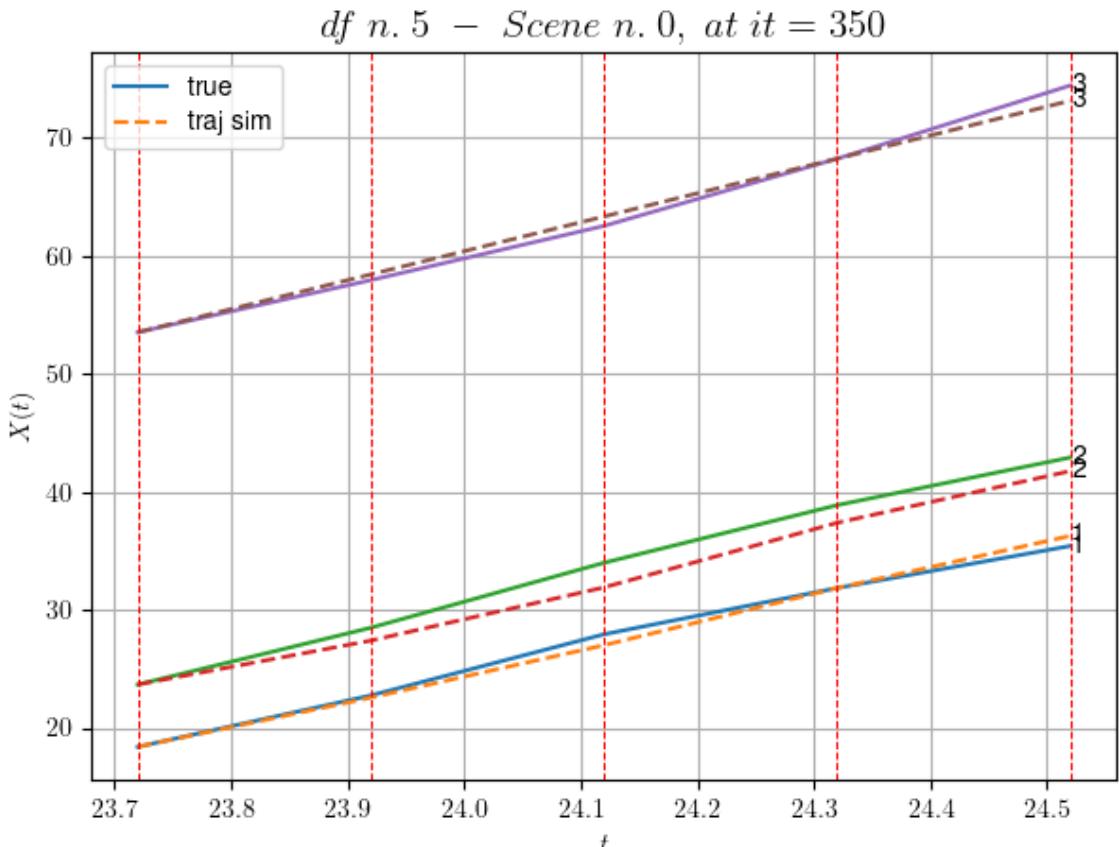
-----
- Time interval n.3: [24.32, 24.52]
* y_true: [17.8304062 20.21066815]
* v_ann: [22.1157283782959, 21.931495666503906, 24.
534843225110123]

```

```

* err= 0.8833176956415455
* Learning rate NN = 0.000478296831715852
* diff = 0.00010407012750122522

```



For scene 0/14

```

* use LR_NN=0.001 with err=22.37991914450245 at it=19
* v0_scn_mean = 25.003245611461182
* MAE = 0.3978076498477055

```

```

=====
=====
- Time interval n.0: [28.12, 28.32]
* y_true: [22.39001619 28.9506918 ]
* v_ann: [26.571012496948242, 26.080366134643555, 2
5.379417180280765]

```

```

=====
- Time interval n.1: [28.32, 28.52]

```

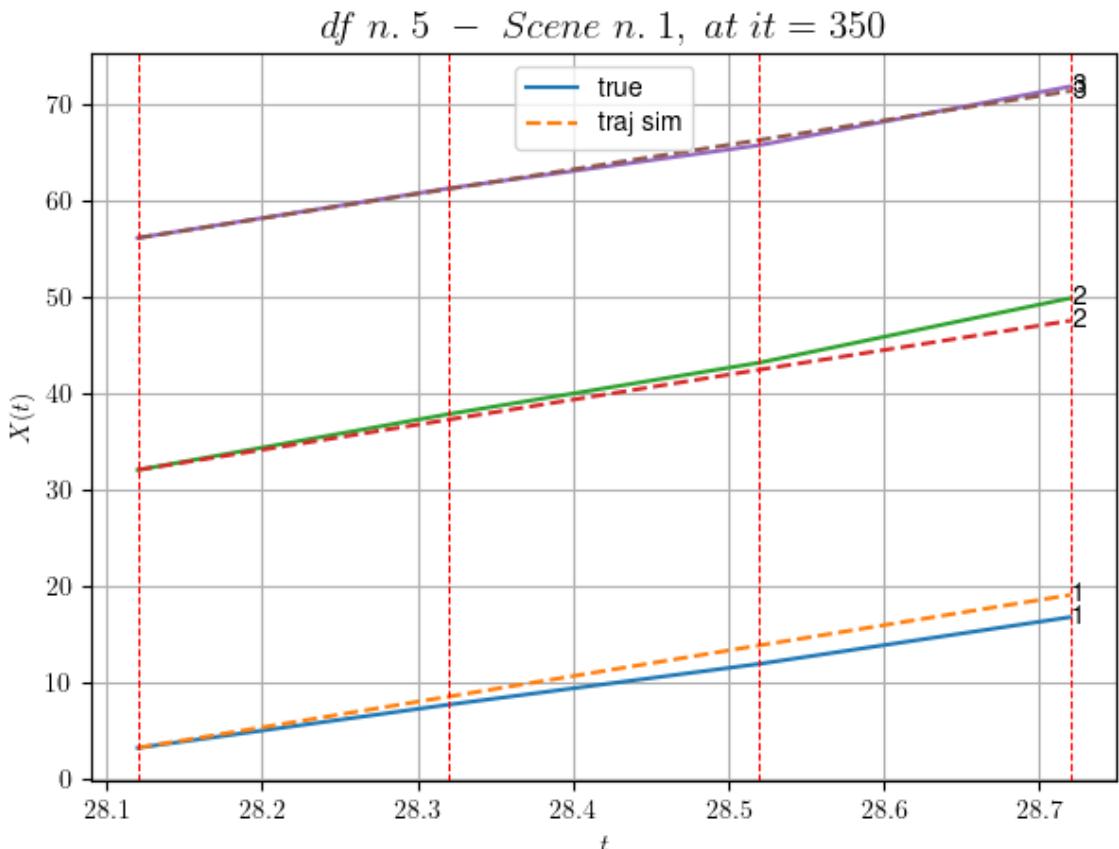
```

* y_true: [21.14004613 26.65085251]
* v_ann: [26.556703567504883, 25.891538619995117, 2
5.379417180280765]

-----
- Time interval n.2: [28.52, 28.72]
* y_true: [24.23010561 33.45140848]
* v_ann: [26.121997833251953, 25.388044357299805, 2
5.379417180280765]

-----
* err= 1.376288915046049
* Learning rate NN = 5.904899080633186e-05
* diff = 0.0012272380853758003

```



#### For scene 1/14

```

* use LR_NN=0.0001 with err=4.84341037898185 at it=19
* v0_scn_mean = 25.775433636575954
* MAE = 1.376288915046049

```

---



---

#### For scene 2/14

```

* use LR_NN=0.001 with err=28.946807036658317 at it=19
* v0_scn_mean = 32.82381350018765
* MAE = 6.231759360038391

```

---



---

```
- Time interval n.0: [151.12, 151.32]
  * y_true: [20.88055844 29.97204611]
  * v_ann: [27.78091812133789, 26.95611572265625, 31.
516127782594133]
```

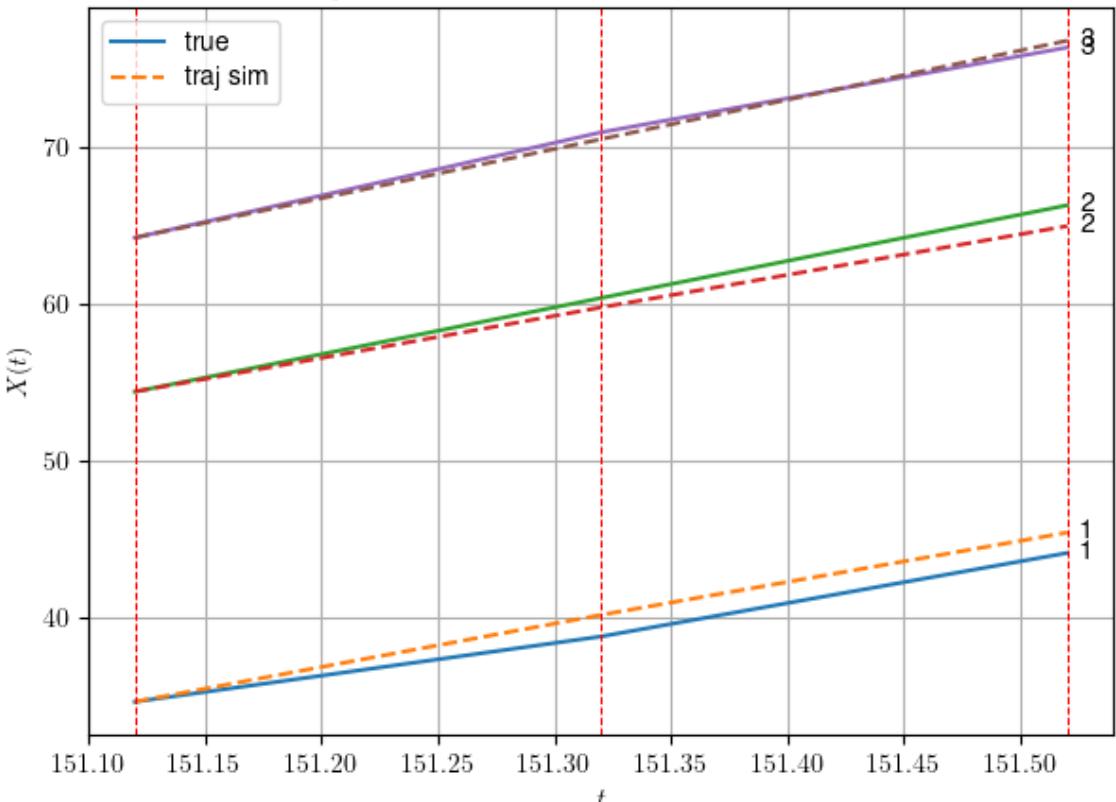
---

```
- Time interval n.1: [151.32, 151.52]
  * y_true: [26.72089495 29.6522691 ]
  * v_ann: [26.347238540649414, 26.017608642578125, 3
1.516127782594133]
```

---

```
* err= 0.6804538204181244
* Learning rate NN = 0.00036449998151510954
* diff = 0.00015788489338064426
```

*df n. 5 – Scene n. 3, at it = 350*



For scene 3/14

```
* use LR_NN=0.0005 with err=5.712129294558785 at it=19
* v0_scn_mean = 31.386184964733143
* MAE = 0.6804538204181244
```

---

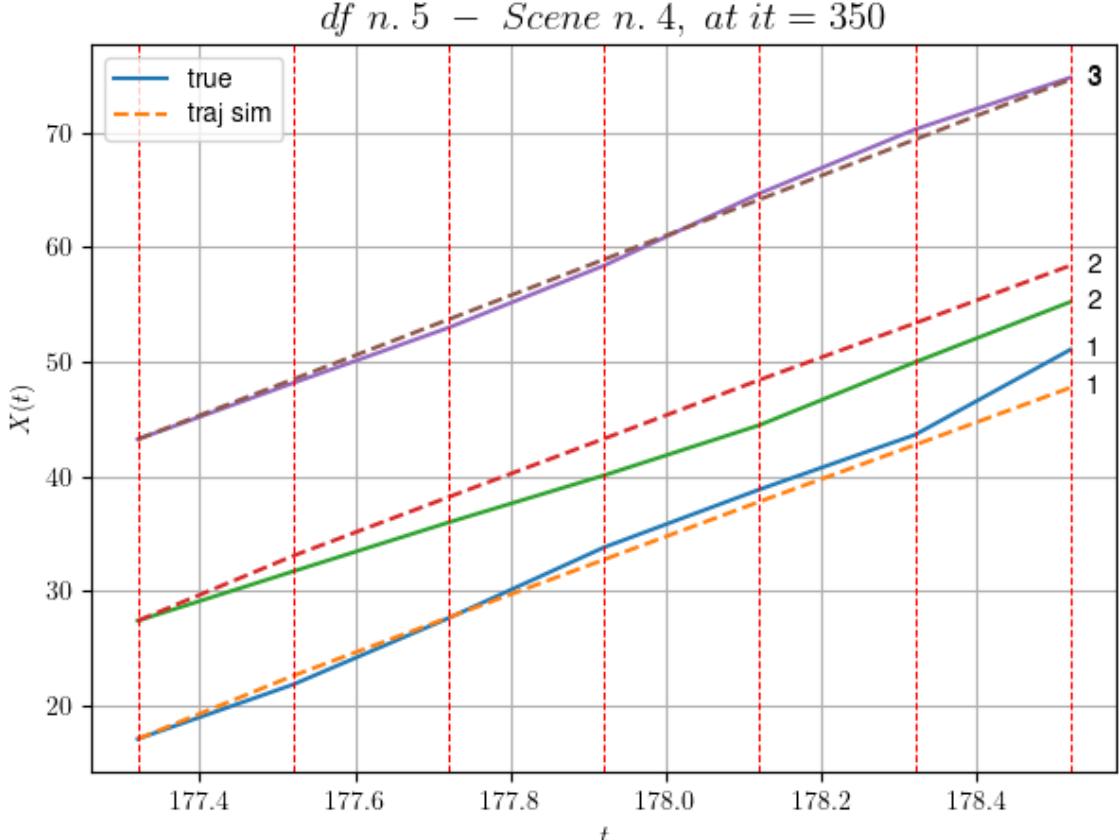


---

```
- Time interval n.0: [177.32, 177.52]
  * y_true: [23.78017477 21.57540501]
  * v_ann: [27.596004486083984, 28.34312629699707, 2
6.180405984731102]
```

---

```
-----  
    - Time interval n.1: [177.52, 177.72]  
      * y_true: [28.99044664 21.37044807]  
      * v_ann: [25.45362663269043, 25.667606353759766, 2  
6.180405984731102]  
  
-----  
    - Time interval n.2: [177.72, 177.92]  
      * y_true: [30.9005134 20.55062028]  
      * v_ann: [25.27083969116211, 25.49071502685547, 26.  
180405984731102]  
  
-----  
    - Time interval n.3: [177.92, 178.12]  
      * y_true: [25.28069635 21.93575232]  
      * v_ann: [25.316909790039062, 25.685523986816406, 2  
6.180405984731102]  
  
-----  
    - Time interval n.4: [178.12, 178.32]  
      * y_true: [23.87574209 27.4762805 ]  
      * v_ann: [24.751667022705078, 24.727155685424805, 2  
6.180405984731102]  
  
-----  
    - Time interval n.5: [178.32, 178.52]  
      * y_true: [37.1766426 26.34131635]  
      * v_ann: [25.027362823486328, 25.22499656677246, 2  
6.180405984731102]  
  
-----  
    * err= 3.3767199700997144  
    * Learning rate NN = 0.00031381050939671695  
    * diff = 0.0015109542068554305
```



For scene 4/14

- \* use LR\_NN=0.001 with err=39.54488776486084 at it=19
- \* v0\_scn\_mean = 26.507772065035294
- \* MAE = 3.373454806970363

---



---

- Time interval n.0: [266.92, 267.12]
- \* y\_true: [18.75024149 31.34179995]
- \* v\_ann: [31.245569229125977, 29.732542037963867, 29.08570823249262]

---



---

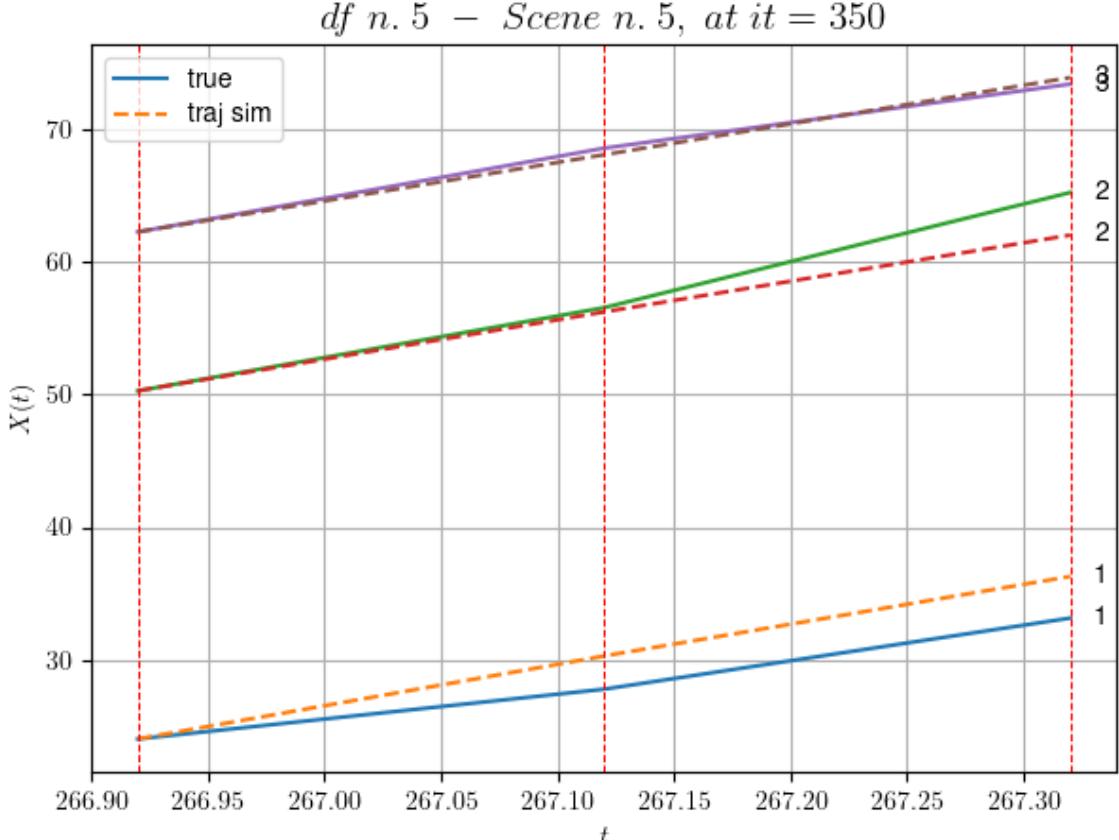
- Time interval n.1: [267.12, 267.32]
- \* y\_true: [26.80047756 43.40316595]
- \* v\_ann: [30.00052833557129, 28.95469093322754, 29.08570823249262]

---



---

- \* err= 3.0003894025596263
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.0016828562856456841



For scene 5/14

- \* use LR\_NN=0.0001 with err=13.086830445778922 at it=19
- \* v0\_scn\_mean = 29.164069469573743
- \* MAE = 3.0003894025596263

---



---

- Time interval n.0: [316.92, 317.12]
- \* y\_true: [22.23560763 28.12633872]
- \* v\_ann: [25.255624771118164, 25.15438461303711, 2  
2.342101196302174]

---



---

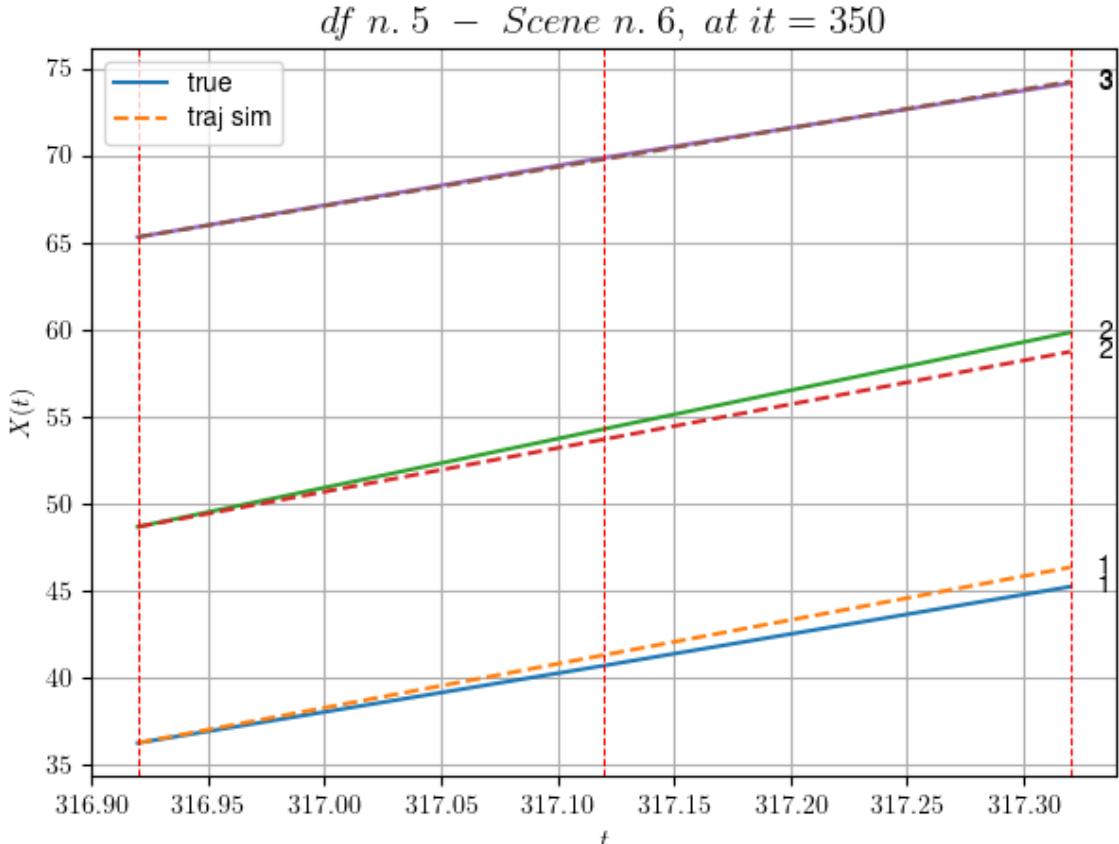
- Time interval n.1: [317.12, 317.32]
- \* y\_true: [22.67586827 27.74684297]
- \* v\_ann: [25.21703338623047, 25.168655395507812, 2  
2.342101196302174]

---



---

- \* err= 0.35611414918268003
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00032200460467807224



For scene 6/14

- \* use LR\_NN=0.0005 with err=1.344792167071563 at it=19
- \* v0\_scn\_mean = 22.998437001812267
- \* MAE = 0.35611414918268003

---



---

For scene 7/14

- \* use LR\_NN=0.0005 with err=8.872038973972758 at it=19
- \* v0\_scn\_mean = 27.555695130783505
- \* MAE = 0.031693147623850934

---



---

For scene 8/14

- \* use LR\_NN=0.0001 with err=1.8534704362548384 at it=19
- \* v0\_scn\_mean = 34.5676129260245
- \* MAE = 0.006066595481499316

---



---

- Time interval n.0: [338.52, 338.72]
    - \* y\_true: [22.83038671 20.44060351]
    - \* v\_ann: [24.00790786743164, 24.039936065673828, 27.85394393324863]
-

```

-----  

    - Time interval n.1: [338.72, 338.92]  

      * y_true: [25.85061095 23.65082523]  

      * v_ann: [23.213930130004883, 23.249853134155273, 2  

      7.85394393324863]  

-----  

    - Time interval n.2: [338.92, 339.12]  

      * y_true: [28.6708889 22.23087004]  

      * v_ann: [23.69245147705078, 23.816007614135742, 2  

      7.85394393324863]  

-----  

    - Time interval n.3: [339.12, 339.32]  

      * y_true: [26.0610325 19.88098798]  

      * v_ann: [24.174301147460938, 24.501354217529297, 2  

      7.85394393324863]  

-----  

    - Time interval n.4: [339.32, 339.52]  

      * y_true: [27.9415295 20.92126982]  

      * v_ann: [23.70217514038086, 24.0242862701416, 27.8  

      5394393324863]  

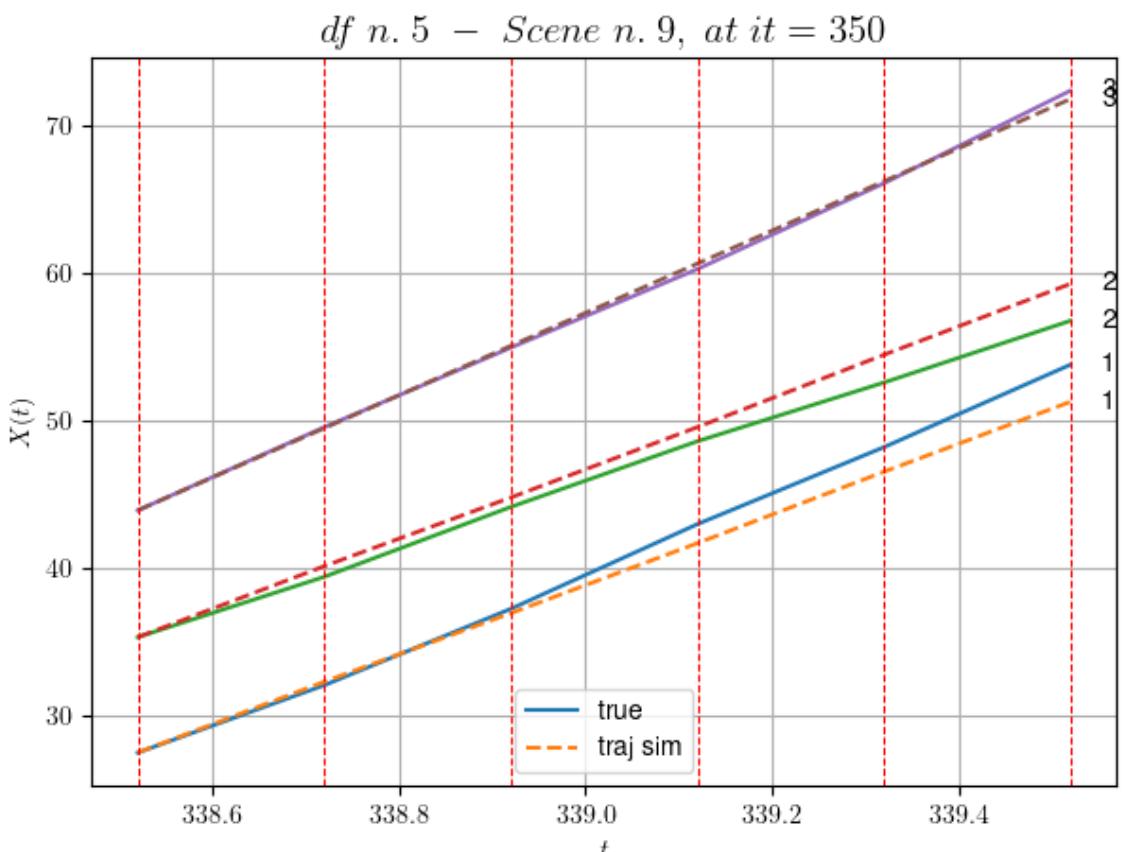
-----  

      * err= 1.278923578365357  

      * Learning rate NN = 0.0003874204121530056  

      * diff = 0.00036208393313064136

```



For scene 9/14

```
* use LR_NN=0.001 with err=11.45933874800915 at it=19
* v0_scn_mean = 28.03787603699505
* MAE = 1.2637001438313282
```

```
=====
=====

- Time interval n.0: [435.72, 435.92]
  * y_true: [16.6003121 32.10080247]
  * v_ann: [19.93157196044922, 17.737768173217773, 2
3.002320042478168]

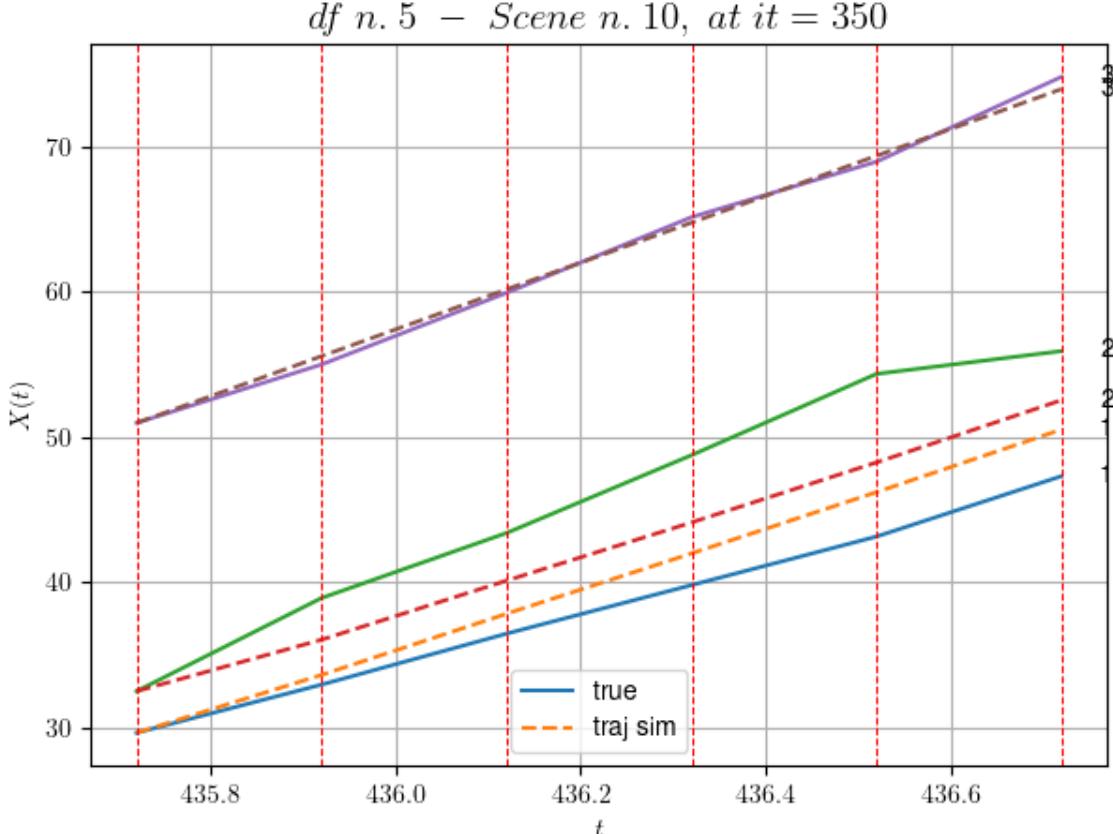
-----
-----
- Time interval n.1: [435.92, 436.12]
  * y_true: [17.55040576 22.4007406 ]
  * v_ann: [21.070938110351562, 20.351295471191406, 2
3.002320042478168]

-----
-----
- Time interval n.2: [436.12, 436.32]
  * y_true: [16.72550921 26.8011085 ]
  * v_ann: [20.788841247558594, 20.038509368896484, 2
3.002320042478168]

-----
-----
- Time interval n.3: [436.32, 436.52]
  * y_true: [16.72550921 28.00144696]
  * v_ann: [21.108564376831055, 20.677932739257812, 2
3.002320042478168]

-----
-----
- Time interval n.4: [436.52, 436.72]
  * y_true: [20.80081615 7.85046318]
  * v_ann: [21.566036224365234, 21.448396682739258, 2
3.002320042478168]

-----
-----
* err= 6.517227386314161
* Learning rate NN = 0.0003874204121530056
* diff = 0.00012030791271655517
```



For scene 10/14

```
* use LR_NN=0.001 with err=12.708785462390667 at it=19
* v0_scn_mean = 23.602070447825238
* MAE = 6.485975380816606
```

---



---

For scene 11/14

```
* use LR_NN=5e-05 with err=2.519702720549943 at it=19
* v0_scn_mean = 23.023173097783857
* MAE = 0.1617180833463764
```

---



---

For scene 12/14

```
* use LR_NN=5e-05 with err=3.6272943384738316 at it=19
* v0_scn_mean = 21.768162114368614
* MAE = 0.09587209625620652
```

---



---

- Time interval n.0: [178.12, 178.32]
  - \* y\_true: [23.59034379 23.87574209 27.4762805 ]
  - \* v\_ann: [27.049732208251953, 26.55219268798828, 27.442546844482422, 26.192903384607693]

---

```

-----  

- Time interval n.1: [178.32, 178.52]  

* y_true: [17.35034213 37.1766426 26.34131635]  

* v_ann: [24.800289154052734, 25.064964294433594, 2  

4.571441650390625, 26.192903384607693]
-----
```

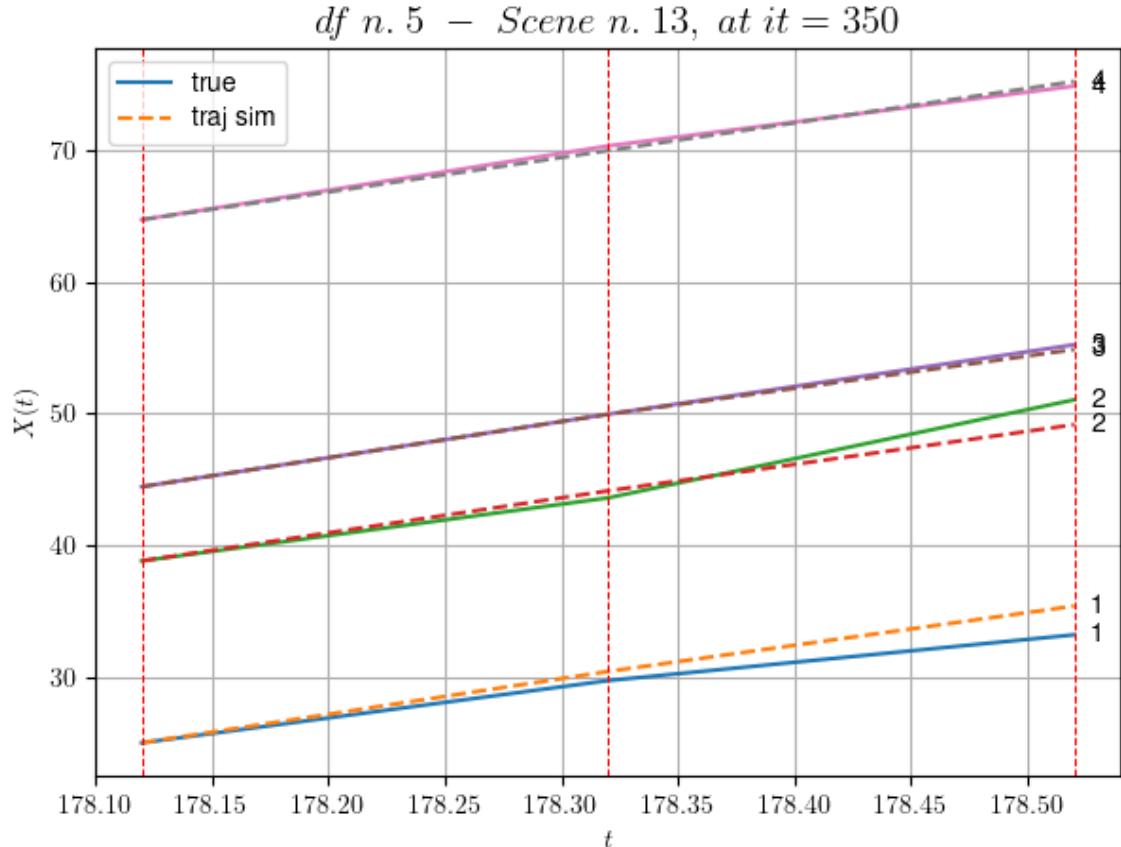
```

-----  

* err= 0.7889660733497422  

* Learning rate NN = 0.0007289999630302191  

* diff = 5.546075760531899e-06
-----
```



For scene 13/14

```

* use LR_NN=0.001 with err=6.633990384732595 at it=19  

* v0_scn_mean = 26.62744803102857  

* MAE = 0.7889660733497422
=====
```

For df=5 with 14 scenes, time taken: 123.58

```

=====
```

In df n.6/10 we have 3 scenes

```

*****
```

```

-----  

- Time interval n.0: [552.20, 552.40]  

* y_true: [14.01030513 13.18063102]  

* v_ann: [17.98832130432129, 18.264387130737305, 2  

0.23327561277354]
```

```

-----  

-----  

    - Time interval n.1: [552.40, 552.60]  

      * y_true: [18.39048446 22.9012939 ]  

      * v_ann: [17.713165283203125, 17.92610740661621, 2  

0.23327561277354]

```

```

-----  

-----  

    - Time interval n.2: [552.60, 552.80]  

      * y_true: [16.95052919 22.22132939]  

      * v_ann: [17.83985710144043, 18.12130355834961, 20.  

23327561277354]

```

```

-----  

-----  

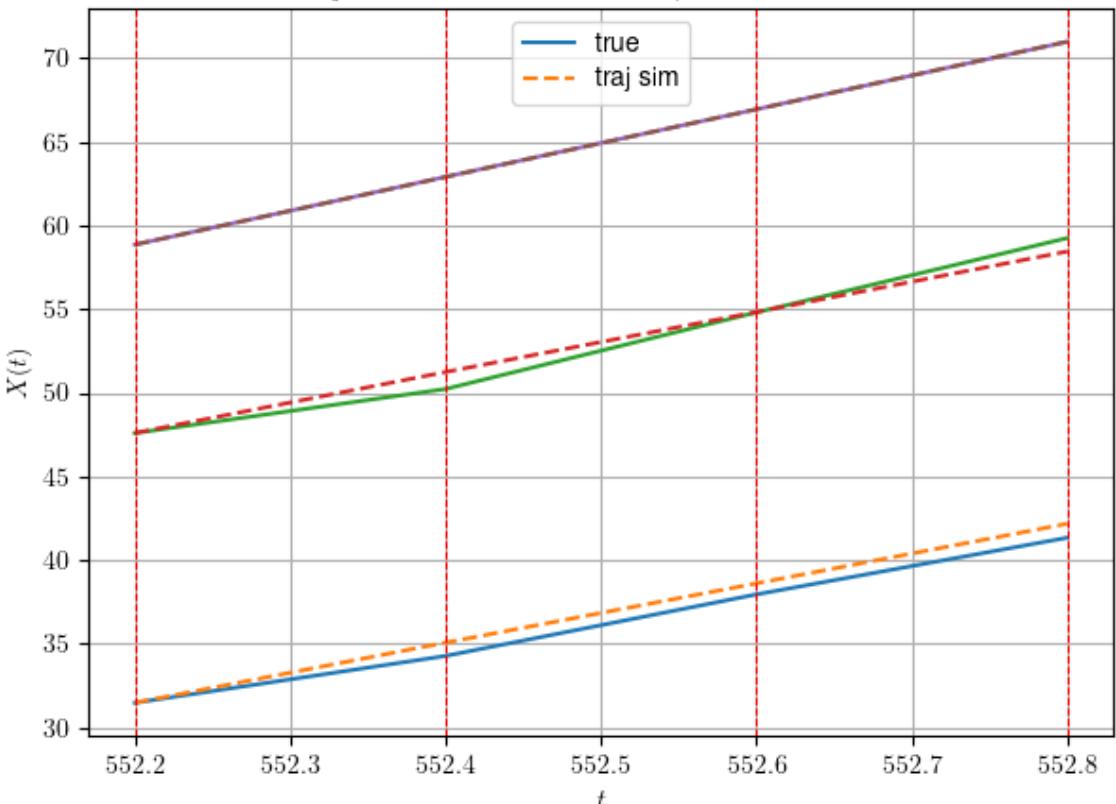
* err= 0.2868933646727282  

* Learning rate NN = 5.904899080633186e-05  

* diff = 0.0010447775438242046

```

*df n. 6 – Scene n. 0, at it = 350*



For scene 0/3

```

* use LR_NN=0.0001 with err=5.827966396328455 at it=19
* v0_scn_mean = 21.070352607678135
* MAE = 0.2527649446254046

```

```

=====  

=====  

    - Time interval n.0: [553.00, 553.20]  

      * y_true: [23.0804555 19.17546127 18.9008181 ]  

      * v_ann: [19.446287155151367, 19.416067123413086, 1  

9.380870819091797, 23.749701248855562]

```

```

- Time interval n.1: [553.20, 553.40]
  * y_true: [22.02058024 17.45053567 16.85079909]
  * v_ann: [19.69818115234375, 19.737741470336914, 1
  9.782115936279297, 23.749701248855562]

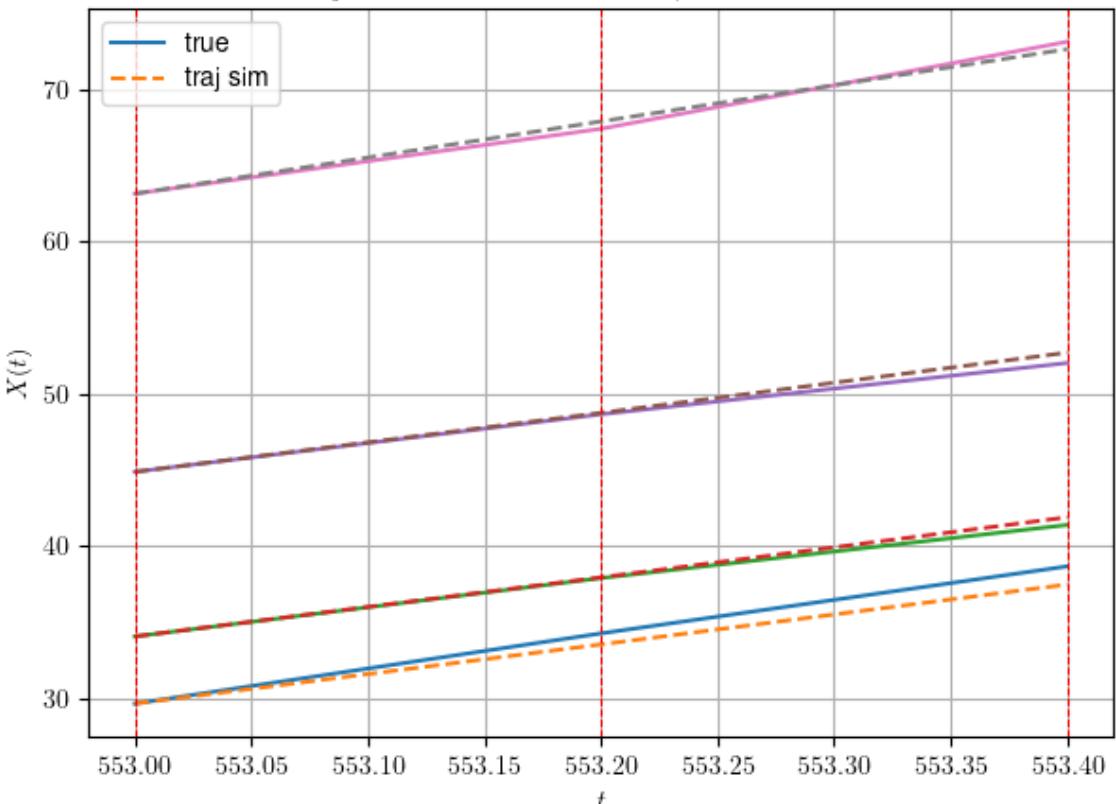
```

```

* err= 0.262600446451226
* Learning rate NN = 0.00036449998151510954
* diff = 5.330424874605555e-06

```

*df n. 6 – Scene n. 1, at it = 350*



For scene 1/3

```

* use LR_NN=0.0005 with err=6.111820509635211 at it=19
* v0 scn_mean = 24.463114680460983
* MAE = 0.2589689744827662

```

```

=====
=====
- Time interval n.0: [554.00, 554.20]
  * y_true: [20.50061186 21.35116733 22.20133365]
  * v_ann: [1.1556515293331682e-11, 22.4829711914062
  5, 4.8333491577068344e-05, 23.647953726266184]

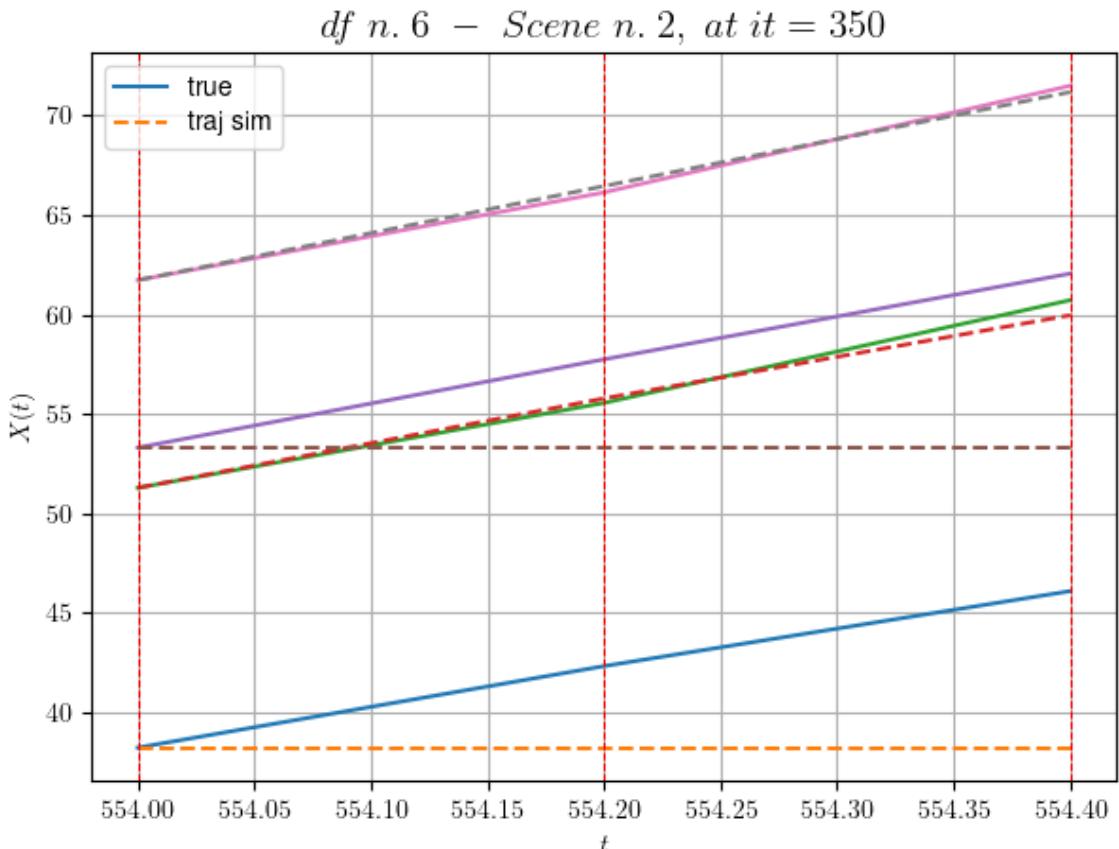
```

```

=====
=====
- Time interval n.1: [554.20, 554.40]
  * y_true: [18.86075328 25.85180384 21.5614577 ]
  * v_ann: [5.523895577064231e-12, 20.91829872131347
  7, 4.710621578851715e-05, 23.647953726266184]

```

```
* err= 14.661504817300207  
* Learning rate NN = 0.0036449995823204517  
* diff = 3.808356461831863e-05
```



For scene 2/3

\* use LR\_NN=0.005 with err=6.905315182065959 at it=19  
\* v0\_scn\_mean = 24.372980690622427  
\* MAE = 0.9444093903040114

For df=6 with 3 scenes time taken: 23.10

In df n.7/10 we have 8 scenes

\*\*\*\*\*

## Table of Contents

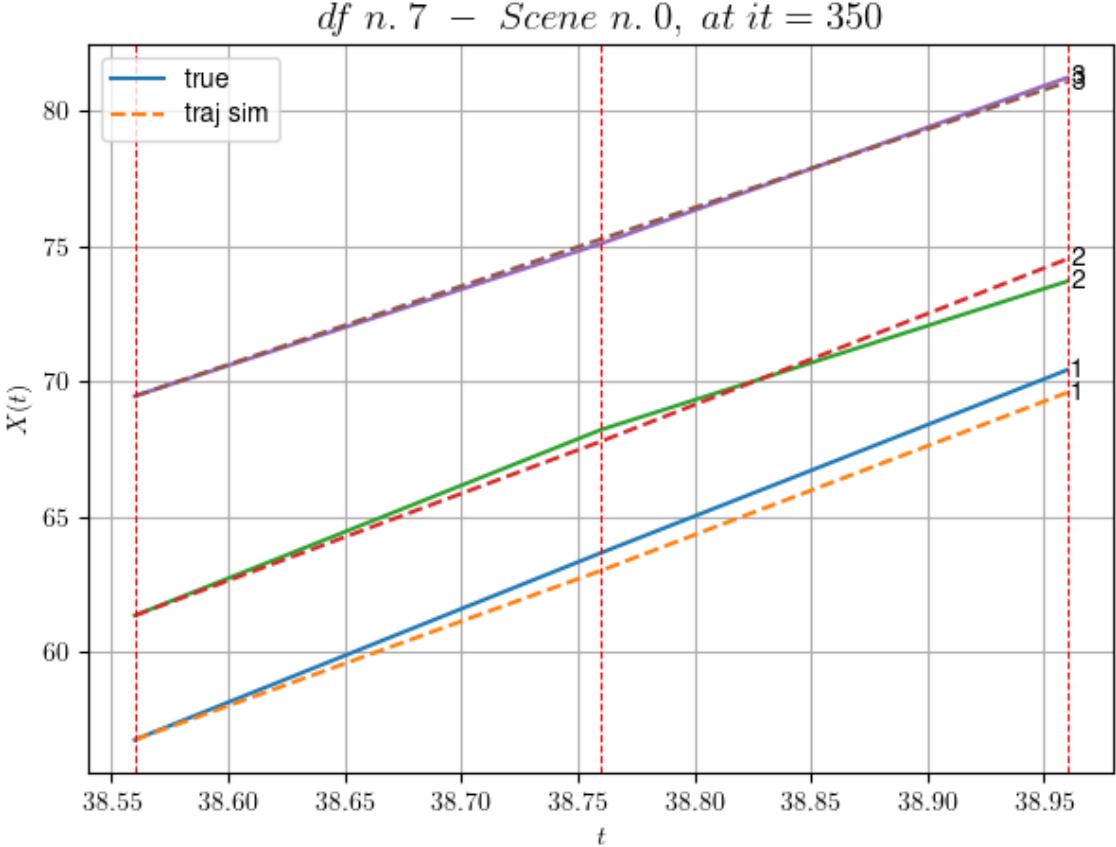
```
- time interval n.0: [38.56, 38.76]
  * y_true: [34.50899027 34.29923068]
  * v_ann: [31.241336822509766, 32.1526985168457, 28.
99001788809879]
```

- Time interval n.1: [38.76, 38.96]  
  \* y true: [33.76780394 27.40980382]

```
* v_ann: [32.858699798583984, 33.66453170776367, 2
8.99001788809879]
```

---

```
* err= 0.22656591916392213
* Learning rate NN = 0.0007289999630302191
* diff = 5.377195754333042e-05
```



For scene 0/8

```
* use LR_NN=0.001 with err=3.496773452554415 at it=19
* v0_scn_mean = 29.076580460934764
* MAE = 0.14432000389883462
```

---



---

```
- Time interval n.0: [39.76, 39.96]
  * y_true: [22.5368218 26.50901133]
  * v_ann: [27.38041114807129, 7.928321961107046e-19,
28.629762622553923]
```

---



---

```
- Time interval n.1: [39.96, 40.16]
  * y_true: [27.13488394 22.34107329]
  * v_ann: [24.963153839111328, 1.0412504055883822e-1
8, 28.629762622553923]
```

---



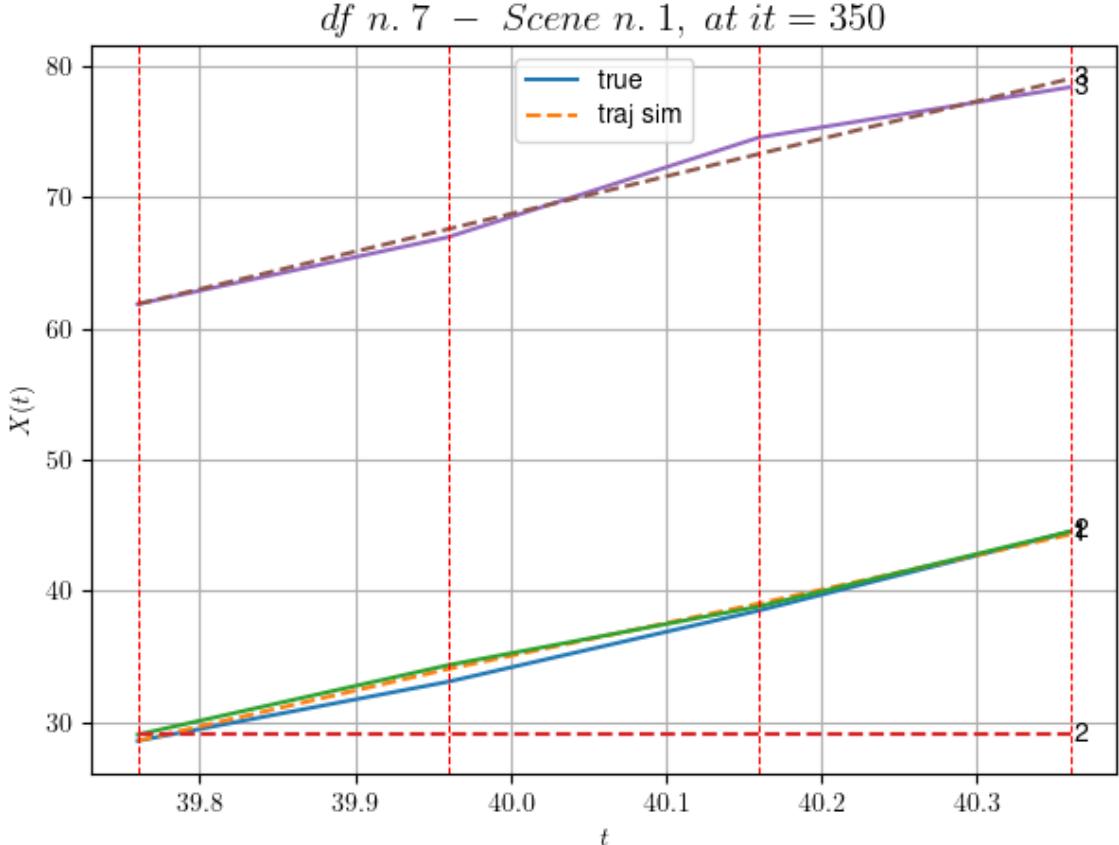
---

```
- Time interval n.2: [40.16, 40.36]
  * y_true: [29.97962766 28.56631616]
```

\* v\_ann: [26.262500762939453, 3.6014555297635184e-2  
1, 28.629762622553923]

---

\* err= 30.57777034050385  
\* Learning rate NN = 0.0005904899444431067  
\* diff = 0.00023399107828581123



For scene 1/8

\* use LR\_NN=0.001 with err=26.13285521391444 at it=19  
\* v0\_scn\_mean = 28.747201606264717  
\* MAE = 4.479765584612904

---



---

For scene 2/8

\* use LR\_NN=5e-05 with err=3.054350209800211 at it=19  
\* v0\_scn\_mean = 22.570795193223542  
\* MAE = 36.66835326665806

---



---

For scene 3/8

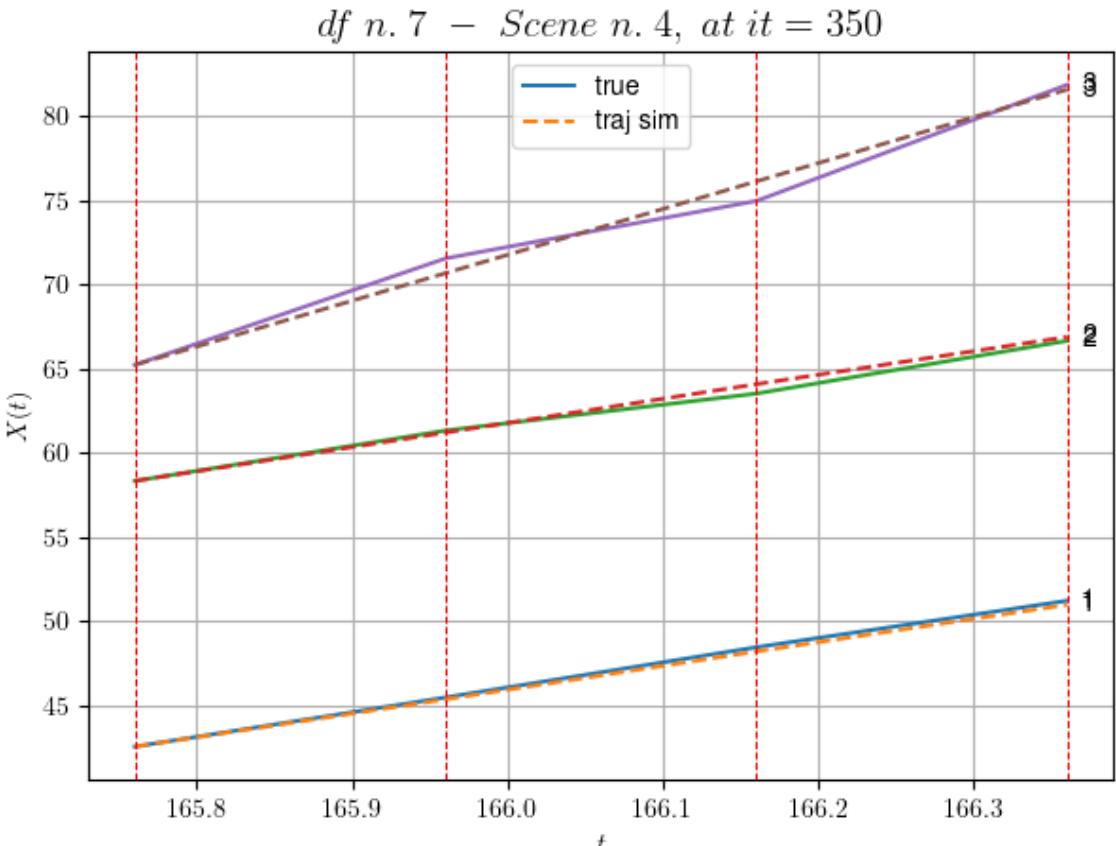
\* use LR\_NN=0.0001 with err=1.9471512765043721 at it=19  
\* v0\_scn\_mean = 33.17444584784243  
\* MAE = 14.206049784928117

```
=====
- Time interval n.0: [165.76, 165.96]
  * y_true: [14.62535373 14.97522028]
  * v_ann: [14.068140029907227, 14.365582466125488, 2
7.26222960772804]
```

```
=====
- Time interval n.1: [165.96, 166.16]
  * y_true: [14.90483904 10.97892299]
  * v_ann: [14.21042251586914, 14.382268905639648, 2
7.26222960772804]
```

```
=====
- Time interval n.2: [166.16, 166.36]
  * y_true: [13.82116599 15.66867879]
  * v_ann: [13.90038013458252, 14.036406517028809, 2
7.26222960772804]
```

```
=====
* err= 0.226224679315972
* Learning rate NN = 0.0002952449722215533
* 1:55 2: 0.0002952449722215533
```



For scene 4/8

```
* use LR_NN=0.0005 with err=1.408080723261439 at it=19
* v0_scn_mean = 27.49687579224644
* MAE = 0.226224679315972
```

```

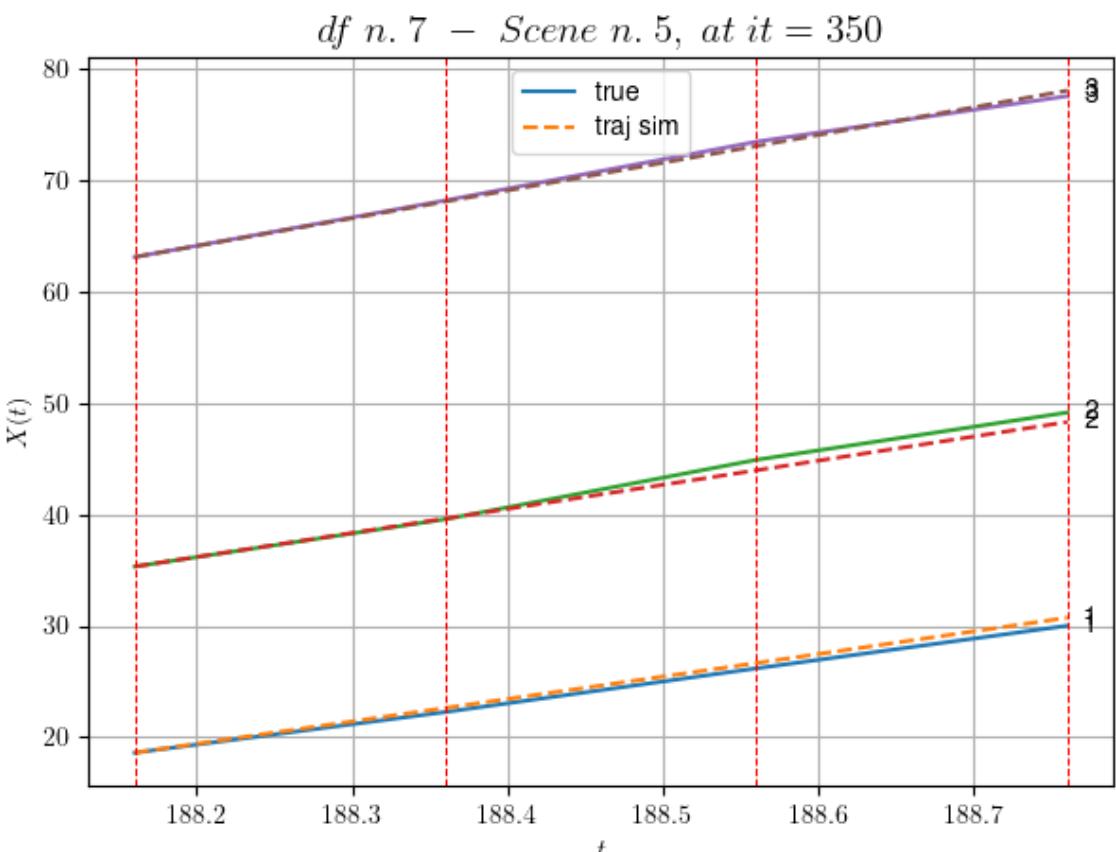
=====
- Time interval n.0: [188.16, 188.36]
  * y_true: [18.26365072 21.2472937 ]
  * v_ann: [20.070146560668945, 21.54986572265625, 2
4.89864510474215]

-----
- Time interval n.1: [188.36, 188.56]
  * y_true: [19.58083161 26.63811802]
  * v_ann: [20.138891220092773, 21.64636993408203, 2
4.89864510474215]

-----
- Time interval n.2: [188.56, 188.76]
  * y_true: [19.1135942 21.22632097]
  * v_ann: [20.348405838012695, 21.665815353393555, 2
4.89864510474215]

-----
* err= 0.24090343352285762
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.000510503600707010

```



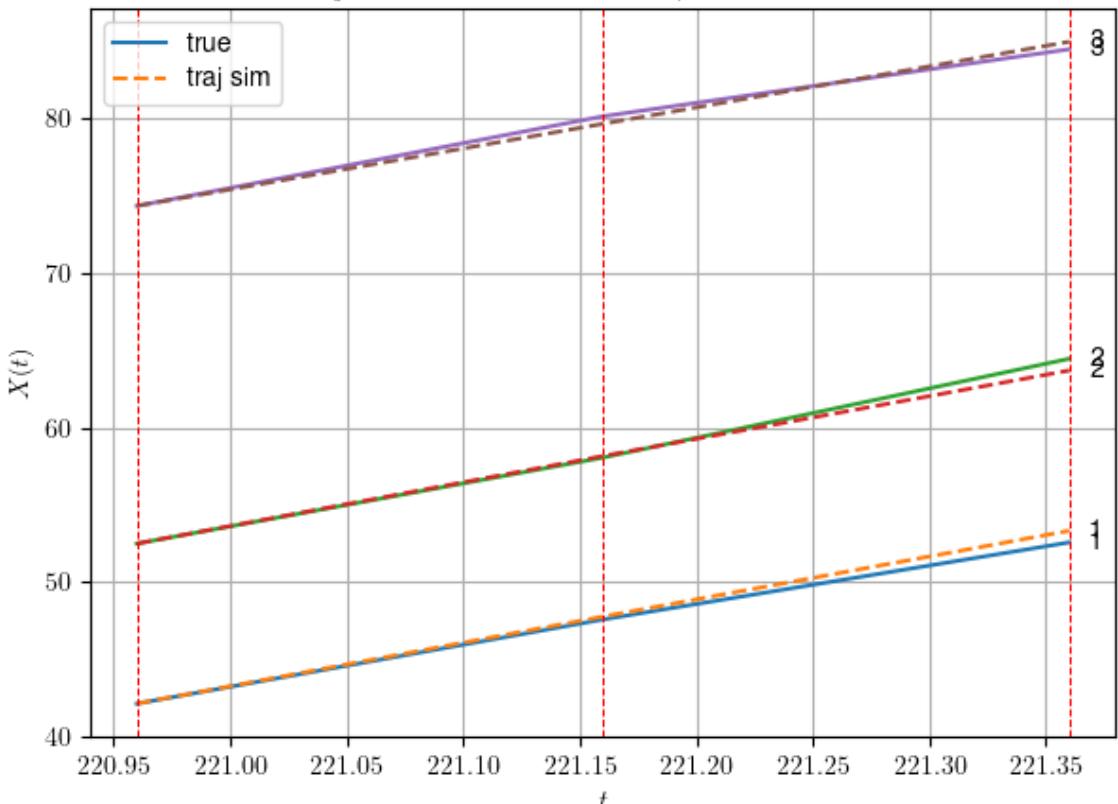
For scene 5/8  
\* use LR\_NN=1e-05 with err=2.2842028477461143 at it=19  
\* v0\_scn\_mean = 25.335867110438556  
\* MAE = 0.22737931252607768

```
=====
- Time interval n.0: [220.96, 221.16]
  * y_true: [27.25777683 27.84910592]
  * v_ann: [28.194000244140625, 28.371591567993164, 2
  6.579870119515892]
```

```
=====
- Time interval n.1: [221.16, 221.36]
  * y_true: [24.9447965 32.01250046]
  * v_ann: [27.78711700439453, 27.69048500061035, 26.
  579870119515892]
```

```
=====
* err= 0.1855390223011761
* Learning rate NN = 0.00036449998151510954
* diff = 8.171673651336653e-06
```

*df n. 7 – Scene n. 6, at it = 350*



For scene 6/8

```
* use LR_NN=0.0005 with err=3.1149043257284874 at it=19
* v0_scn_mean = 26.872999312992626
* MAE = 0.1740917557000945
```

```
=====
- Time interval n.0: [166.56, 166.76]
  * y_true: [17.24164345 15.73752306 15.58083022]
  * v_ann: [18.038522720336914, 17.930469512939453, 1
  7.977502822875977, 17.37043158542254]
```

```

-----  

-----  

    - Time interval n.1: [166.76, 166.96]  

      * y_true: [18.38470966 27.72552812 9.3330177 ]  

      * v_ann: [16.658679962158203, 17.17434310913086, 1  

6.920698165893555, 17.37043158542254]  

-----  

-----  

    - Time interval n.2: [166.96, 167.16]  

      * y_true: [16.02323775 24.97208403 13.98221987]  

      * v_ann: [17.86948585510254, 17.815996170043945, 1  

7.8464298248291, 17.37043158542254]  

-----  

-----  

    - Time interval n.3: [167.16, 167.36]  

      * y_true: [18.26534189 20.06151439 15.46259314]  

      * v_ann: [18.26911163330078, 17.96320915222168, 18.  

139442443847656, 17.37043158542254]  

-----  

-----  

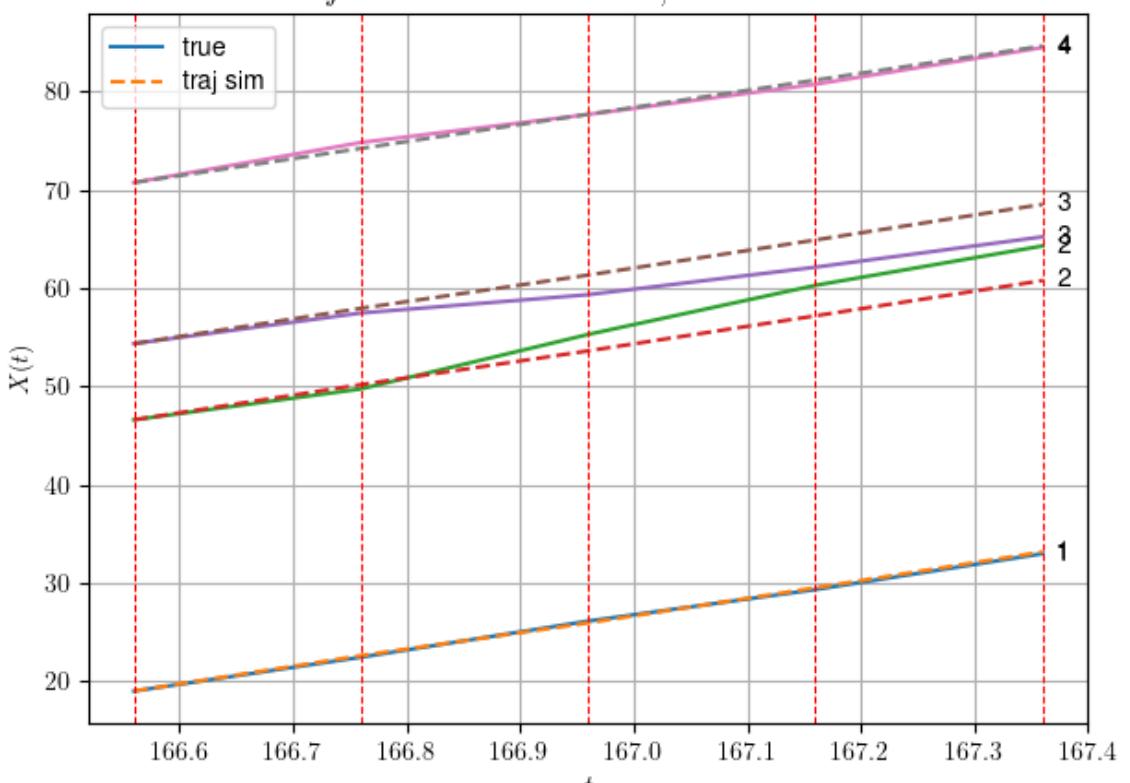
      * err= 2.4264831078111233  

      * Learning rate NN = 0.000478296831715852  

      * diff = 6.642006639356879e-06

```

*df n. 7 – Scene n. 7, at it = 350*



For scene 7/8

```

* use LR_NN=0.001 with err=26.274918623559444 at it=19
* v0_scn_mean = 18.81197927795333
* MAE = 2.4176958687119594

```

```
For df=7 with 8 scenes, time taken: 70.37
=====
=====
=====
*****
*****
In df n.8/10 we have 21 scenes
*****
*****
For scene 0/21
* use LR_NN=0.001 with err=17.723622511757483 at it=19
* v0_scn_mean = 18.532749214531986
* MAE = 1.5726945836824882

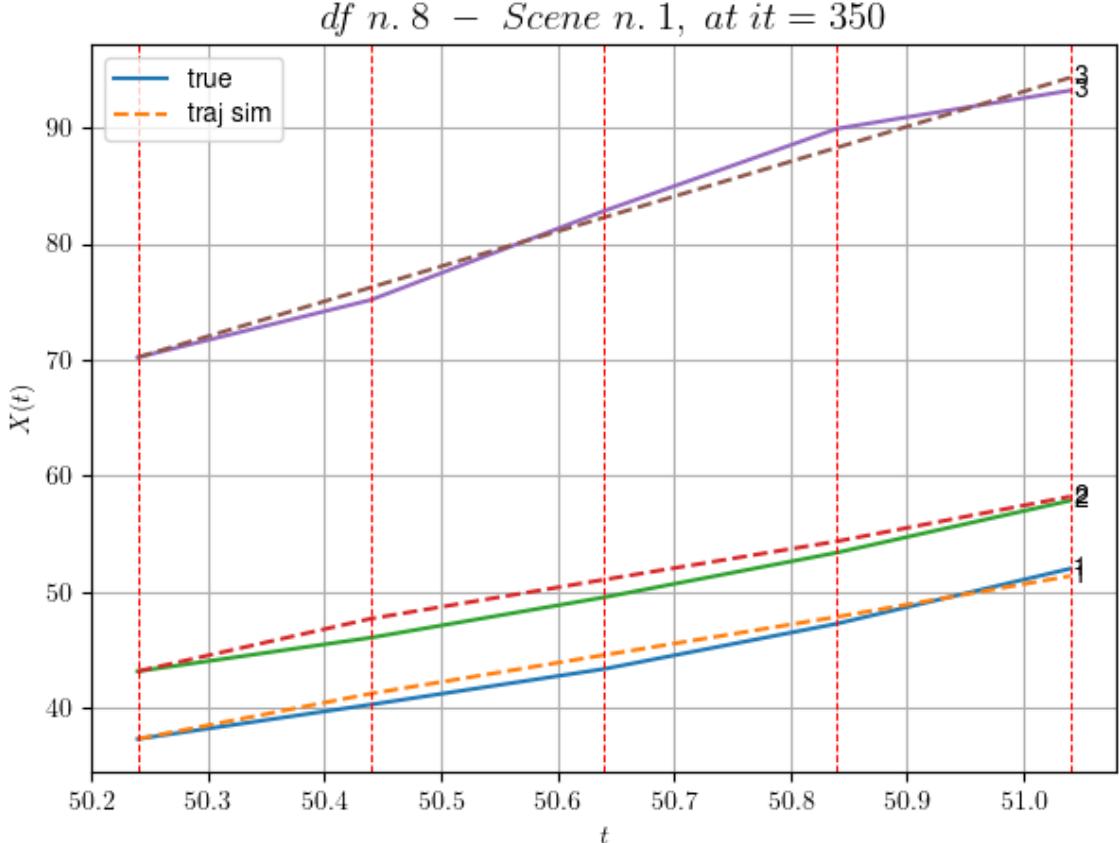
=====
=====
- Time interval n.0: [50.24, 50.44]
  * y_true: [14.83043604 14.50055453]
  * v_ann: [19.553232192993164, 22.68970489501953, 3
0.15765983487899]

-----
- Time interval n.1: [50.44, 50.64]
  * y_true: [15.35052738 17.38080918]
  * v_ann: [16.617929458618164, 16.825956344604492, 3
0.15765983487899]

-----
- Time interval n.2: [50.64, 50.84]
  * y_true: [19.54078826 19.30097894]
  * v_ann: [16.478046417236328, 16.541765213012695, 3
0.15765983487899]

-----
- Time interval n.3: [50.84, 51.04]
  * y_true: [23.72114006 22.40641196]
  * v_ann: [17.632753372192383, 19.294462203979492, 3
0.15765983487899]

-----
* err= 0.9682694850281416
* Learning rate NN = 0.000478296831715852
* diff = 1.1470482942311575e-06
```



For scene 1/21

- \* use LR\_NN=0.001 with err=11.263039167496062 at it=19
- \* v0\_scn\_mean = 30.1441472777959
- \* MAE = 0.8114558269989333

---



---

- Time interval n.0: [102.24, 102.44]
- \* y\_true: [22.78095819 15.94092959]
- \* v\_ann: [20.4591121673584, 20.55213165283203, 31.3482224079019]

---



---

- Time interval n.1: [102.44, 102.64]
- \* y\_true: [23.36120187 12.10080168]
- \* v\_ann: [20.159318923950195, 20.509183883666992, 31.3482224079019]

---



---

- Time interval n.2: [102.64, 102.84]
- \* y\_true: [20.51121756 22.37162153]
- \* v\_ann: [19.565839767456055, 19.862445831298828, 31.3482224079019]

---



---

- Time interval n.3: [102.84, 103.04]
- \* y\_true: [23.62167761 20.76175162]
- \* v\_ann: [19.896501541137695, 20.38058853149414, 31.3482224079019]

---



---

1.34828224079019]

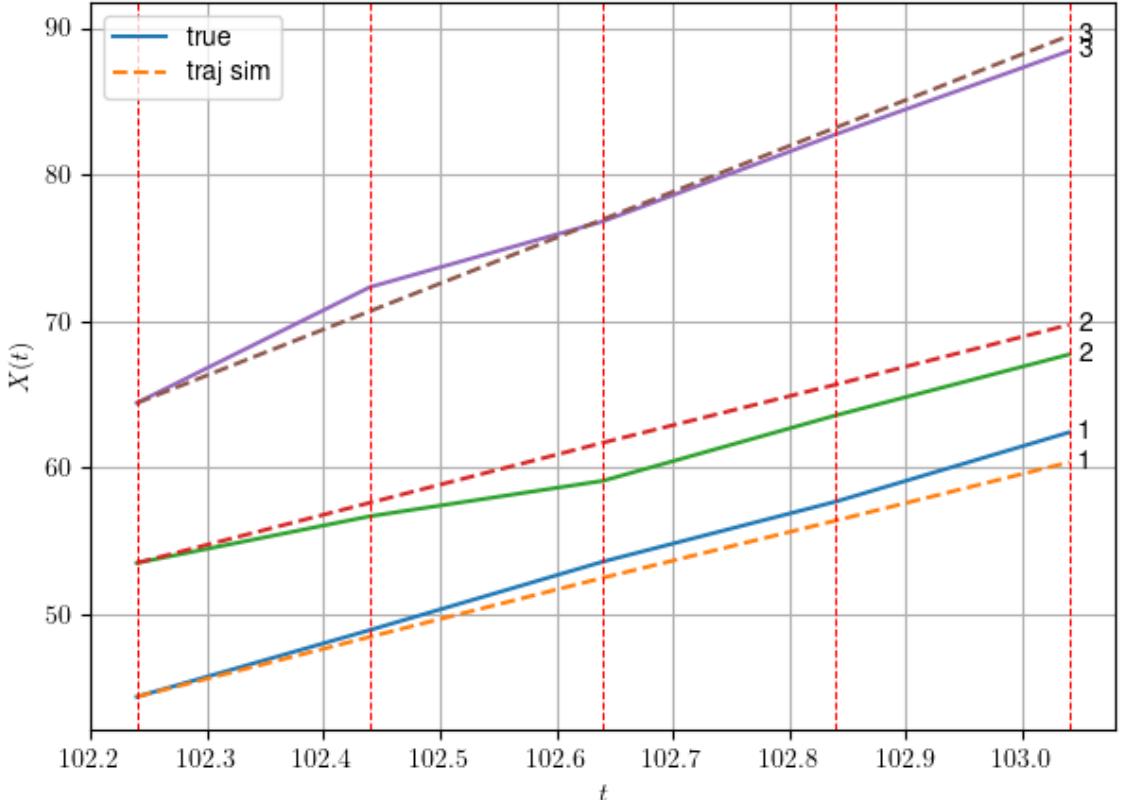
---



---

- \* err= 1.8290437299634101
- \* Learning rate NN = 0.000239148415857926
- \* diff = 0.0003176576818315624

*df n. 8 – Scene n. 2, at it = 350*



For scene 2/21

- \* use LR\_NN=0.0005 with err=12.951549770621776 at it=19
- \* v0\_scn\_mean = 31.232724966758735
- \* MAE = 1.8290437299634101

---



---

- Time interval n.0: [108.84, 109.04]
  - \* y\_true: [17.9810803 26.65193678]
  - \* v\_ann: [20.75617790222168, 20.52260398864746, 20.549083403843284]

---



---

- Time interval n.1: [109.04, 109.24]
  - \* y\_true: [14.30252156 22.9019425 ]
  - \* v\_ann: [21.440046310424805, 21.456668853759766, 20.549083403843284]

---



---

- Time interval n.2: [109.24, 109.44]
  - \* y\_true: [21.24158827 21.25204953]
  - \* v\_ann: [20.12311553955078, 19.943696975708008, 20.549083403843284]

0.549083403843284]

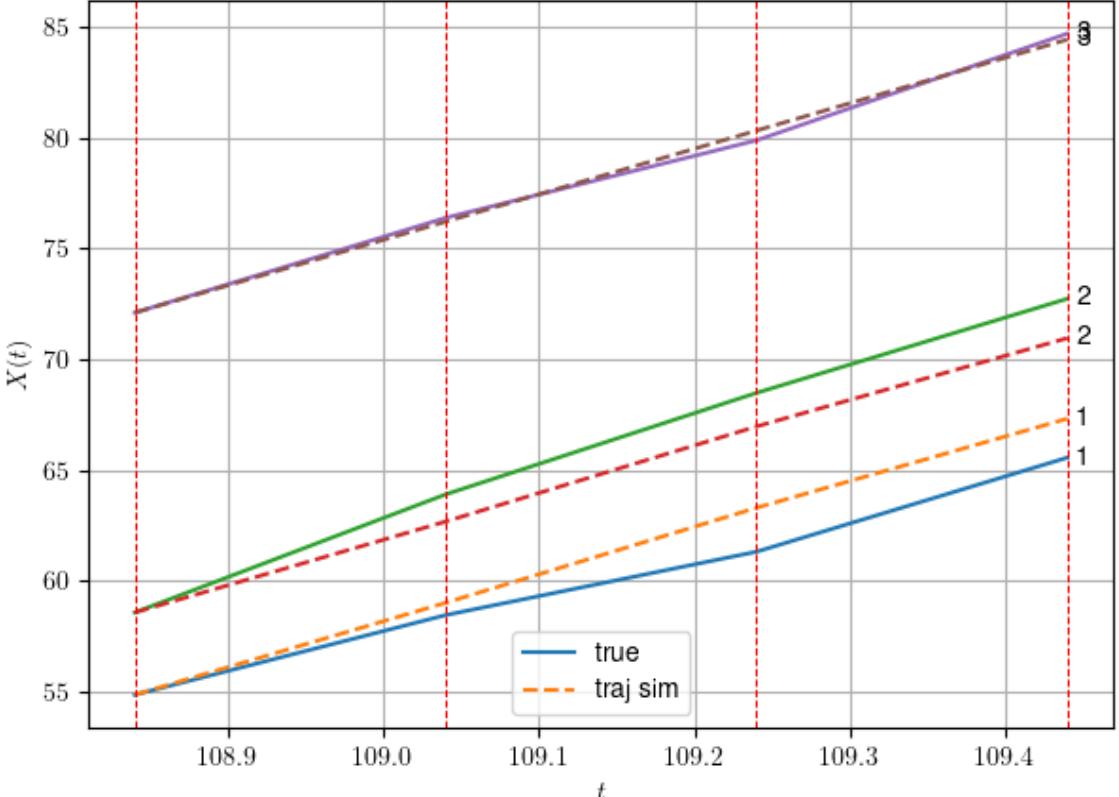
---



---

- \* err= 1.215155775263015
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.00018431035328569934

*df n. 8 – Scene n. 3, at it = 350*



For scene 3/21

- \* use LR\_NN=0.001 with err=5.938983920668502 at it=19
- \* v0\_scn\_mean = 21.359093449151537
- \* MAE = 1.215155775263015

---



---

- Time interval n.0: [130.04, 130.24]
- \* y\_true: [23.9806113 21.72216875]
- \* v\_ann: [23.42658805847168, 23.317914962768555, 4 1.055542418781506]

---



---

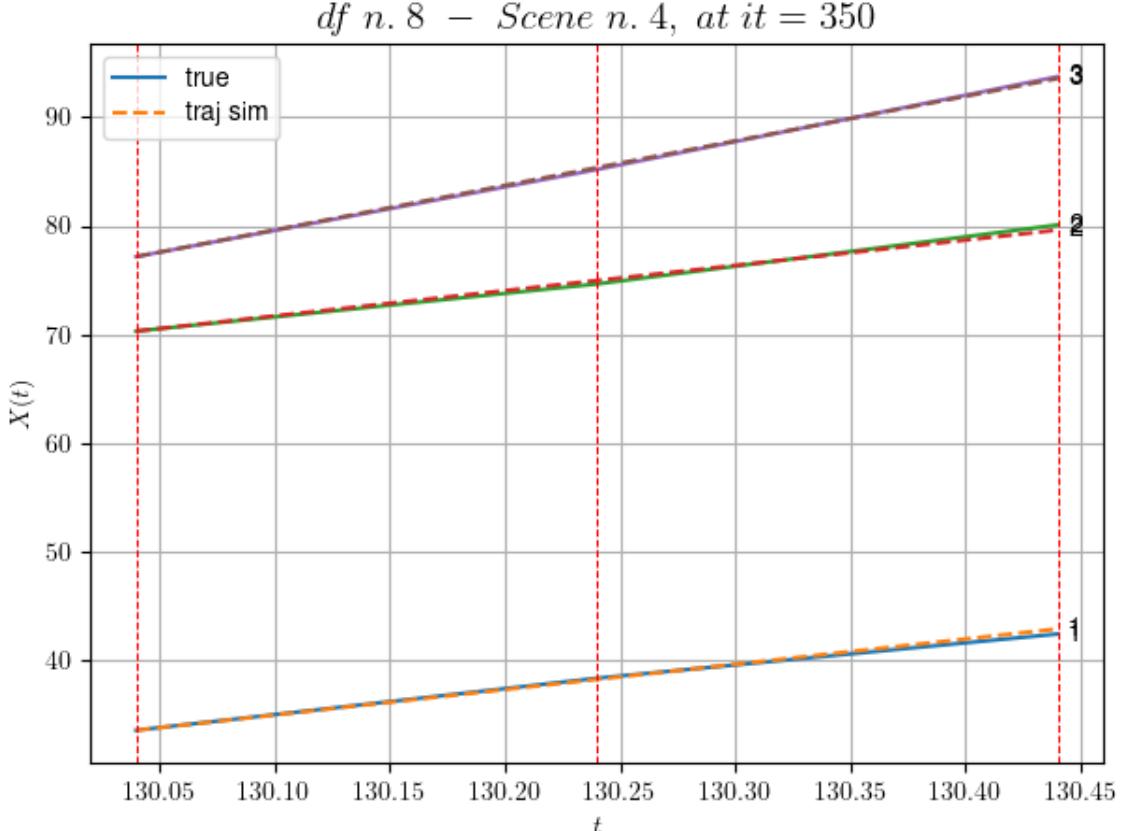
- Time interval n.1: [130.24, 130.44]
- \* y\_true: [20.38064152 27.22317612]
- \* v\_ann: [23.284038543701172, 23.2742919921875, 41. 055542418781506]

---



---

- \* err= 0.0690316699723073
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 2.3888021956769423e-06



For scene 4/21

- \* use LR\_NN=0.0001 with err=9.665651100934035 at it=19
- \* v0\_scn\_mean = 40.10800465094372
- \* MAE = 0.0690316699723073

---



---

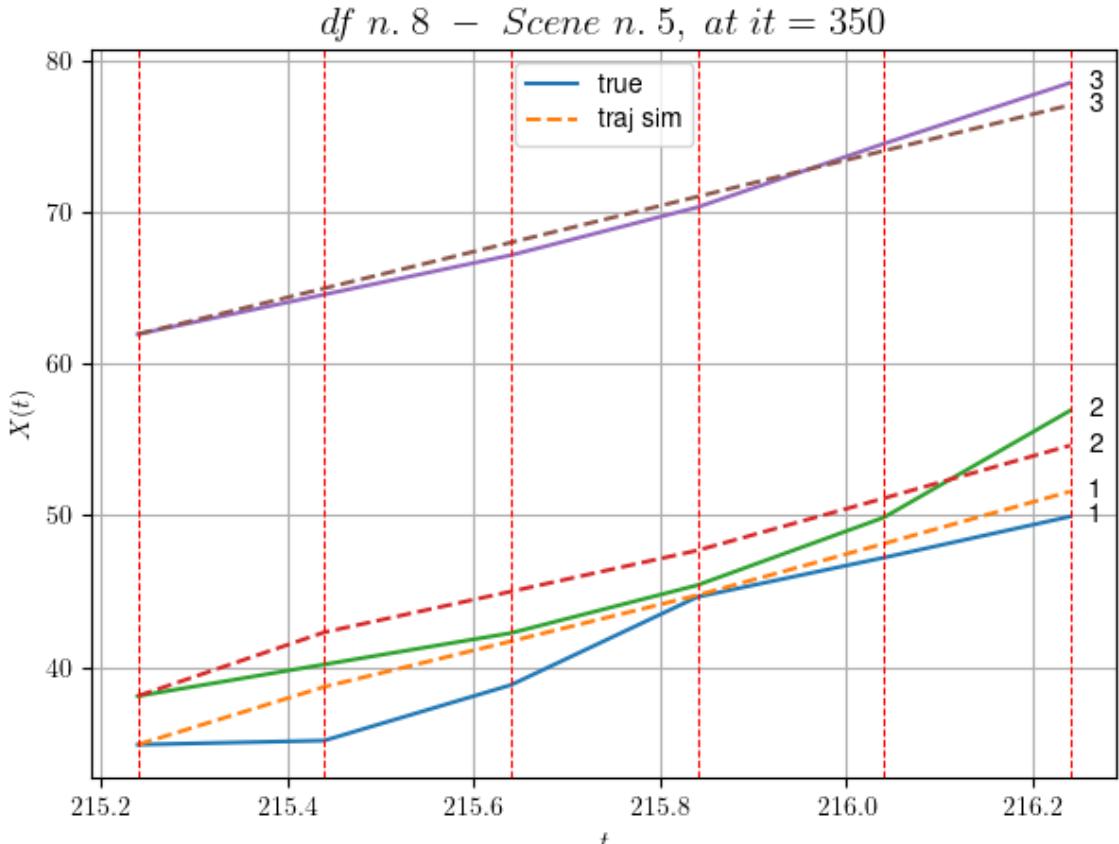
- Time interval n.0: [215.24, 215.44]
  - \* y\_true: [ 1.34614625 10.42531549]
  - \* v\_ann: [19.0433292388916, 21.01545524597168, 15.100797270465677]
  
- Time interval n.1: [215.44, 215.64]
  - \* y\_true: [18.28906766 10.32533879]
  - \* v\_ann: [15.008308410644531, 13.427153587341309, 15.100797270465677]
  
- Time interval n.2: [215.64, 215.84]
  - \* y\_true: [29.02100933 15.78058213]
  - \* v\_ann: [15.167572975158691, 13.538674354553223, 15.100797270465677]
  
- Time interval n.3: [215.84, 216.04]
  - \* y\_true: [12.95052595 22.3009853 ]
  - \* v\_ann: [17.00035285949707, 17.18285369873047, 15.100797270465677]

100797270465677]

```
- Time interval n.4: [216.04, 216.24]
  * y_true: [13.56563519 35.25195514]
  * v_ann: [17.19738006591797, 17.4139347076416, 15.1
```

00797270465677]

```
* err= 2.904504977313828
* Learning rate NN = 0.0003874204121530056
* diff = 0.0002213396676160606
```



For scene 5/21

```
* use LR_NN=0.001 with err=46.43473520584772 at it=19
* v0_scn_mean = 16.377763769452134
* MAE = 2.829795379681394
```

```
- Time interval n.0: [222.64, 222.84]
  * y_true: [3.4148313 7.54419185]
  * v_ann: [6.456457138061523, 4.829220294952393, 12.
```

428665091344943]

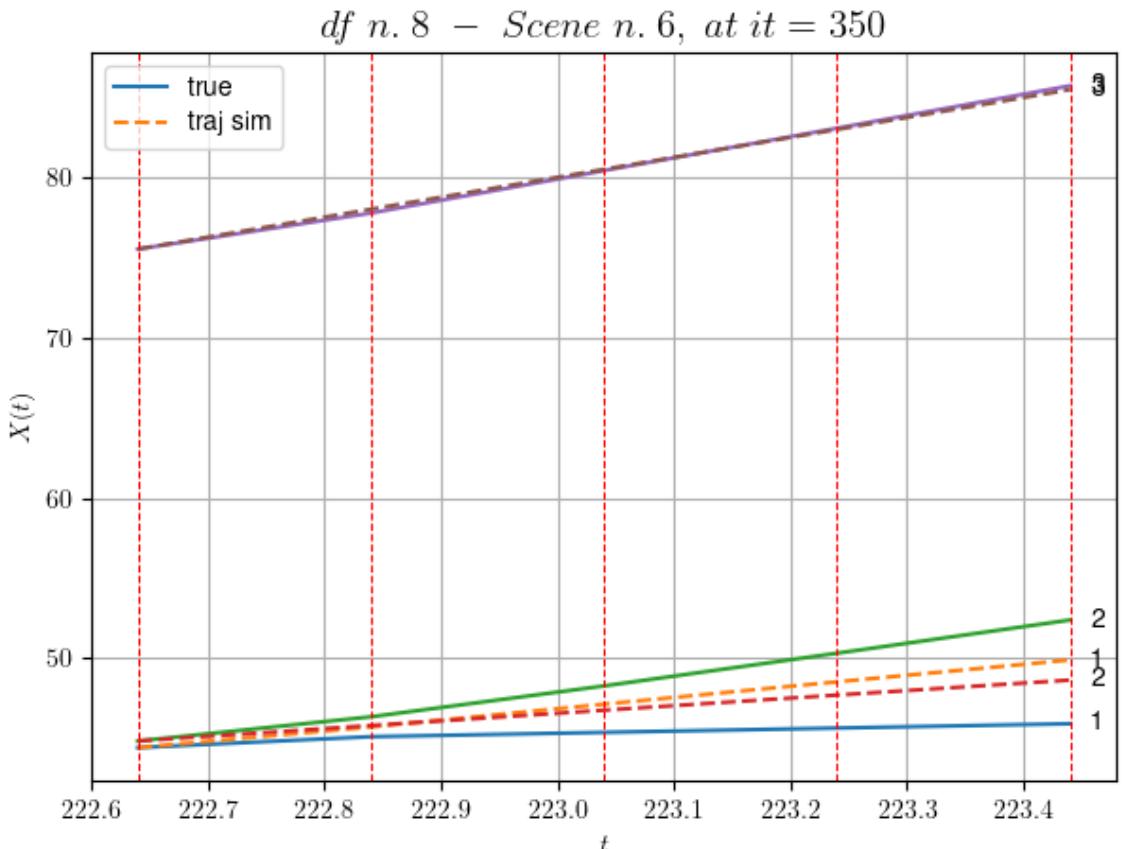
```
- Time interval n.1: [222.84, 223.04]
  * y_true: [1.34614625 9.61287691]
  * v_ann: [7.088357925415039, 4.772531032562256, 12.
```

```
428665091344943]
```

```
- Time interval n.2: [223.04, 223.24]
  * y_true: [ 1.34614625 10.20300693]
  * v_ann: [6.963418960571289, 4.716510772705078, 12.
428665091344943]
```

```
- Time interval n.3: [223.24, 223.44]
  * y_true: [ 1.34614625 10.35053943]
  * v_ann: [6.8267364501953125, 4.670485019683838, 1
2.428665091344943]
```

```
* err= 3.4061783058924875
* Learning rate NN = 4.782968062500004e-06
* diff = 0.025325877164391386
```



For scene 6/21

```
* use LR_NN=1e-05 with err=24.698874693523837 at it=19
* v0_scn_mean = 13.934652118177068
* MAE = 3.4061783058924875
```

```
=====
=====
```

---

```
- Time interval n.0: [225.24, 225.44]
  * y_true: [9.85023046 1.34614625]
  * v_ann: [9.66262435913086, 9.715965270996094, 13.1
```

43805199617391]

- Time interval n.1: [225.44, 225.64]  
\* y\_true: [11.30531094 1.34614625]  
\* v\_ann: [8.569778442382812, 8.402548789978027, 13.  
143805199617391]

43805199617391]

- Time interval n.2: [225.64, 225.84]  
\* y\_true: [12.27536459 1.34614625]  
\* v\_ann: [8.07808780670166, 7.726049900054932, 13.1

43805199617391]

143805199617391]

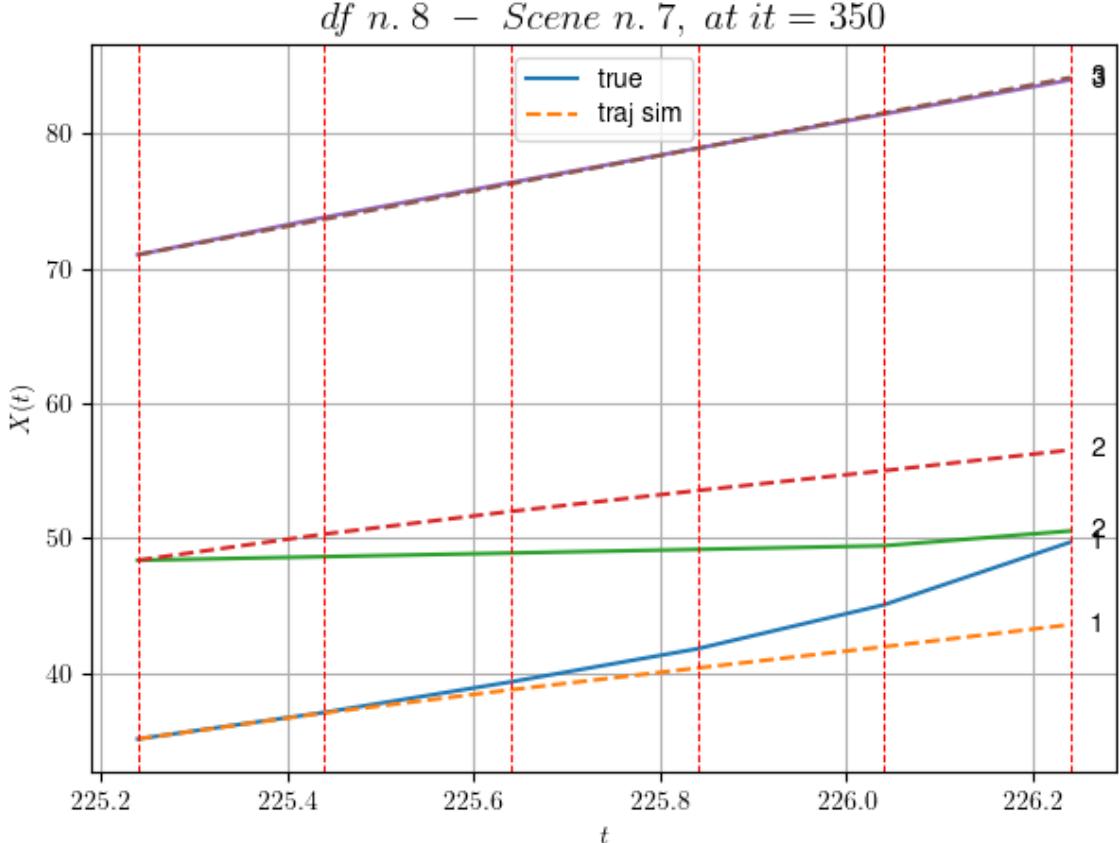
- Time interval n.3: [225.84, 226.04]  
\* y\_true: [16.30233516 1.34614625]  
\* v\_ann: [7.877313137054443, 7.370921611785889, 13.

143805199617391]

3805199617391]

- Time interval n.4: [226.04, 226.24]  
\* y\_true: [23.251759 5.49560672]  
\* v\_ann: [8.20199966430664, 7.68921422958374, 13.14

\* err= 8.218543877130452  
\* Learning rate NN = 0.0003874204121530056  
\* diff = 0.0024159256075293456



For scene 7/21

- \* use LR\_NN=0.001 with err=51.67446144292737 at it=19
- \* v0\_scn\_mean = 14.588499687719553
- \* MAE = 7.924859545075228

---



---

- Time interval n.0: [227.04, 227.24]
- \* y\_true: [ 1.34614625 11.86069537]
- \* v\_ann: [7.919046401977539, 8.472051620483398, 26.

24318261171468]

---

- Time interval n.1: [227.24, 227.44]
- \* y\_true: [ 1.34614625 11.90074479]
- \* v\_ann: [6.1361260414123535, 6.348659038543701, 2

6.24318261171468]

---

- Time interval n.2: [227.44, 227.64]
- \* y\_true: [ 1.34614625 14.03099458]
- \* v\_ann: [6.609355926513672, 6.9278883934021, 26.24

318261171468]

---

- Time interval n.3: [227.64, 227.84]
- \* y\_true: [ 1.34614625 15.45116111]
- \* v\_ann: [7.826601982116699, 8.334715843200684, 26.

24318261171468]

```

-----  

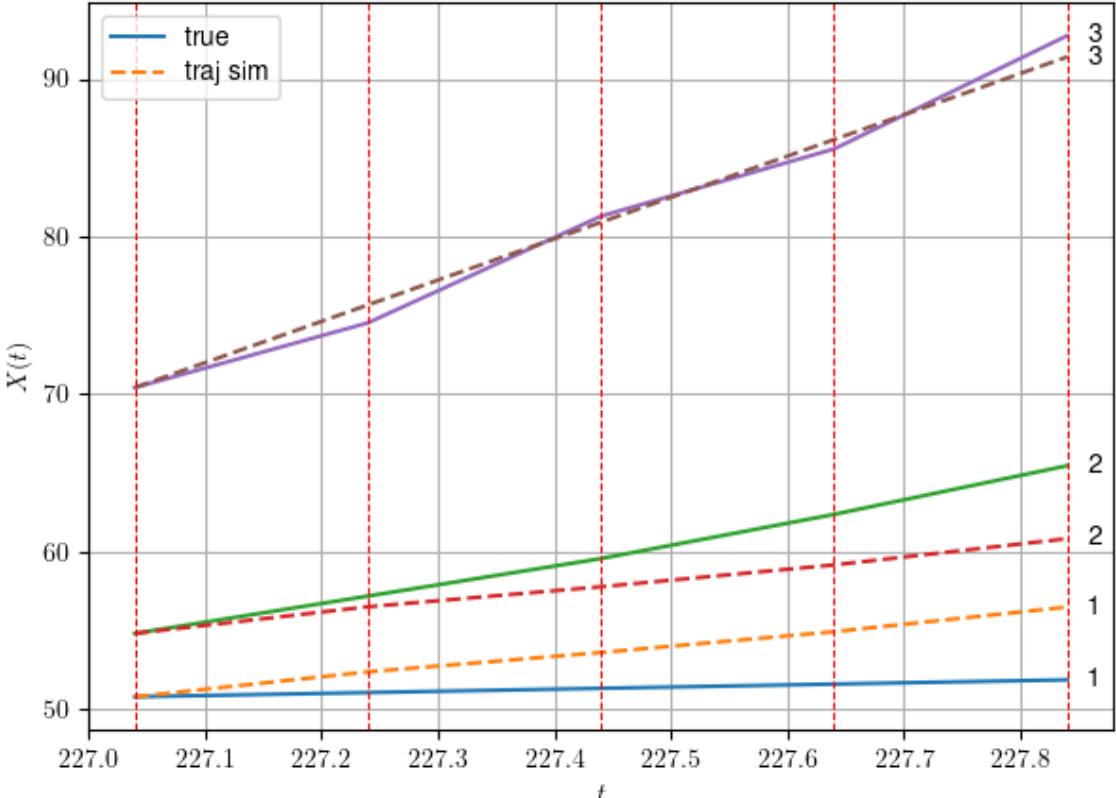
* err= 5.221945174665735  

* Learning rate NN = 0.002391484100371599  

* diff = 0.0006584111594261088

```

*df n. 8 – Scene n. 8, at it = 350*



For scene 8/21

```

* use LR_NN=0.005 with err=2.8647486058031375 at it=19
* v0_scn_mean = 26.56516829341416
* MAE = 5.221945174665735

```

---



---



---

- Time interval n.0: [237.64, 237.84]  
\* y\_true: [17.80043487 10.22573725]  
\* v\_ann: [15.803433418273926, 15.256808280944824, 2  
9.702969638681957]

---



---



---

- Time interval n.1: [237.84, 238.04]  
\* y\_true: [20.29063338 11.60088234]  
\* v\_ann: [14.280683517456055, 14.422944068908691, 2  
9.702969638681957]

---



---

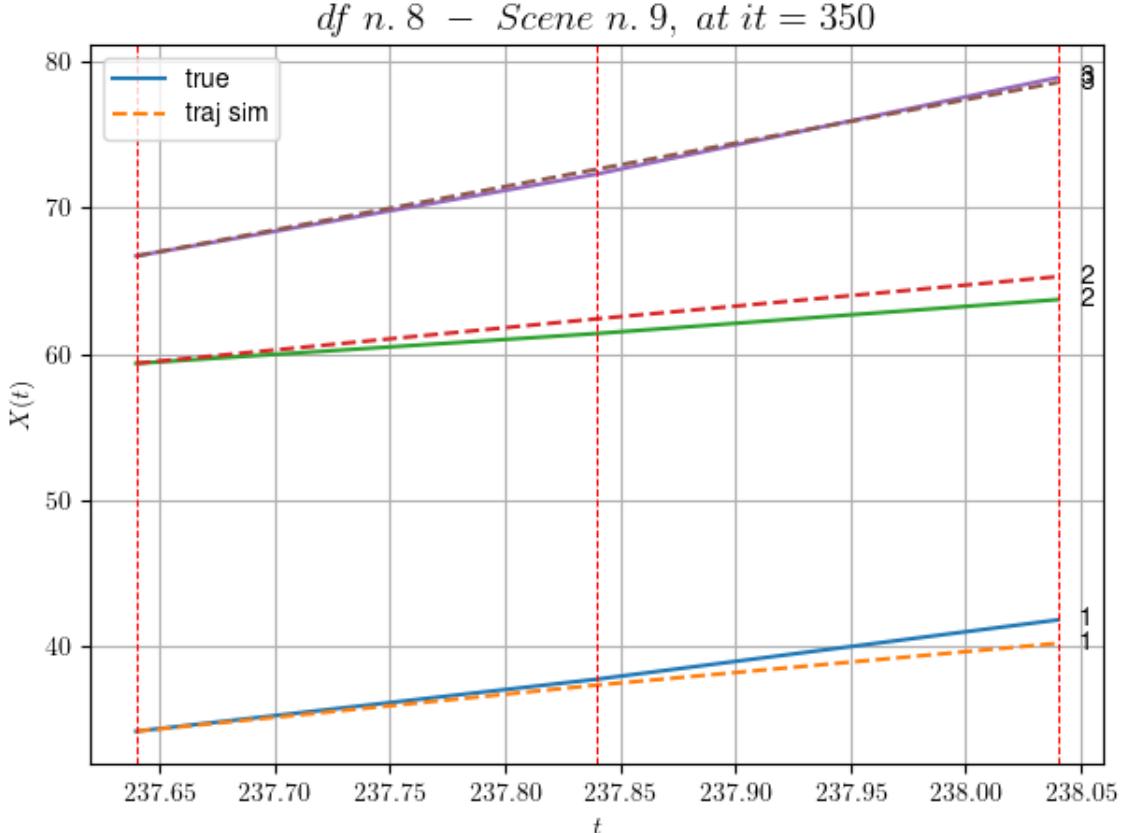


---

```

* err= 0.7134662596165869
* Learning rate NN = 0.0007289999630302191
* diff = 5.982574554863618e-06

```



For scene 9/21

- \* use LR\_NN=0.001 with err=0.4380376904516698 at it=19
- \* v0\_scn\_mean = 29.728427230438445
- \* MAE = 0.328877192649985

---



---

For scene 10/21

- \* use LR\_NN=0.0005 with err=4.276271723360741 at it=19
- \* v0\_scn\_mean = 30.115494083379403
- \* MAE = 0.06335544038134495

---



---

- Time interval n.0: [243.44, 243.64]
  - \* y\_true: [18.26109982 7.28715228]
  - \* v\_ann: [13.53023910522461, 12.17126178741455, 16.743010063526874]

---



---

- Time interval n.1: [243.64, 243.84]
  - \* y\_true: [23.05153691 9.06731774]
  - \* v\_ann: [13.808846473693848, 11.868244171142578, 16.743010063526874]

---



---

- Time interval n.2: [243.84, 244.04]

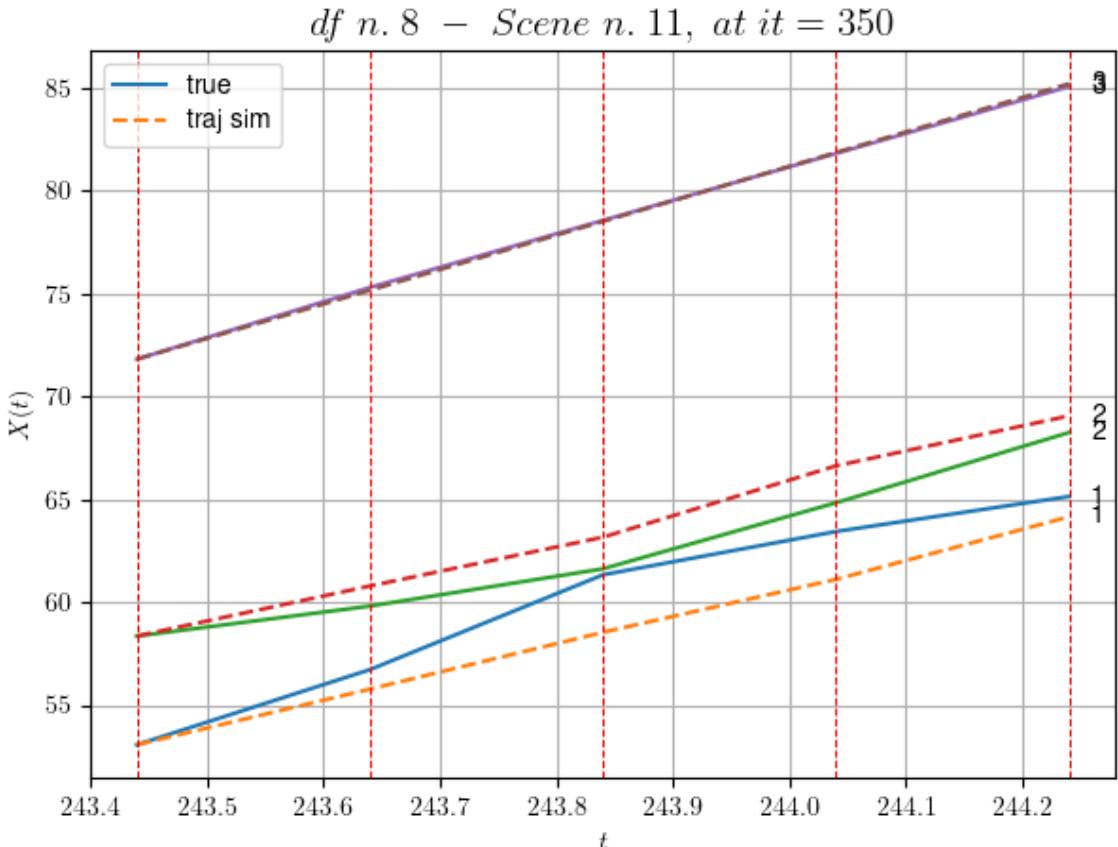
```

* y_true: [10.52334632 16.05532609]
* v_ann: [12.882061958312988, 17.342191696166992, 1
6.743010063526874]

-----
- Time interval n.3: [244.04, 244.24]
* y_true: [ 8.51398229 17.08146048]
* v_ann: [15.207883834838867, 12.150474548339844, 1
6.743010063526874]

-----
* err= 1.486970802761309
* Learning rate NN = 0.002391484100371599
* diff = 0.0015870613460773342

```



For scene 11/21

```

* use LR_NN=0.005 with err=23.55301058764068 at it=19
* v0_scn_mean = 17.879227372169616
* MAE = 1.19397100225737

```

```

=====
=====

- Time interval n.0: [251.64, 251.84]
* y_true: [14.32016282 17.2315068 ]
* v_ann: [12.769160270690918, 15.603952407836914, 1
9.82497961154461]

-----
- Time interval n.1: [251.84, 252.04]

```

```

* y_true: [20.34029568 17.65159646]
* v_ann: [15.023040771484375, 16.036428451538086, 1
9.82497961154461]

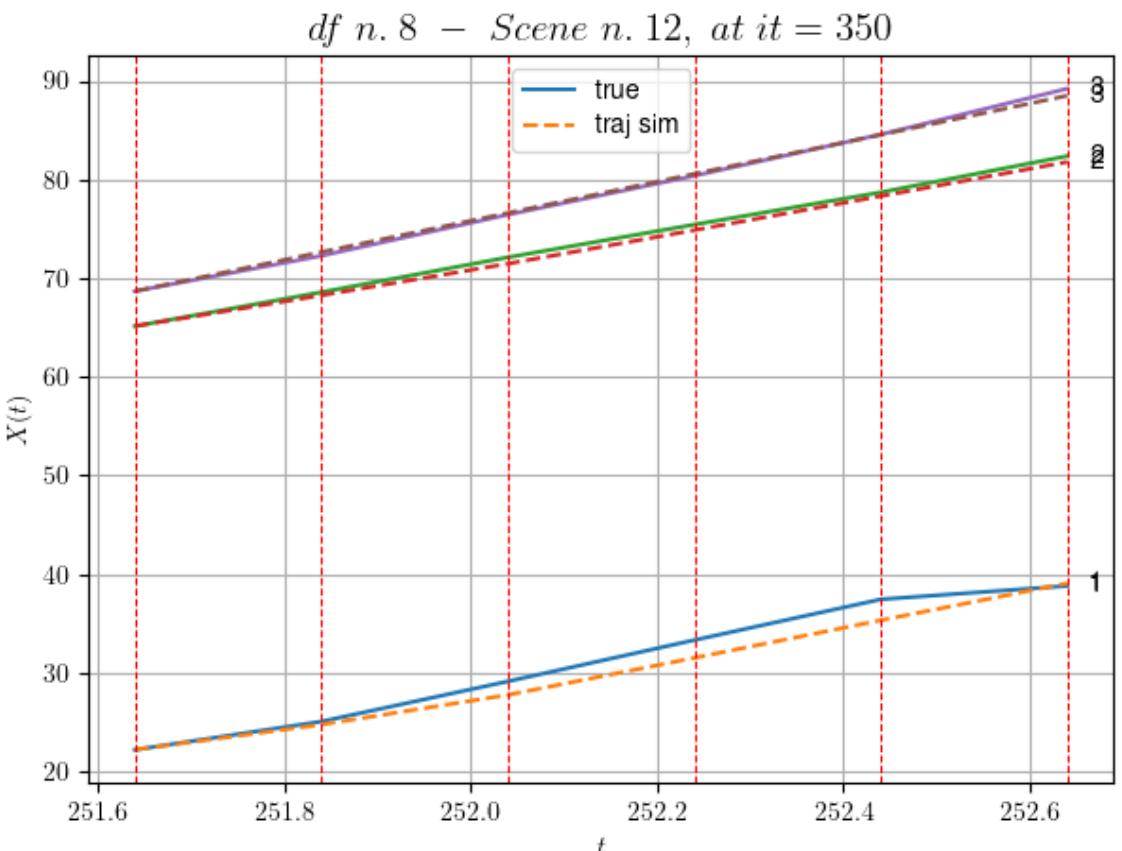
-----
- Time interval n.2: [252.04, 252.24]
* y_true: [20.93040622 16.61174803]
* v_ann: [18.769975662231445, 17.02130699157715, 1
9.82497961154461]

-----
- Time interval n.3: [252.24, 252.44]
* y_true: [20.66049541 16.35178592]
* v_ann: [19.069360733032227, 17.252761840820312, 1
9.82497961154461]

-----
- Time interval n.4: [252.44, 252.64]
* y_true: [ 6.80019415 18.37232882]
* v_ann: [18.800033569335938, 17.323230743408203, 1
9.82497961154461]

-----
* err= 0.6613853803912507
* Learning rate NN = 0.0003874204121530056
* diff = 3.0910604603584524e-05

```



For scene 12/21

```

* use LR_NN=0.001 with err=32.3958984381105 at it=19
* v0_scn_mean = 20.697050446369047

```

\* MAE = 0.6613853803912507

---



---

- Time interval n.0: [290.84, 291.04]  
 \* y\_true: [10.67508652 21.71084933]  
 \* v\_ann: [16.030141830444336, 17.659624099731445, 2  
 5.378277675805748]

---

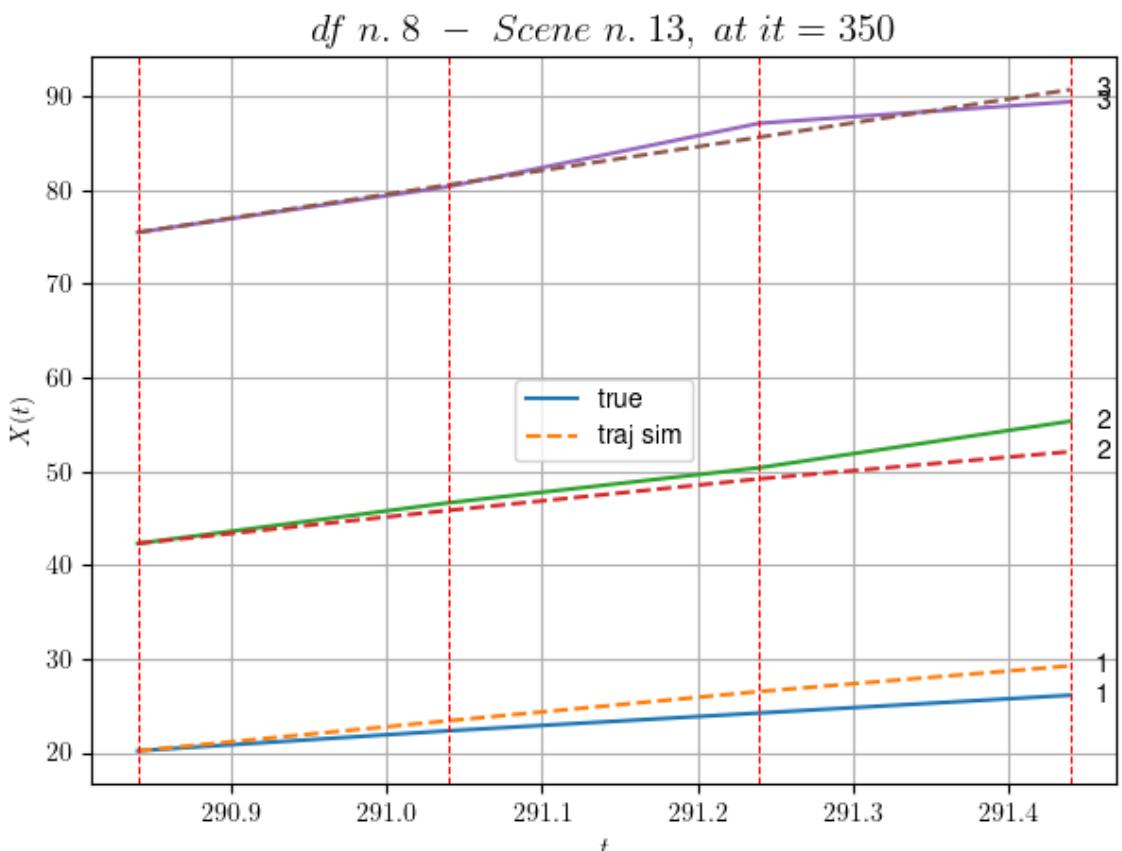
- Time interval n.1: [291.04, 291.24]  
 \* y\_true: [ 9.47510968 18.71084105]  
 \* v\_ann: [15.60049057006836, 16.805034637451172, 2  
 5.378277675805748]

---

- Time interval n.2: [291.24, 291.44]  
 \* y\_true: [ 9.47510968 24.76138307]  
 \* v\_ann: [13.655182838439941, 14.485177993774414, 2  
 5.378277675805748]

---

\* err= 2.731822225292722  
 \* Learning rate NN = 0.0005904899444431067  
 \* diff = 0.0015929442283555417



For scene 13/21

\* use LR\_NN=0.001 with err=2.326597890895313 at it=19  
 \* v0\_scn\_mean = 25.774391795651386

\* MAE = 2.682592558943338

```
=====
=====
- Time interval n.0: [350.64, 350.84]
  * y_true: [14.24956692 9.34769854]
  * v_ann: [16.40984344482422, 17.82744026184082, 24.
017599259794128]

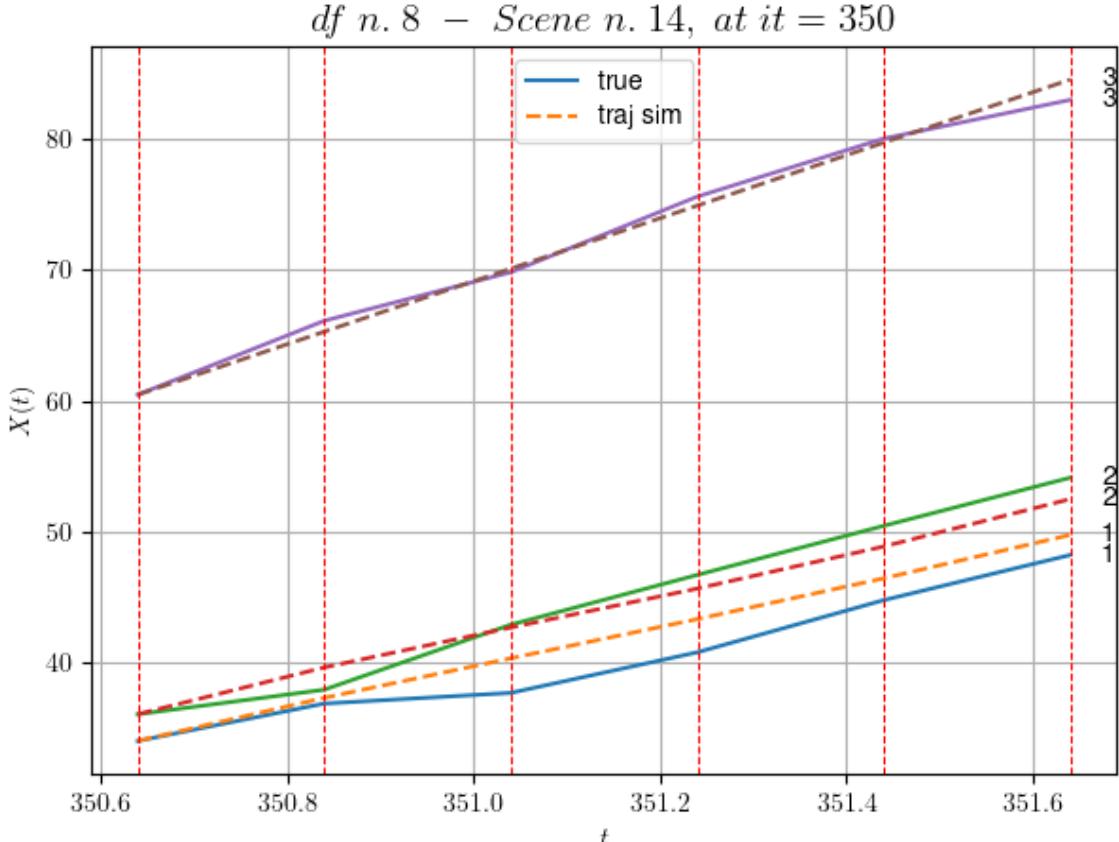
-----
-----
- Time interval n.1: [350.84, 351.04]
  * y_true: [ 4.06677119 24.77080184]
  * v_ann: [15.078886032104492, 15.206696510314941, 2
4.017599259794128]

-----
-----
- Time interval n.2: [351.04, 351.24]
  * y_true: [15.46321179 18.97073364]
  * v_ann: [14.932426452636719, 14.849614143371582, 2
4.017599259794128]

-----
-----
- Time interval n.3: [351.24, 351.44]
  * y_true: [19.89069297 18.71086293]
  * v_ann: [15.561159133911133, 16.045866012573242, 2
4.017599259794128]

-----
-----
- Time interval n.4: [351.44, 351.64]
  * y_true: [17.2007296 18.34097485]
  * v_ann: [16.545934677124023, 18.068571090698242, 2
4.017599259794128]

-----
* err= 1.7493082725673397
* Learning rate NN = 0.0003874204121530056
* diff = 3.480059658644841e-05
```



For scene 14/21

- \* use LR\_NN=0.001 with err=11.627643537914159 at it=19
- \* v0\_scn\_mean = 24.53033309310237
- \* MAE = 1.7493082725673397

---



---

- Time interval n.0: [368.84, 369.04]
- \* y\_true: [17.45059381 8.87536169]
- \* v\_ann: [15.287942886352539, 13.022669792175293, 17.012105849841006]

---



---

- Time interval n.1: [369.04, 369.24]
- \* y\_true: [23.11801305 8.05829994]
- \* v\_ann: [15.293363571166992, 12.681038856506348, 17.012105849841006]

---



---

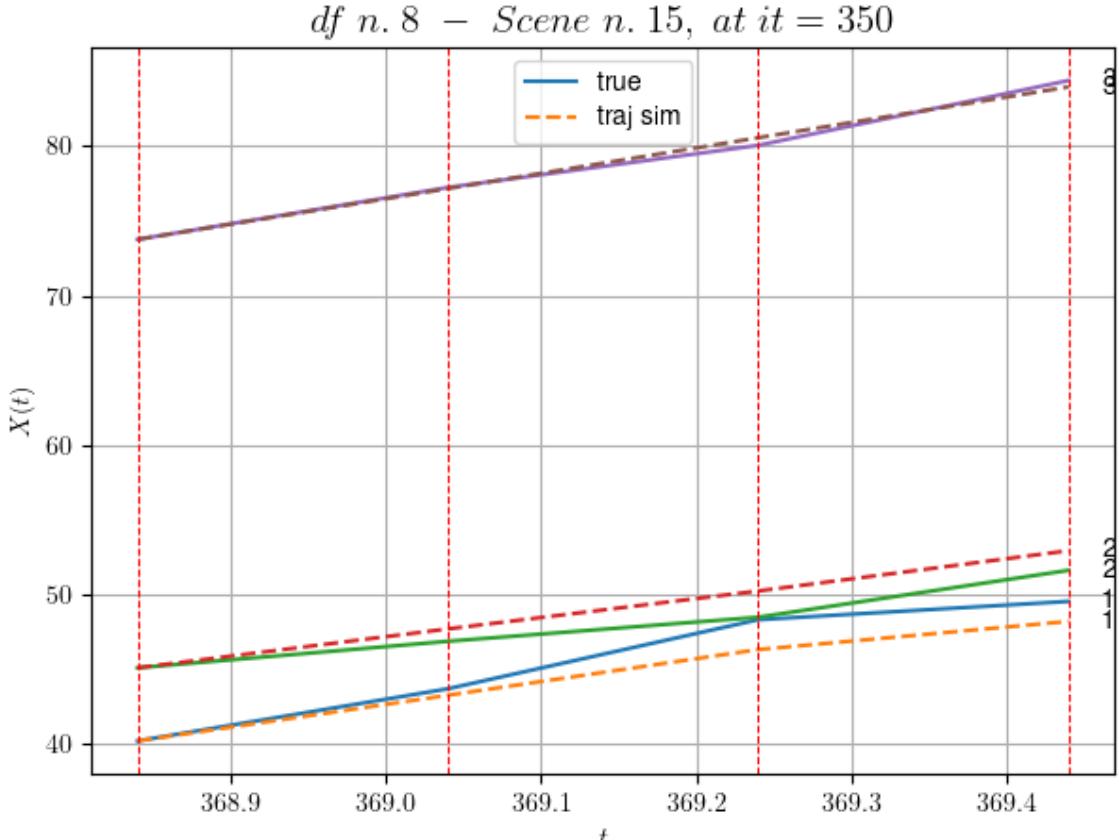
- Time interval n.2: [369.24, 369.44]
- \* y\_true: [ 6.12528304 15.69072344]
- \* v\_ann: [9.425832748413086, 13.497004508972168, 17.012105849841006]

---



---

- \* err= 0.9924252416061762
- \* Learning rate NN = 0.0002952449722215533
- \* diff = 0.0023805778927756815



For scene 15/21

```
* use LR_NN=0.0005 with err=18.581029769336002 at it=19
* v0_scn_mean = 18.125259756342118
* MAE = 0.8500724086162491
```

---



---

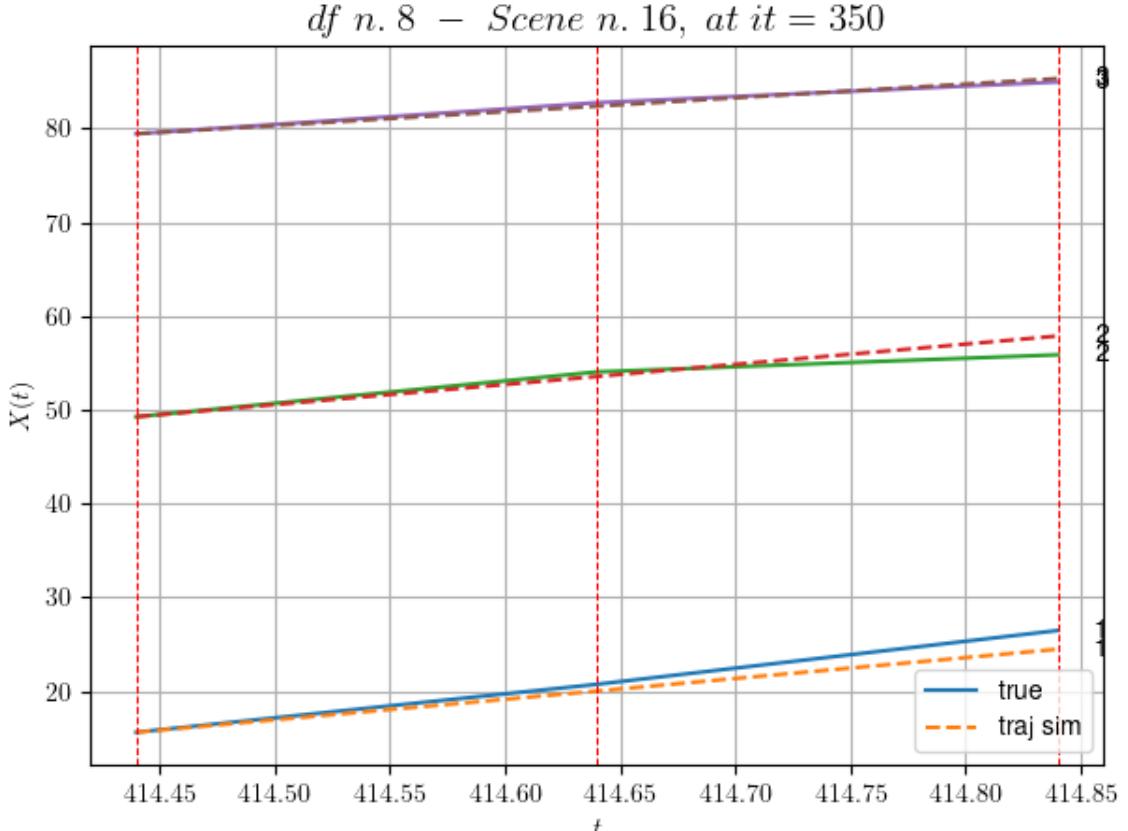
```
- Time interval n.0: [414.44, 414.64]
  * y_true: [25.58017481 23.93124381]
  * v_ann: [21.993837356567383, 21.492666244506836, 1
4.740338902151805]
```

---

```
- Time interval n.1: [414.64, 414.84]
  * y_true: [28.7103211 9.12051681]
  * v_ann: [22.29669761657715, 21.59328269958496, 14.
740338902151805]
```

---

```
* err= 1.0061731843485677
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.00022233731794862877
```



For scene 16/21

```
* use LR_NN=5e-05 with err=6.065743015568681 at it=19
* v0_scn_mean = 16.048199219349087
* MAE = 1.0061731843485677
```

---



---

```
- Time interval n.0: [477.84, 478.04]
* y_true: [17.90015387 15.74042221]
* v_ann: [18.743167877197266, 18.829832077026367, 2
1.26822239699199]
```

---

```
- Time interval n.1: [478.04, 478.24]
* y_true: [18.02021575 17.32056356]
* v_ann: [18.626806259155273, 18.663837432861328, 2
1.26822239699199]
```

---

```
- Time interval n.2: [478.24, 478.44]
* y_true: [20.95033635 22.3908747 ]
* v_ann: [18.57052993774414, 18.57819938659668, 21.
26822239699199]
```

---

```
- Time interval n.3: [478.44, 478.64]
* y_true: [19.80040923 17.17076636]
* v_ann: [18.749380111694336, 18.85662078857422, 2
```

1.26822239699199]

---

- Time interval n.4: [478.64, 478.84]
  - \* y\_true: [18.07046469 19.89107551]
  - \* v\_ann: [18.726428985595703, 18.83405113220215, 2

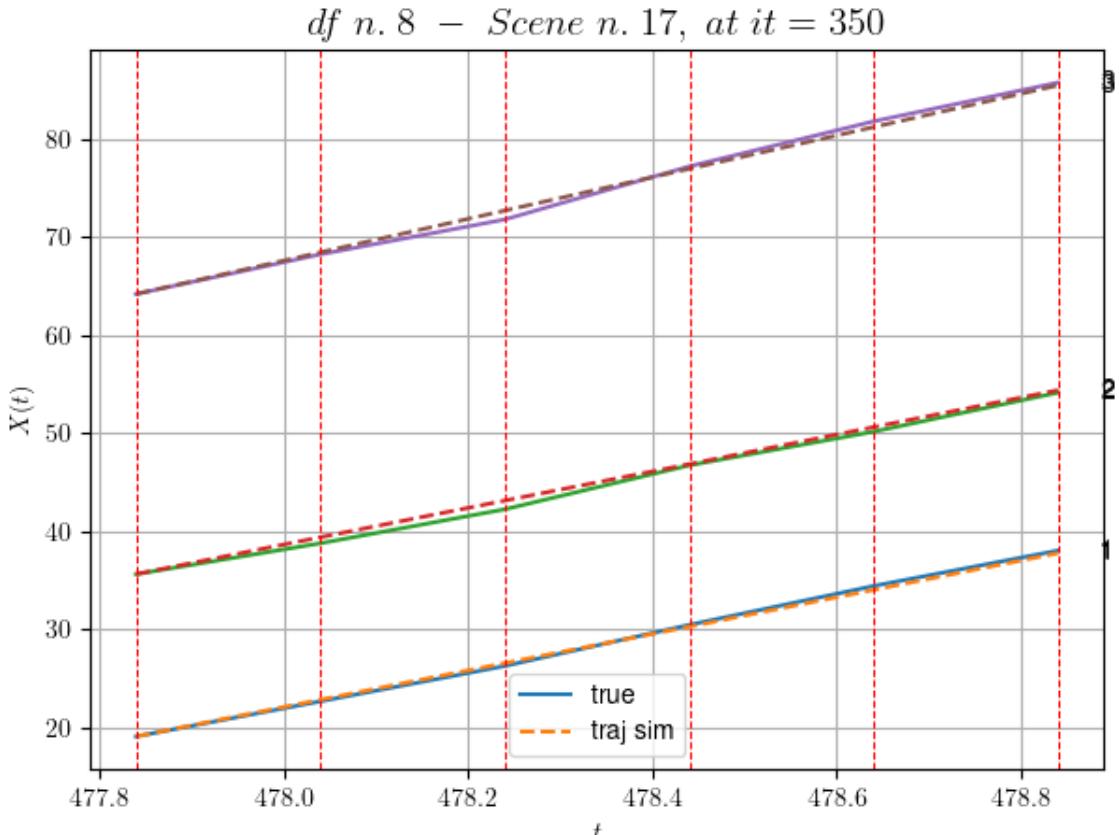
1.26822239699199]

---



---

- \* err= 0.17686454862594347
- \* Learning rate NN = 3.874203684972599e-05
- \* diff = 0.00016156202785413964



For scene 17/21

- \* use LR\_NN=0.0001 with err=16.13646738537351 at it=19
- \* v0\_scn\_mean = 22.016597171001806
- \* MAE = 0.17686454862594347

---



---



---

- Time interval n.0: [522.64, 522.84]
  - \* y\_true: [ 6.78505349 16.71042372]
  - \* v\_ann: [13.57499885559082, 13.933087348937988, 2

5.15600788472012]

---



---

- Time interval n.1: [522.84, 523.04]
  - \* y\_true: [ 7.85007105 23.28071684]
  - \* v\_ann: [13.44108772277832, 13.692818641662598, 2

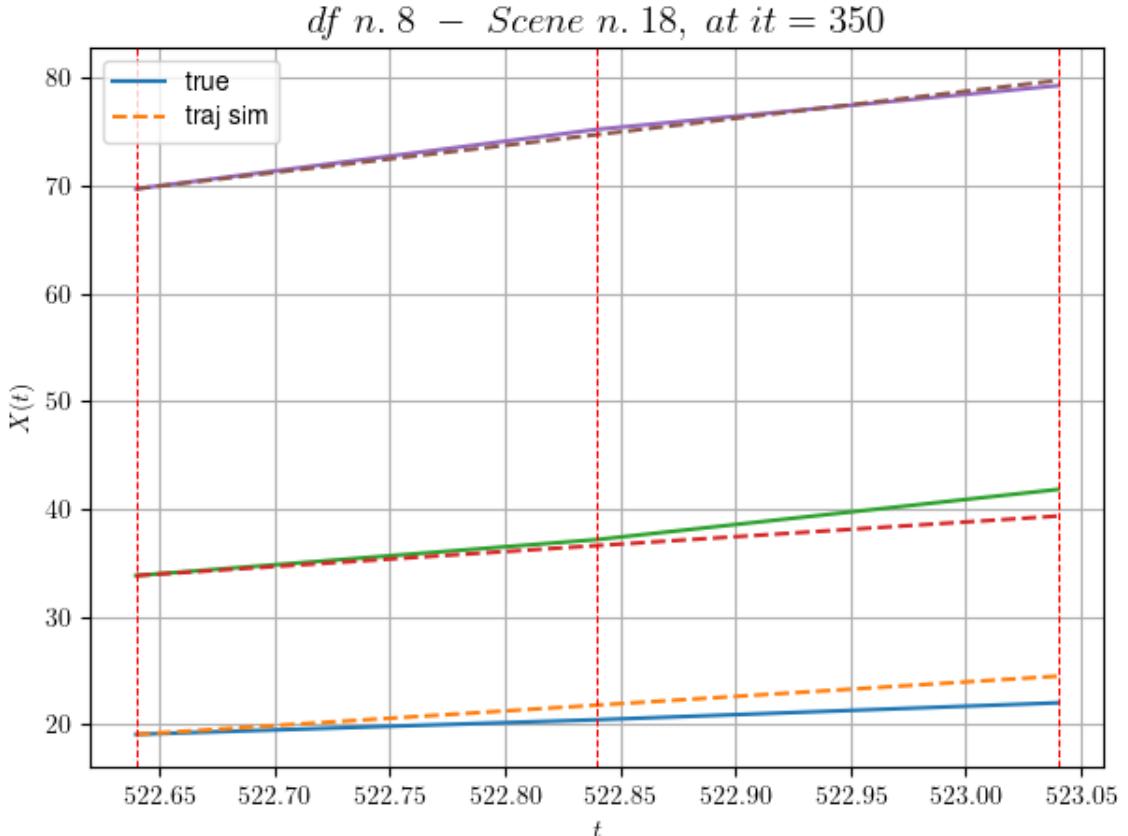
5.15600788472012]

---



---

```
* err= 1.6528019475872913
* Learning rate NN = 7.289998757187277e-05
* diff = 0 0010676816165531763
```



For scene 18/21

```
* use LR_NN=0.0001 with err=0.8769931513471986 at it=19
* v0_scn_mean = 25.571172089467968
* MAE = 1.6528019475872913
```

---



---



---



---

```
- Time interval n.0: [593.04, 593.24]
* y_true: [18.14041096 18.46062677]
* v_ann: [18.79123878479004, 19.069679260253906, 2
0.297906154933845]
```

---



---



---

```
- Time interval n.1: [593.24, 593.44]
* y_true: [15.67042287 23.16095213]
* v_ann: [18.740686416625977, 18.894468307495117, 2
0.297906154933845]
```

---



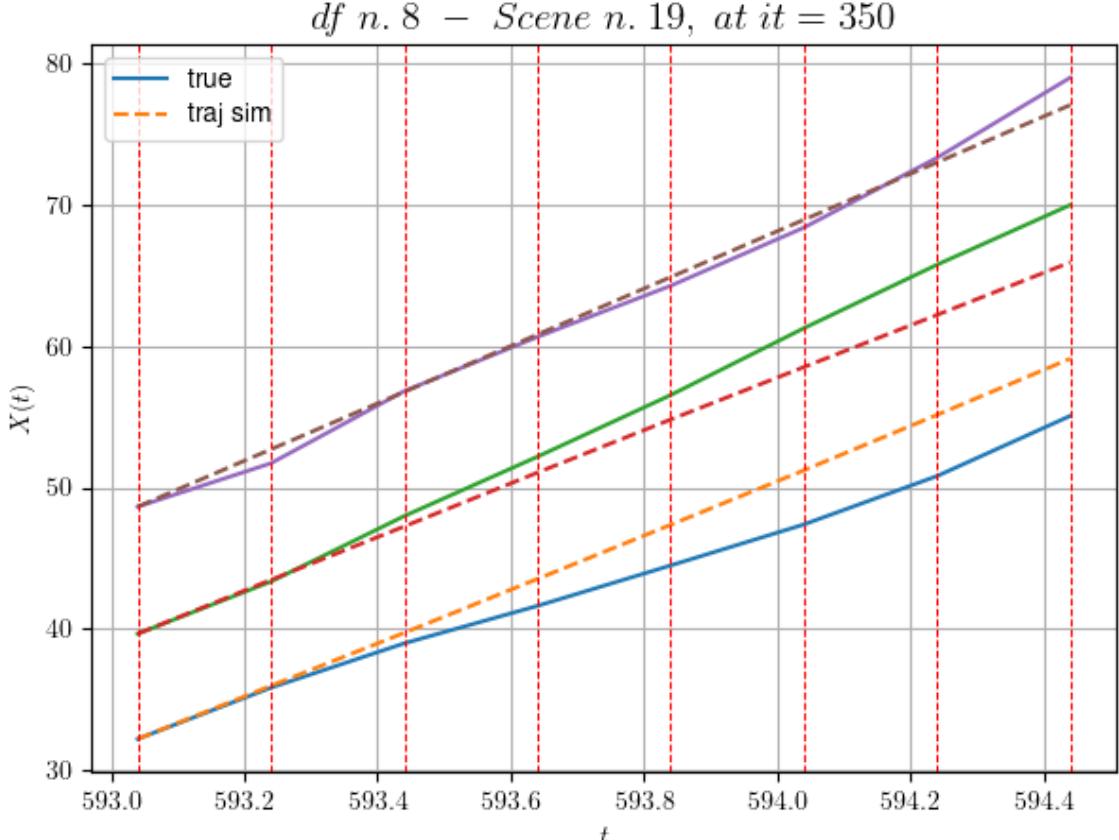
---



---

```
- Time interval n.2: [593.44, 593.64]
* y_true: [13.25043489 21.00101152]
* v_ann: [19.067617416381836, 19.03805160522461, 2
0.297906154933845]
```

```
-----  
-----  
    - Time interval n.3: [593.64, 593.84]  
      * y_true: [14.30052292 21.80126526]  
      * v_ann: [19.133834838867188, 18.773908615112305, 2  
0.297906154933845]  
  
-----  
-----  
    - Time interval n.4: [593.84, 594.04]  
      * y_true: [14.50059166 23.66159236]  
      * v_ann: [19.287477493286133, 18.552936553955078, 2  
0.297906154933845]  
  
-----  
-----  
    - Time interval n.5: [594.04, 594.24]  
      * y_true: [17.13492662 22.4617536 ]  
      * v_ann: [19.615249633789062, 18.46190071105957, 2  
0.297906154933845]  
  
-----  
-----  
    - Time interval n.6: [594.24, 594.44]  
      * y_true: [21.29116558 21.12188145]  
      * v_ann: [19.886716842651367, 18.61298942565918, 2  
0.297906154933845]  
  
-----  
-----  
* err= 4.551453643603584  
* Learning rate NN = 0.00012709324073512107  
* diff = 0.0009633428142112876
```



For scene 19/21

- \* use LR\_NN=0.0005 with err=30.652235969000895 at it=19
- \* v0\_scn\_mean = 21.129443857659577
- \* MAE = 4.551453643603584

---



---

- Time interval n.0: [256.44, 256.64]
  - \* y\_true: [ 7.48303167 10.07767618 21.73093279]
  - \* v\_ann: [11.27326774597168, 15.307741165161133, 1  
5.69576358795166, 17.106091873677283]

---

- Time interval n.1: [256.64, 256.84]
  - \* y\_true: [13.09283525 13.17831107 21.42106847]
  - \* v\_ann: [16.114652633666992, 16.144750595092773, 1  
5.098642349243164, 17.106091873677283]

---

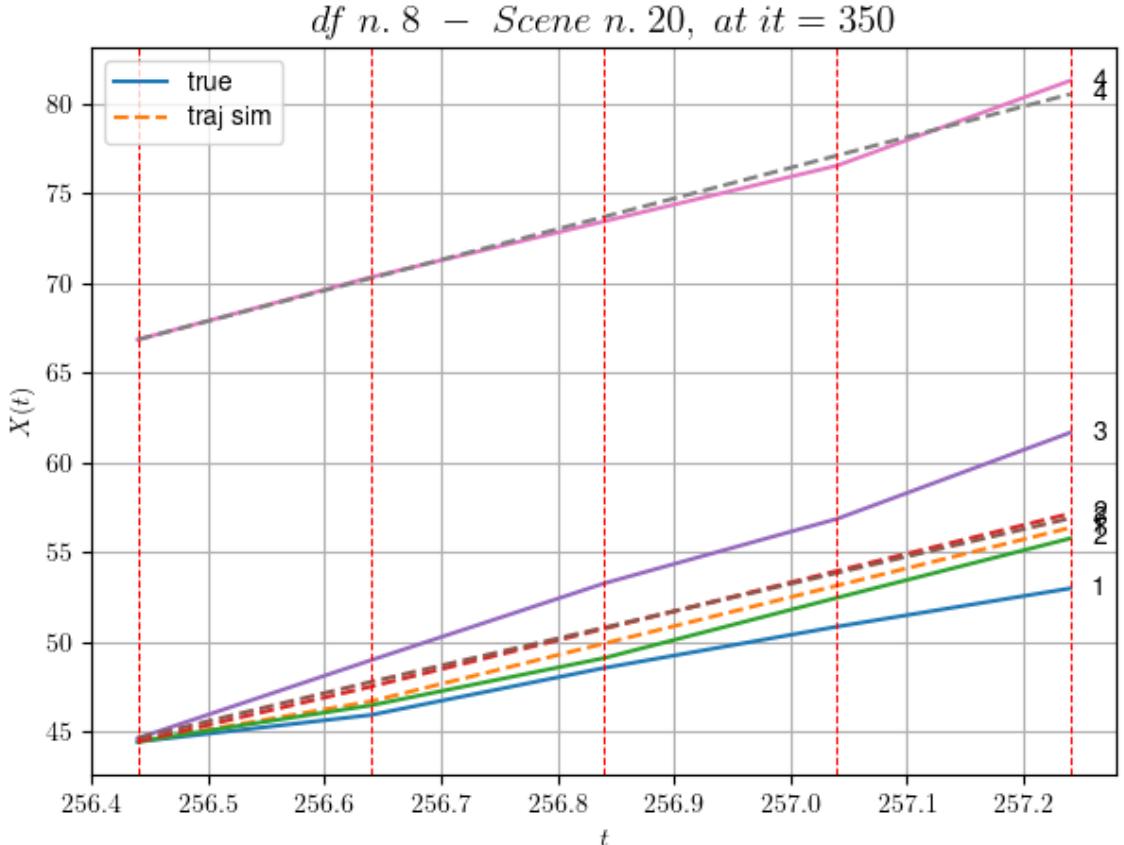
- Time interval n.2: [256.84, 257.04]
  - \* y\_true: [11.5255681 16.82586504 17.99104223]
  - \* v\_ann: [16.154682159423828, 16.09823226928711, 1  
5.289798736572266, 17.106091873677283]

---

- Time interval n.3: [257.04, 257.24]
  - \* y\_true: [10.66053629 16.53589178 24.03163218]
  - \* v\_ann: [16.124059677124023, 15.984601974487305, 1

5.217838287353516, 17.106091873677283]

```
* err= 3.370261595859107  
* Learning rate NN = 0.000478296831715852  
* diff = 0.0011660792818517507
```



For scene 20/21

```
* use LR_NN=0.001 with err=18.717874211113788 at it=19  
* v0_scn_mean = 18.577811484123593  
* MAE = 3.3045756698967392
```

For df=8 with 21 scenes, time taken: 236.66

In df n.9/10 we have 9 scenes

```
***** - Time : * y_ * v_ 9.0811137199231031
```

```
- Time interval n.0: [5.40, 5.60]
  * y_true: [17.46255149 32.38946228]
  * y_ANN: [26.482248306274414. 26.955896377563477. 2
```

- Time interval n.1: [5.60, 5.80]

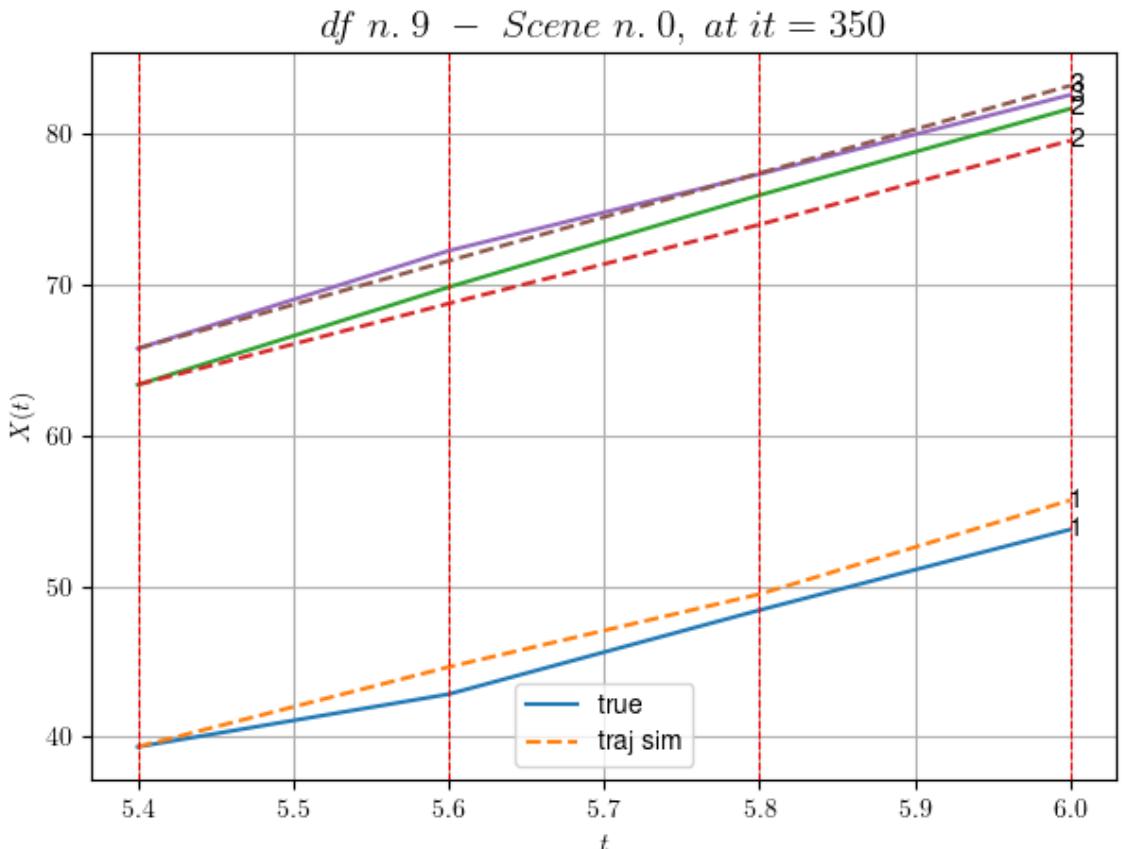
```

* y_true: [27.89361325 30.52270411]
* v_ann: [24.16565704345703, 26.192485809326172, 2
9.081113719923103]

-----
- Time interval n.2: [5.80, 6.00]
* y_true: [26.75613901 28.6867411 ]
* v_ann: [31.18028450012207, 27.88939666748047, 29.
081113719923103]

-----
* err= 1.5362533703984473
* Learning rate NN = 0.0005904899444431067
* diff = 0.00016663385691706445

```



For scene 0/9

```

* use LR_NN=0.001 with err=29.097662498836282 at it=19
* v0_scn_mean = 29.159868739056456
* MAE = 1.2740587697071997
=====
```

For scene 1/9

```

* use LR_NN=0.001 with err=14.686070931388544 at it=19
* v0_scn_mean = 32.4599909897823
* MAE = 0.1438486094691862
=====
```

```
- Time interval n.0: [37.80, 38.00]
  * y_true: [21.35828745 27.25004814]
  * v_ann: [21.636341094970703, 21.82838249206543, 2
3.639097032447108]

-----
- Time interval n.1: [38.00, 38.20]
  * y_true: [19.23626153 17.91519282]
  * v_ann: [22.60835075378418, 22.485485076904297, 2
3.639097032447108]

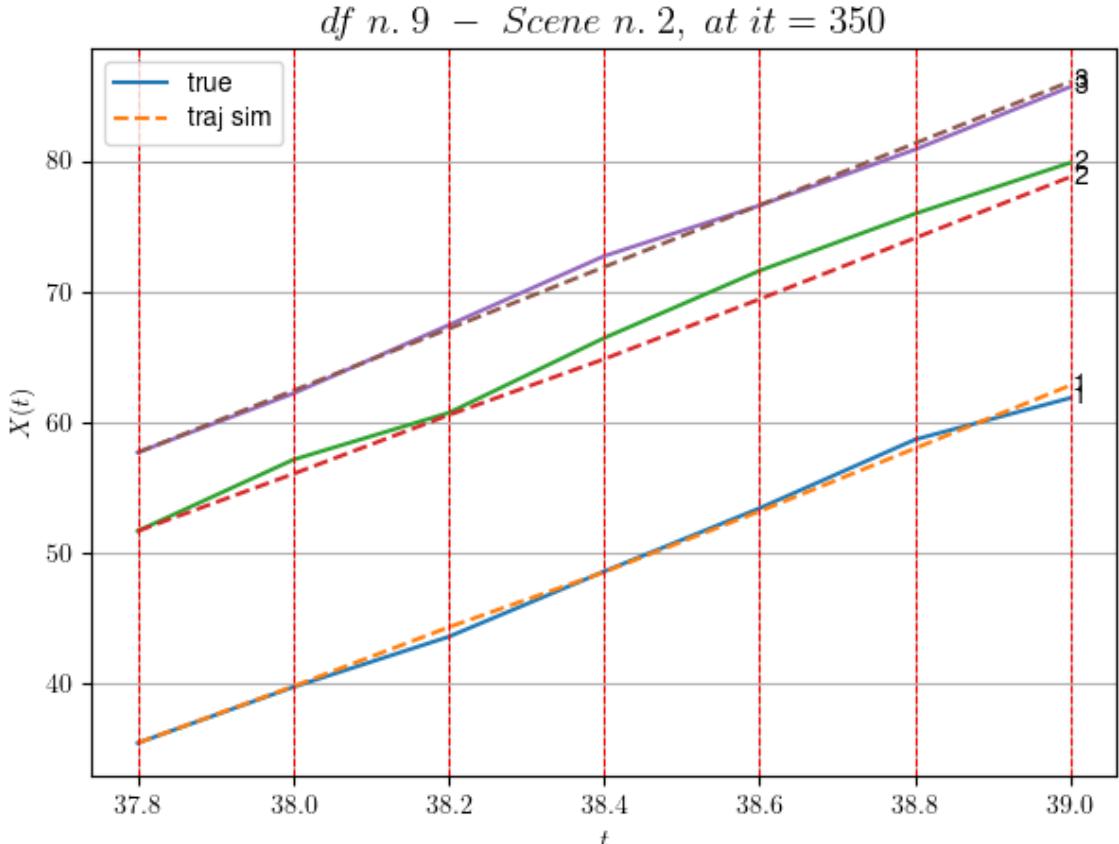
-----
- Time interval n.2: [38.20, 38.40]
  * y_true: [24.96063116 28.62771944]
  * v_ann: [21.062110900878906, 21.42646598815918, 2
3.639097032447108]

-----
- Time interval n.3: [38.40, 38.60]
  * y_true: [24.1844348 25.71934895]
  * v_ann: [23.26470947265625, 22.908357620239258, 2
3.639097032447108]

-----
- Time interval n.4: [38.60, 38.80]
  * y_true: [26.26418379 21.80127307]
  * v_ann: [24.067827224731445, 23.353605270385742, 2
3.639097032447108]

-----
- Time interval n.5: [38.80, 39.00]
  * y_true: [15.9216195 19.51476921]
  * v_ann: [24.1109676361084, 23.42057228088379, 23.6
39097032447108]

-----
* err= 0.7779964062734129
* Learning rate NN = 0.00031381050939671695
* diff = 0.0005810008807953793
```



For scene 2/9

- \* use LR\_NN=0.001 with err=39.49935035707844 at it=19
- \* v0\_scn\_mean = 24.184271169635398
- \* MAE = 0.7604253746311339

---



---

- Time interval n.0: [44.40, 44.60]
- \* y\_true: [24.95803839 22.94664651]
- \* v\_ann: [25.85934829711914, 26.19890594482422, 18.016193314109287]

---



---

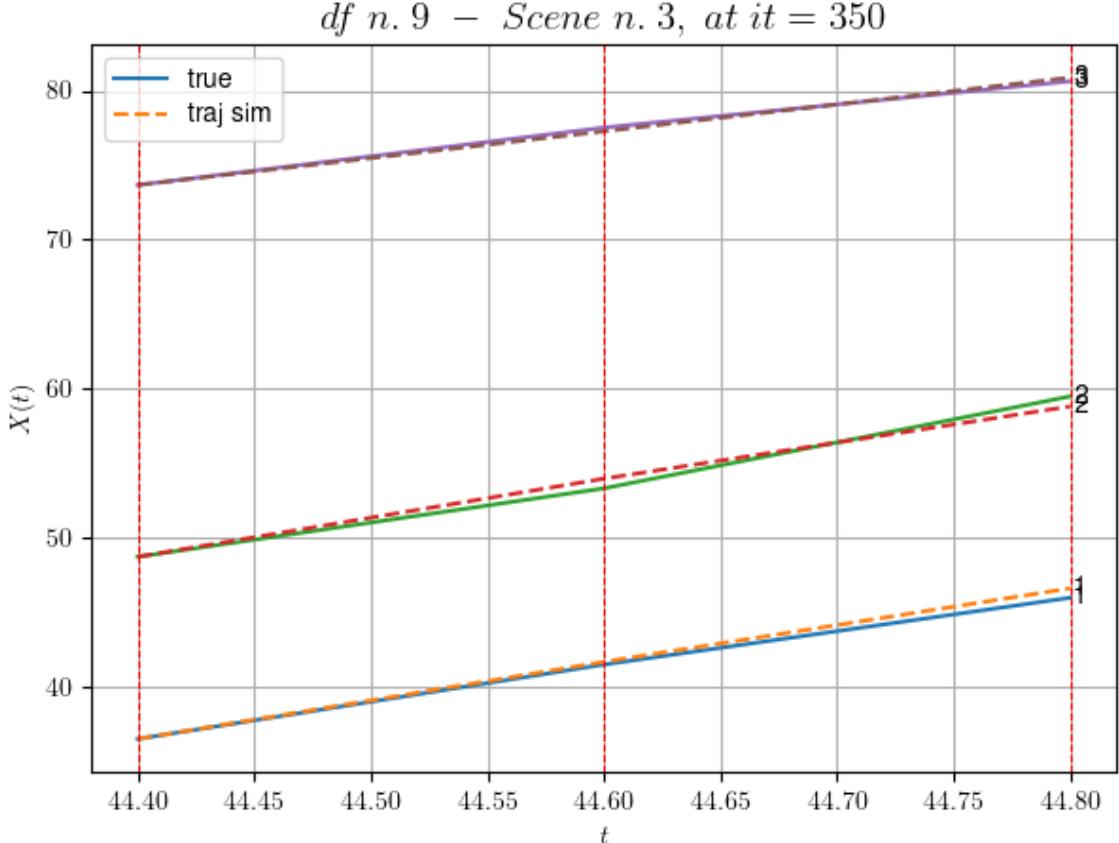
- Time interval n.1: [44.60, 44.80]
- \* y\_true: [22.38974011 30.85088397]
- \* v\_ann: [24.655689239501953, 24.2393856048584, 18.016193314109287]

---



---

- \* err= 0.15895671071176018
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 3.096332978486105e-05



For scene 3/9

- \* use LR\_NN=0.0005 with err=5.49634370997168 at it=19
- \* v0\_scn\_mean = 19.043289860549013
- \* MAE = 0.1573934309409676

---



---

- Time interval n.0: [117.80, 118.00]
- \* y\_true: [26.21501314 26.51617559]
- \* v\_ann: [25.822561264038086, 25.49262809753418, 3  
2.94780433300785]

---



---

- Time interval n.1: [118.00, 118.20]
- \* y\_true: [24.27291409 32.45579962]
- \* v\_ann: [25.897388458251953, 25.61943244934082, 3  
2.94780433300785]

---



---

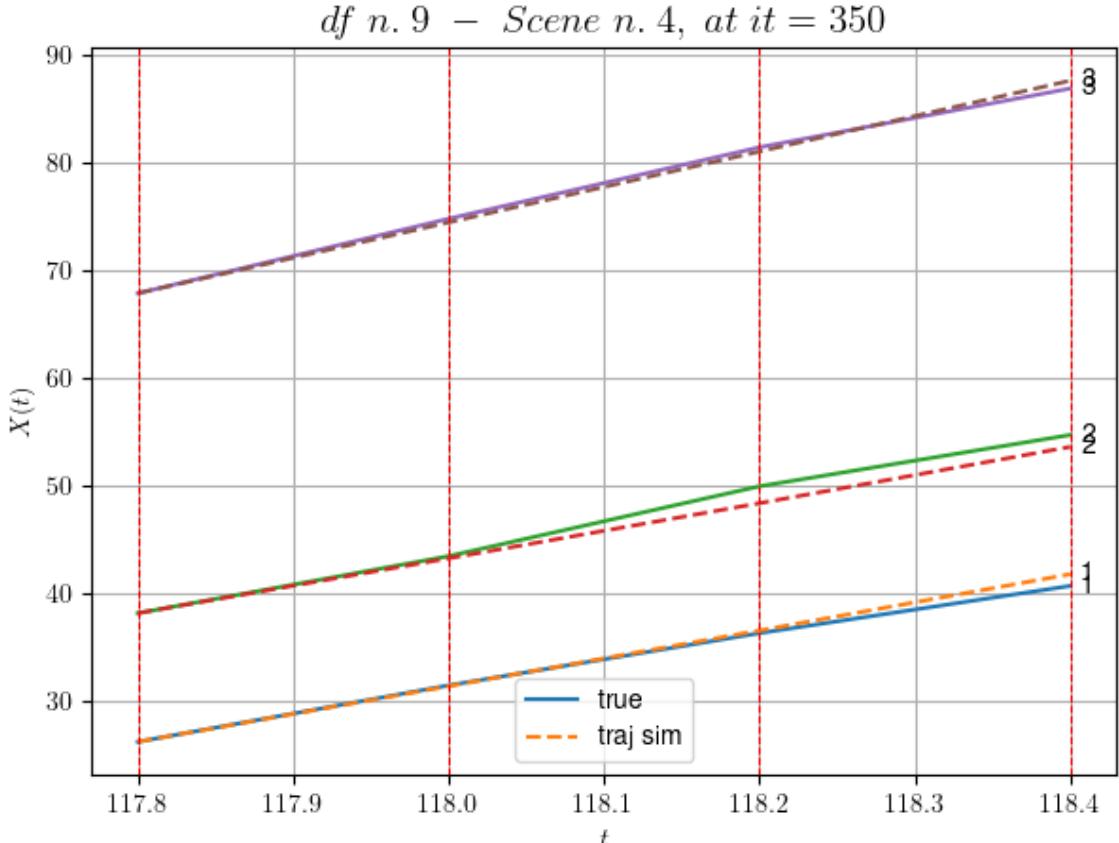
- Time interval n.2: [118.20, 118.40]
- \* y\_true: [21.96072195 23.86482679]
- \* v\_ann: [26.173593521118164, 26.185243606567383, 3  
2.94780433300785]

---



---

- \* err= 0.4829576246852443
- \* Learning rate NN = 5.904899080633186e-05
- \* diff = 8.638212776218568e-05



For scene 4/9

```
* use LR_NN=0.0001 with err=7.459190571943178 at it=19
* v0_scn_mean = 32.695156762050566
* MAE = 0.4639476641714781
```

---



---

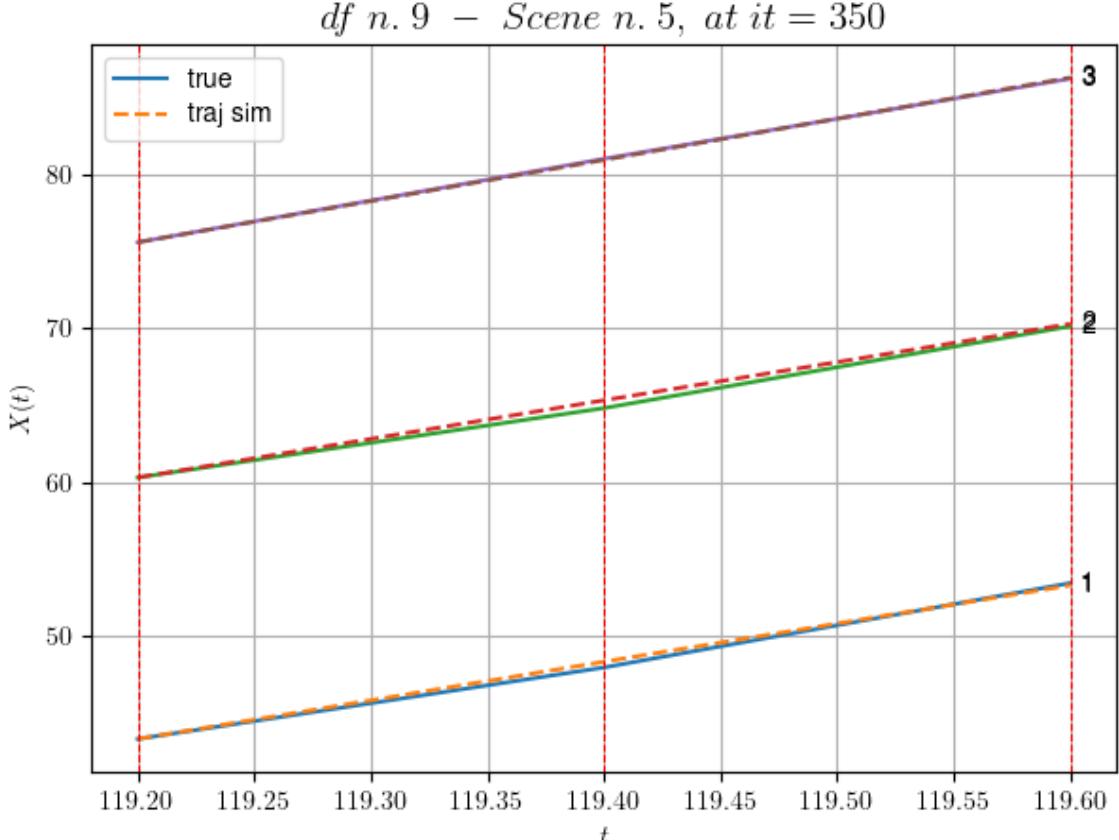
```
- Time interval n.0: [119.20, 119.40]
* y_true: [23.20444186 22.52067771]
* v_ann: [25.067319869995117, 25.065181732177734, 2
6.734613425844156]
```

---

```
- Time interval n.1: [119.40, 119.60]
* y_true: [27.39348249 26.5570173 ]
* v_ann: [24.79079818725586, 24.796791076660156, 2
6.734613425844156]
```

---

```
* err= 0.050565676997356056
* Learning rate NN = 7.289998757187277e-05
* diff = 3.0166665350023214e-05
```



For scene 5/9

- \* use LR\_NN=0.0001 with err=0.29589373042643946 at it=19
- \* v0\_scn\_mean = 27.014480029254457
- \* MAE = 0.050565676997356056

---



---

- Time interval n.0: [120.20, 120.40]
- \* y\_true: [30.48045094 26.16776015]
- \* v\_ann: [26.70256233215332, 27.079845428466797, 27.349006463344075]

---



---

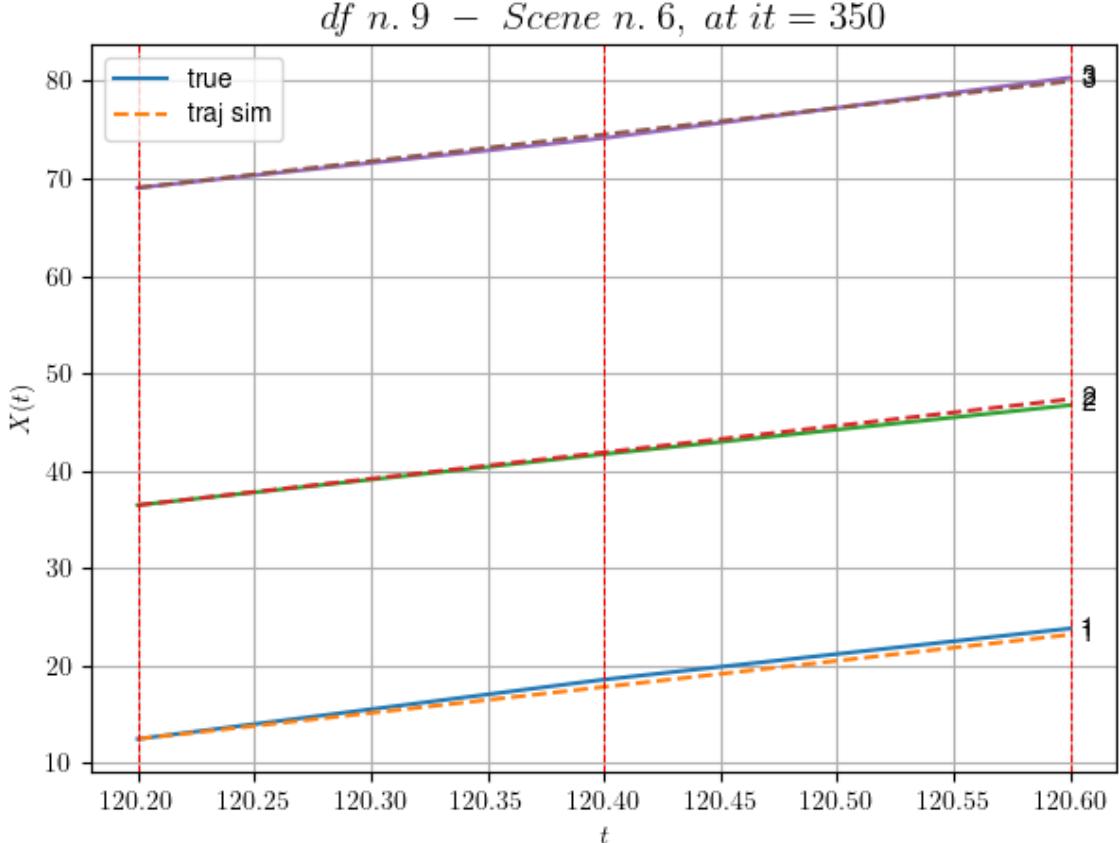
- Time interval n.1: [120.40, 120.60]
- \* y\_true: [26.23623075 25.12734403]
- \* v\_ann: [26.842609405517578, 27.309593200683594, 27.349006463344075]

---



---

- \* err= 0.1856315997407987
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 0.00014096404542340846



For scene 6/9

- \* use LR\_NN=5e-05 with err=1.6225398445595165 at it=19
- \* v0\_scn\_mean = 27.576215260807313
- \* MAE = 0.1856315997407987

---



---

- Time interval n.0: [121.40, 121.60]
- \* y\_true: [23.88369588 31.34452269]
- \* v\_ann: [25.71468162536621, 26.13770294189453, 28.657538135052054]

---



---

- Time interval n.1: [121.60, 121.80]
- \* y\_true: [22.66516063 24.1738881 ]
- \* v\_ann: [26.545494079589844, 28.00457000732422, 28.657538135052054]

---



---

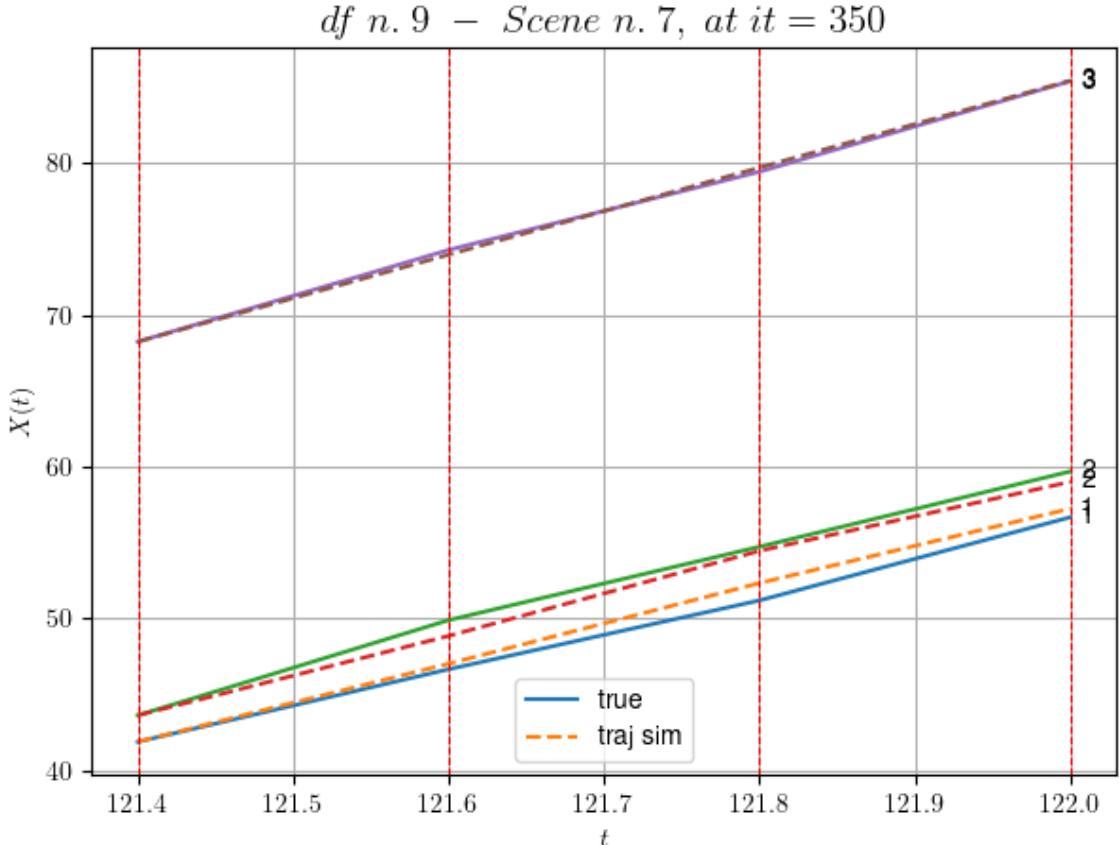
- Time interval n.2: [121.80, 122.00]
- \* y\_true: [27.39865086 24.79107704]
- \* v\_ann: [24.517671585083008, 22.747560501098633, 28.657538135052054]

---



---

- \* err= 0.2965882491168627
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 2.783590509769507e-05



For scene 7/9

```
* use LR_NN=0.001 with err=9.789928960678786 at it=19
* v0_scn_mean = 28.772596561923798
* MAE = 0.23092766909732787
```

---



---

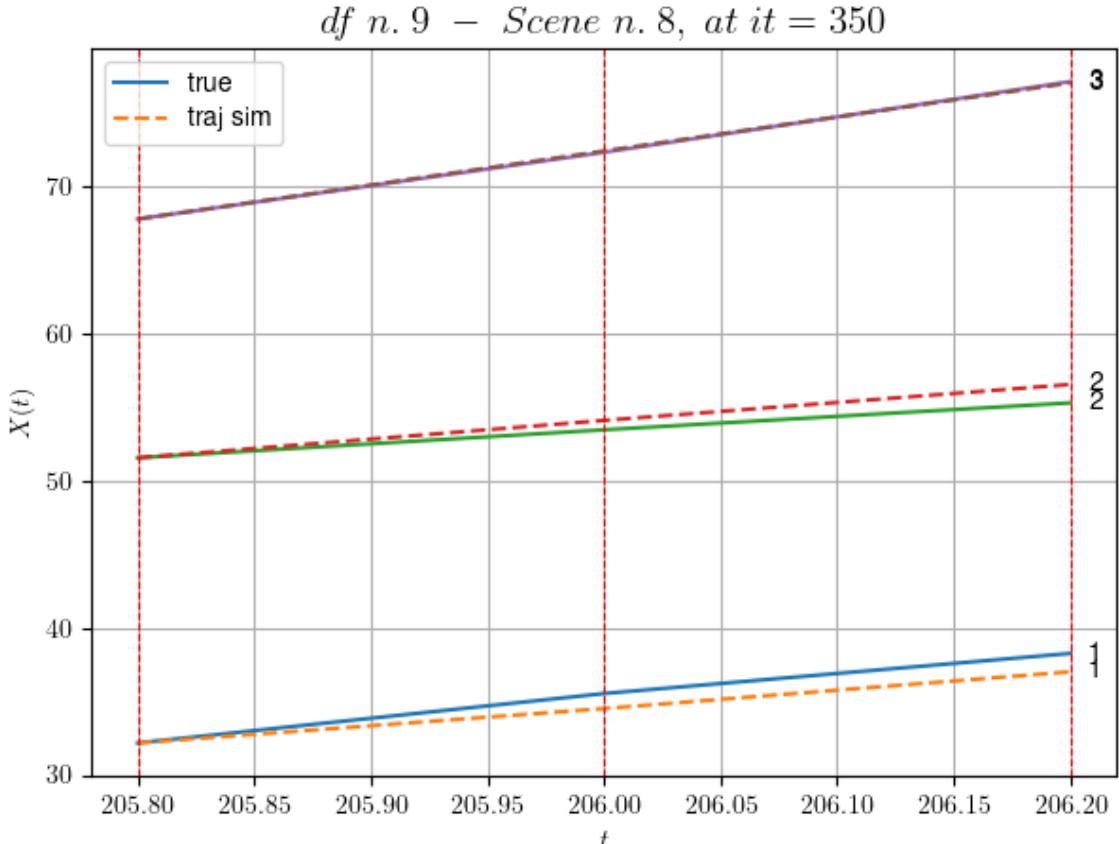
```
- Time interval n.0: [205.80, 206.00]
  * y_true: [16.81767795  9.52209489]
  * v_ann: [11.702332496643066, 12.722373962402344, 2
3.158700610445457]
```

---

```
- Time interval n.1: [206.00, 206.20]
  * y_true: [13.65726133  9.1692133 ]
  * v_ann: [12.515006065368652, 12.222976684570312, 2
3.158700610445457]
```

---

```
* err= 0.5116316251893969
* Learning rate NN = 0.00036449998151510954
* diff = 0.00048000932704306276
```



For scene 8/9

\* use LR\_NN=0.0005 with err=1.3367725159738144 at it=19  
 \* v0\_scn\_mean = 23.74504810088364  
 \* MAE = 0.5116316251893969

For df=9 with 9 scenes, time taken: 80.50

In df n.10/10 we have 22 scenes

\*\*\*\*\*  
 \*\*\*\*\*

- Time interval n.0: [25.72, 25.92]  
 \* y\_true: [19.85100065 23.2716 ]  
 \* v\_ann: [24.07280731201172, 23.924606323242188, 1

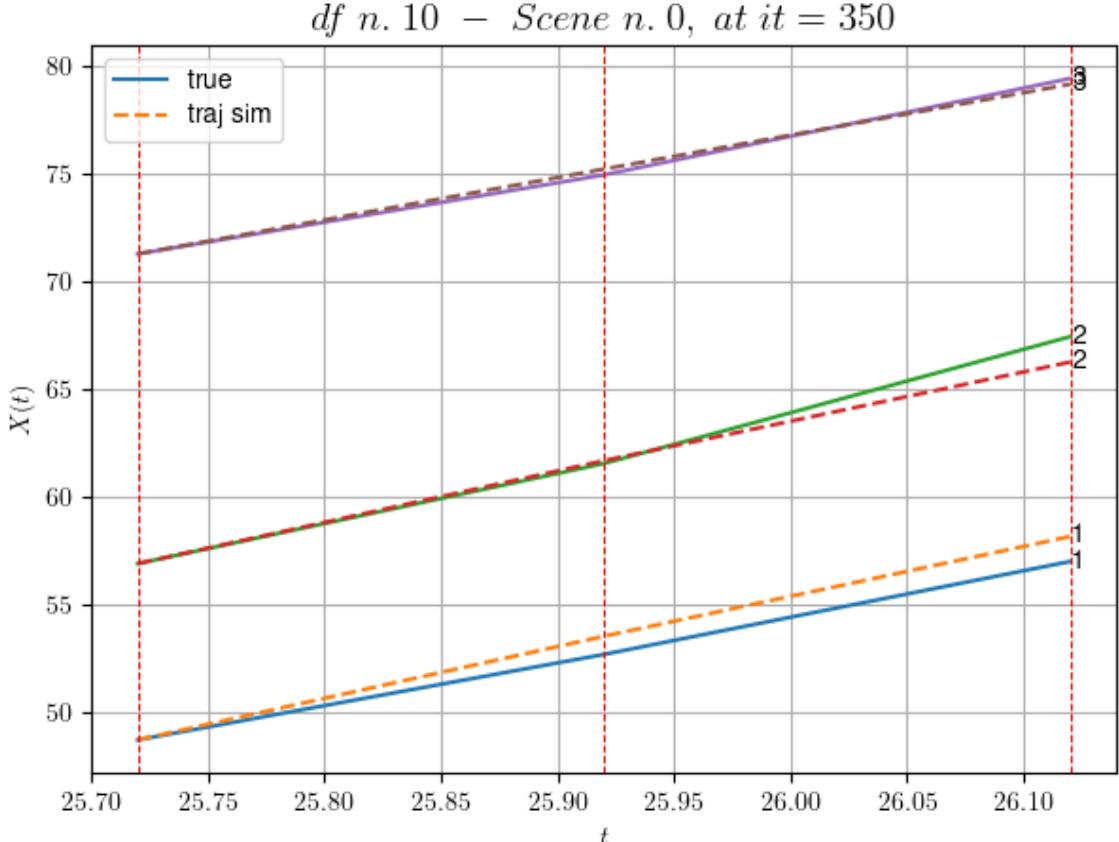
9.70885794583036]

-----  
 -----  
 - Time interval n.1: [25.92, 26.12]  
 \* y\_true: [21.59125574 29.46240542]  
 \* v\_ann: [23.18168067932129, 22.911376953125, 19.70

885794583036]

-----  
 -----  
 \* err= 0.40198591188159233

\* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.00010787483522628483



For scene 0/22

\* use LR\_NN=0.0005 with err=2.7435272841129614 at it=19  
 \* v0\_scn\_mean = 20.59088122439368  
 \* MAE = 0.40198591188159233

---



---

- Time interval n.0: [71.72, 71.92]
  - \* y\_true: [25.44045996 0.68637625]
  - \* v\_ann: [15.824912071228027, 17.110977172851562, 2 4.696218424736625]

---

- Time interval n.1: [71.92, 72.12]
  - \* y\_true: [ 7.65710886 16.8398502 ]
  - \* v\_ann: [13.36272144317627, 19.652875900268555, 2 4.696218424736625]

---

- Time interval n.2: [72.12, 72.32]
  - \* y\_true: [ 0.68637625 22.9307169 ]
  - \* v\_ann: [14.124980926513672, 19.737686157226562, 2 4.696218424736625]

---

- Time interval n.3: [72.32, 72.52]

```

* y_true: [ 6.45821063 27.07107802]
* v_ann: [16.063844680786133, 19.424617767333984, 2
4.696218424736625]

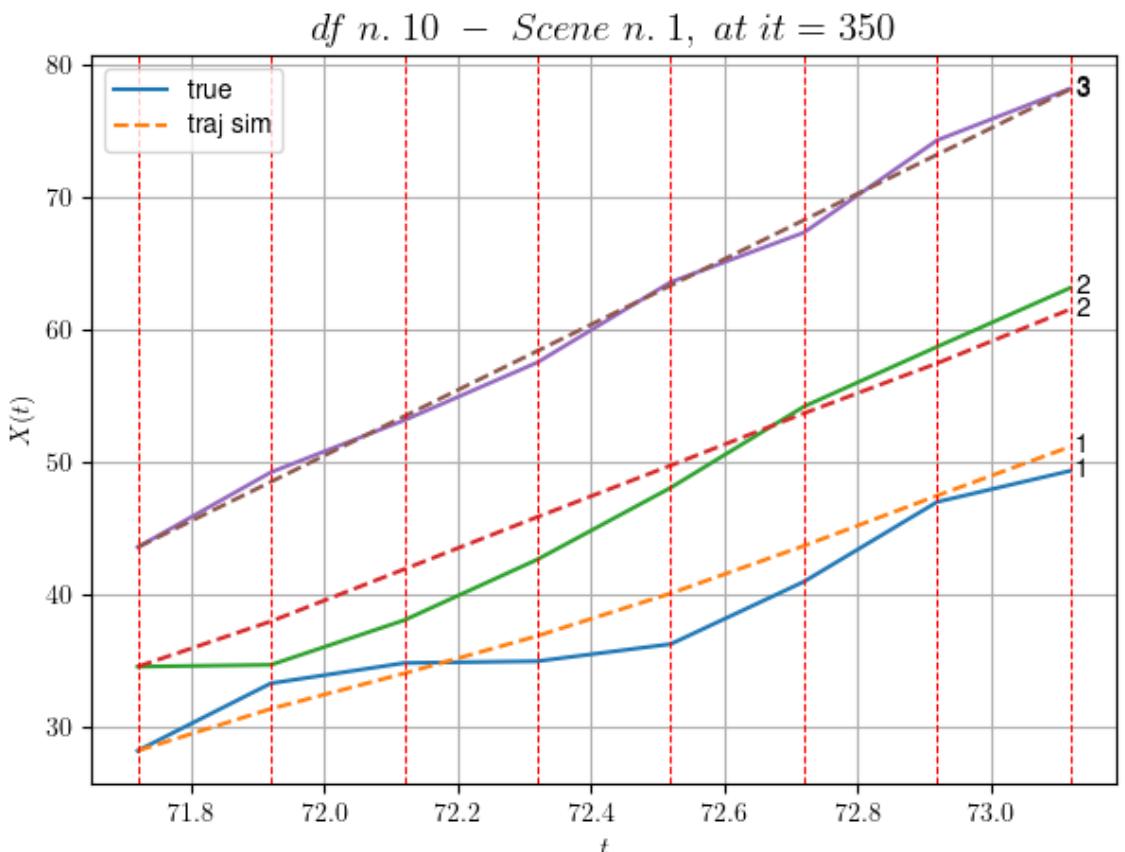
-----
- Time interval n.4: [72.52, 72.72]
* y_true: [23.5506867 30.63154479]
* v_ann: [17.94757652282715, 19.67900276184082, 24.
696218424736625]

-----
- Time interval n.5: [72.72, 72.92]
* y_true: [30.10113572 22.57136168]
* v_ann: [18.941652297973633, 18.90114402770996, 2
4.696218424736625]

-----
- Time interval n.6: [72.92, 73.12]
* y_true: [11.75053045 22.24158734]
* v_ann: [18.50977897644043, 20.391408920288086, 2
4.696218424736625]

-----
* err= 3.337598328651913
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.008261984210879092

```



```

For scene 1/22
* use LR_NN=0.0001 with err=12.187547047116505 at it=19
* v0_scn_mean = 25.150789821105807

```

\* MAE = 3.337598328651913

---



---

- Time interval n.0: [120.92, 121.12]  
 \* y\_true: [2.40007998 4.01291198]  
 \* v\_ann: [7.416305065155029, 7.205214977264404, 19.  
 875509421847788]

---

- Time interval n.1: [121.12, 121.32]  
 \* y\_true: [3.94779745 3.96114827]  
 \* v\_ann: [7.137763500213623, 7.493175506591797, 19.  
 875509421847788]

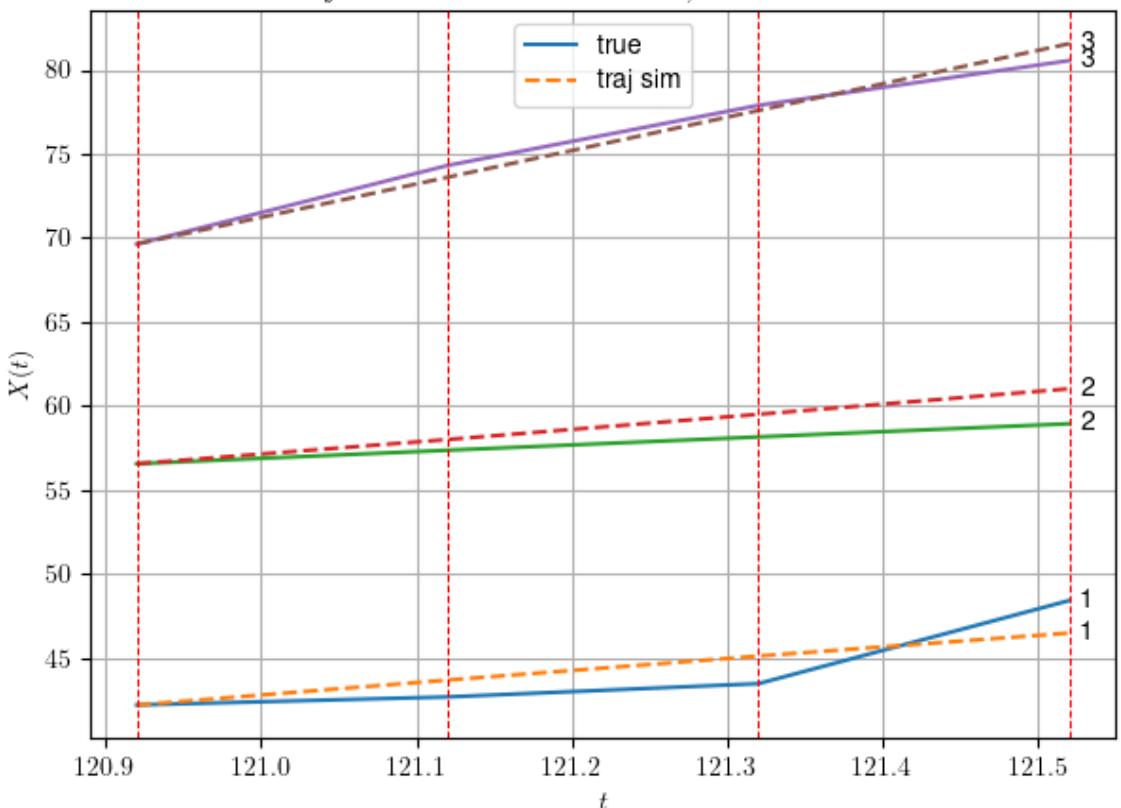
---

- Time interval n.2: [121.32, 121.52]  
 \* y\_true: [24.74097787 3.92663913]  
 \* v\_ann: [6.854091167449951, 7.612768650054932, 19.  
 875509421847788]

---

\* err= 1.299766796066064  
 \* Learning rate NN = 5.904899080633186e-05  
 \* diff = 0.00013290997472692467

*df n. 10 – Scene n. 2, at it = 350*



For scene 2/22

\* use LR\_NN=0.0001 with err=6.717919884499094 at it=19  
 \* v0\_scn\_mean = 20.743249496420685

\* MAE = 1.2946784634066013

---



---

- Time interval n.0: [122.12, 122.32]  
 \* y\_true: [20.84138029 3.6661027 ]  
 \* v\_ann: [8.44815731048584, 8.823358535766602, 27.5  
 27697849634308]

---

- Time interval n.1: [122.32, 122.52]  
 \* y\_true: [11.80149783 9.92593948]  
 \* v\_ann: [13.233185768127441, 11.877361297607422, 2  
 7.527697849634308]

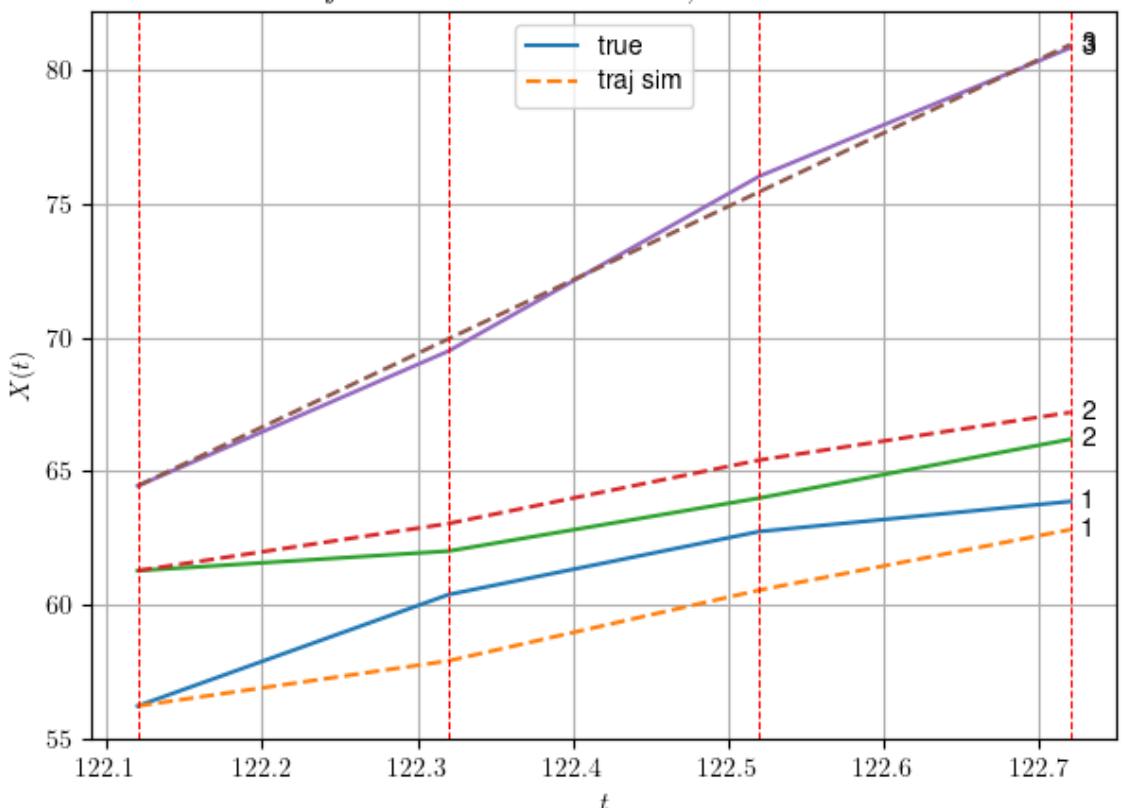
---

- Time interval n.2: [122.52, 122.72]  
 \* y\_true: [ 5.61571017 11.00089954]  
 \* v\_ann: [11.316680908203125, 8.918747901916504, 2  
 7.527697849634308]

---

\* err= 1.3927654253718156  
 \* Learning rate NN = 0.0029524494893848896  
 \* diff = 0.0003702821399445

*df n. 10 – Scene n. 3, at it = 350*



For scene 3/22

\* use LR\_NN=0.005 with err=5.1367727205930445 at it=19

```
* vθ_scn_mean = 27.739591538088593
* MAE = 1.1440184213436628
```

---



---

```
- Time interval n.0: [194.52, 194.72]
  * y_true: [18.69097642 14.73135237]
  * v_ann: [21.067031860351562, 20.59285545349121, 1
5.38515226818578]
```

---

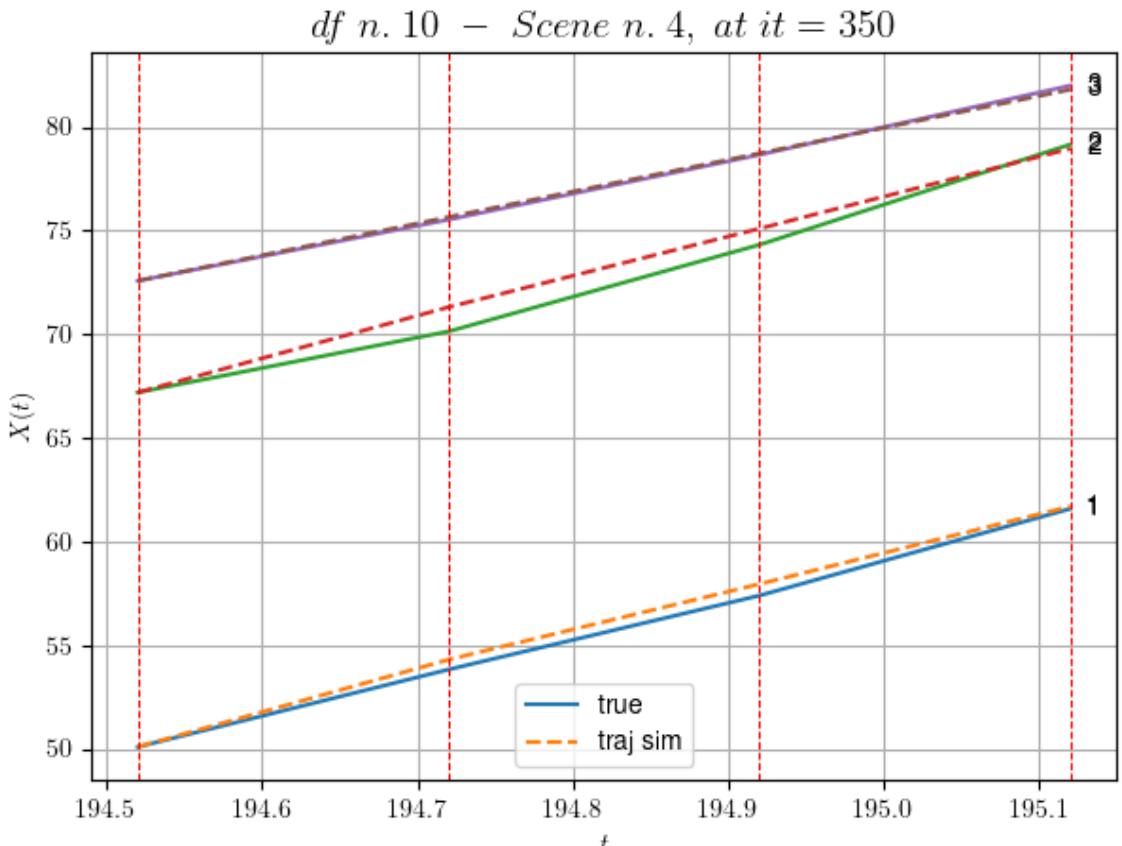
```
- Time interval n.1: [194.72, 194.92]
  * y_true: [17.84107996 20.91213867]
  * v_ann: [18.241106033325195, 18.946327209472656, 1
5.38515226818578]
```

---

```
- Time interval n.2: [194.92, 195.12]
  * y_true: [20.95142105 24.20273885]
  * v_ann: [18.74641990661621, 19.29642677307129, 15.
38515226818578]
```

---

```
* err= 0.21894479170810166
* Learning rate NN = 0.0005904899444431067
* diff = 1 13355000760003328.06
```



For scene 4/22

\* use LR\_NN=0.001 with err=15.320367415634118 at it=19

```
* vθ_scn_mean = 16.637747543255045
* MAE = 0.2132376947458733
```

```
=====
=====

- Time interval n.0: [201.52, 201.72]
  * y_true: [45.67726396 25.9301702 ]
  * v_ann: [29.23593521118164, 29.55716323852539, 25.
797453724579626]

-----
-----

- Time interval n.1: [201.72, 201.92]
  * y_true: [22.15536429 29.26032799]
  * v_ann: [30.189414978027344, 32.12129211425781, 2
5.797453724579626]

-----
-----

- Time interval n.2: [201.92, 202.12]
  * y_true: [30.43022185 23.25036083]
  * v_ann: [29.343528747558594, 29.937803268432617, 2
5.797453724579626]

-----
-----

- Time interval n.3: [202.12, 202.32]
  * y_true: [33.22042439 22.87050849]
  * v_ann: [28.841222763061523, 28.847240447998047, 2
5.797453724579626]

-----
-----

- Time interval n.4: [202.32, 202.52]
  * y_true: [33.45065979 24.47068757]
  * v_ann: [28.740989685058594, 28.55712127685547, 2
5.797453724579626]

-----
-----

- Time interval n.5: [202.52, 202.72]
  * y_true: [28.37081651 28.03104175]
  * v_ann: [28.79140853881836, 28.672199249267578, 2
5.797453724579626]

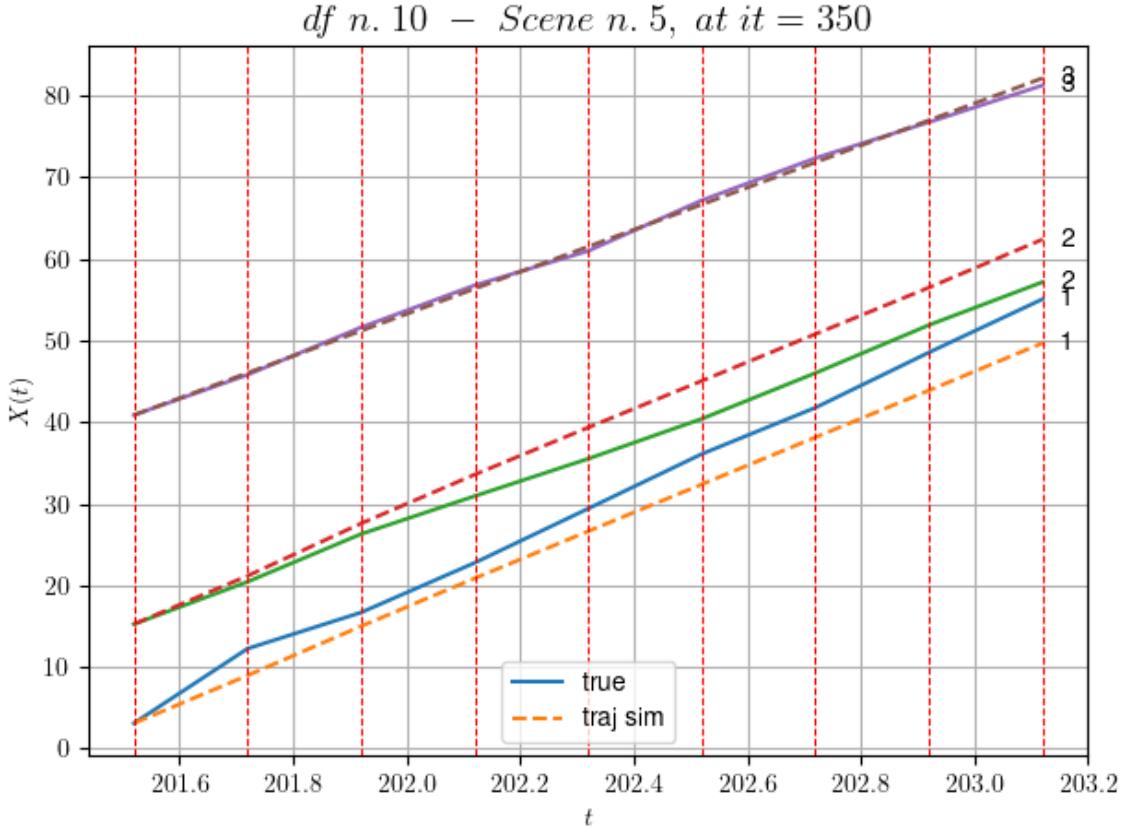
-----
-----

- Time interval n.6: [202.72, 202.92]
  * y_true: [33.85129081 29.41136895]
  * v_ann: [28.742420196533203, 28.504295349121094, 2
5.797453724579626]

-----
-----

- Time interval n.7: [202.92, 203.12]
  * y_true: [32.65166271 26.3315156 ]
  * v_ann: [29.0145263671875, 29.51921844482422, 25.7
97453724579626]
```

\* err= 8.198553081378854  
 \* Learning rate NN = 0.00010294552339473739



For scene 5/22

\* use LR\_NN=0.0005 with err=152.5456942674321 at it=19  
 \* v0\_scn\_mean = 26.157641507884087  
 \* MAE = 8.198553081378854

---



---

- Time interval n.0: [210.12, 210.32]  
 \* y\_true: [23.65050773 21.02104774]  
 \* v\_ann: [23.673540115356445, 24.344890594482422, 2  
 4.38294001142724]

---



---

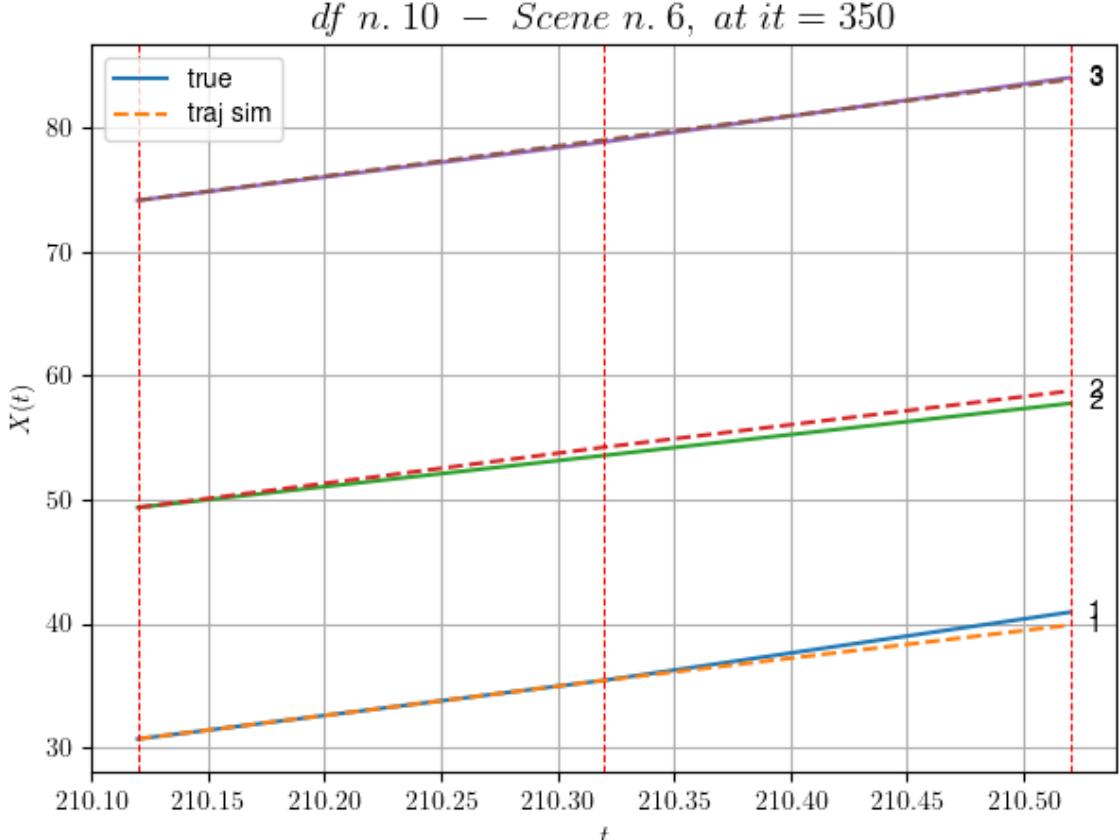
- Time interval n.1: [210.32, 210.52]  
 \* y\_true: [27.53081175 21.02121012]  
 \* v\_ann: [22.301536560058594, 22.69712257385254, 2  
 4.38294001142724]

---



---

\* err= 0.28665088766252755  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.0005640452313959154



For scene 6/22

- \* use LR\_NN=0.0005 with err=2.0088056868478428 at it=19
- \* v0\_scn\_mean = 24.86436157192358
- \* MAE = 0.28665088766252755

---



---

- Time interval n.0: [236.52, 236.72]
  - \* y\_true: [22.75077388 14.36119092]
  - \* v\_ann: [24.90932846069336, 22.719388961791992, 24.944297288056802]

---



---

- Time interval n.1: [236.72, 236.92]
  - \* y\_true: [21.51093715 22.77208028]
  - \* v\_ann: [18.855642318725586, 20.061195373535156, 24.944297288056802]

---



---

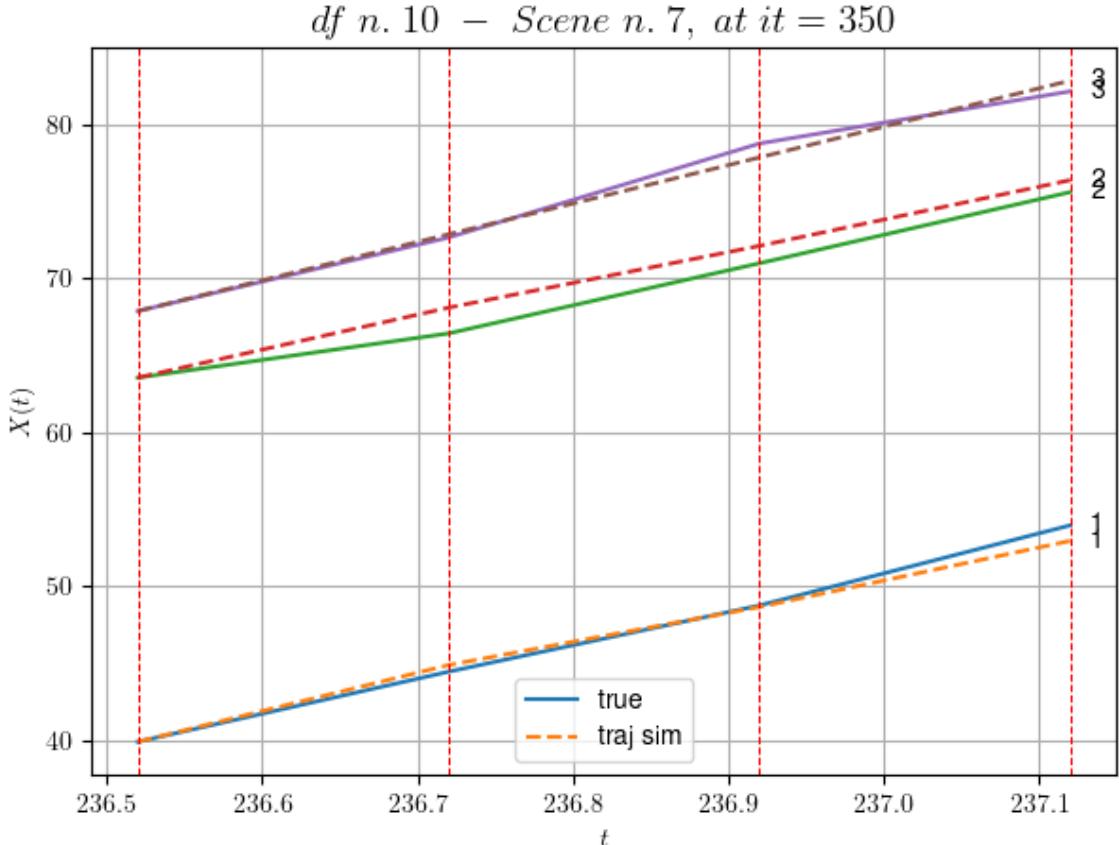
- Time interval n.2: [236.92, 237.12]
  - \* y\_true: [26.0213192 23.10241688]
  - \* v\_ann: [21.478845596313477, 21.355295181274414, 24.944297288056802]

---



---

- \* err= 0.6027635344834185
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 8.367427722699716e-05



For scene 7/22

```
* use LR_NN=0.001 with err=7.92263699517038 at it=19
* v0_scn_mean = 25.37760658045195
* MAE = 0.5857744864484187
```

---



---

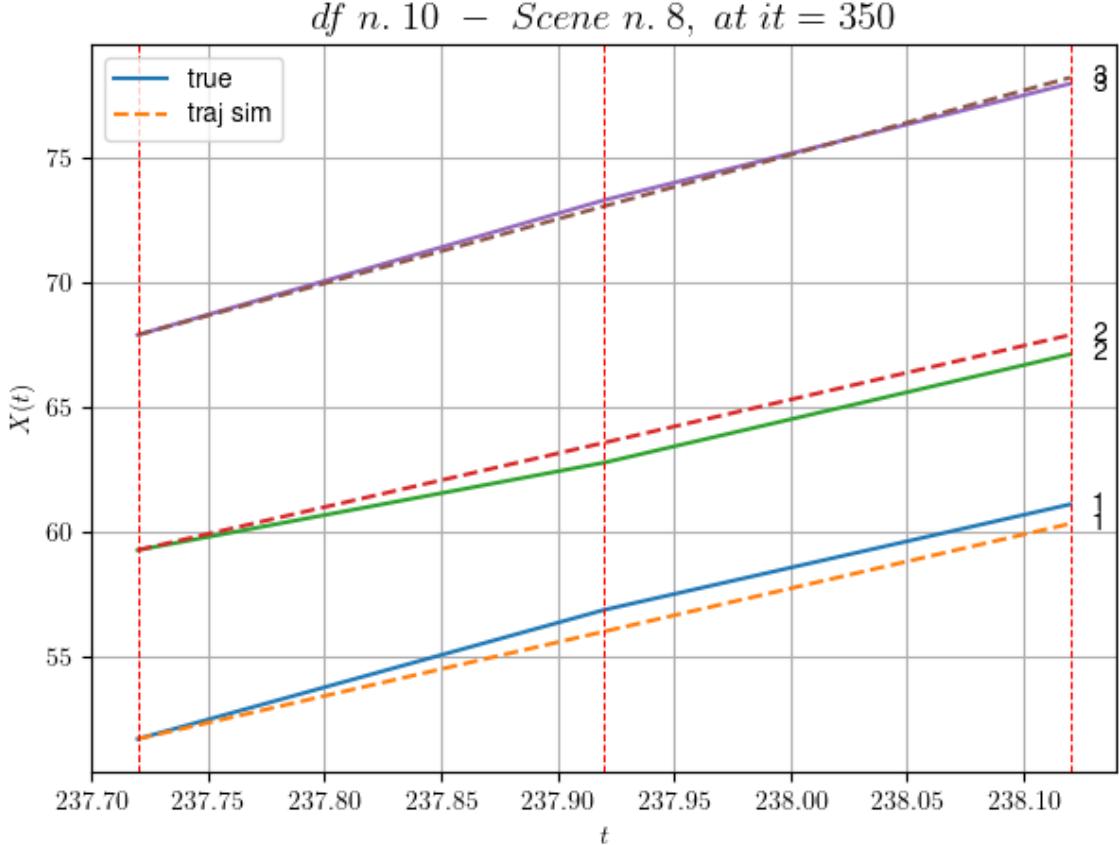
```
- Time interval n.0: [237.72, 237.92]
  * y_true: [25.90146221 17.55123599]
  * v_ann: [21.561717987060547, 21.55451774597168, 2
5.832622552460464]
```

---

```
- Time interval n.1: [237.92, 238.12]
  * y_true: [21.20141323 21.76181979]
  * v_ann: [21.65668296813965, 21.64230728149414, 25.
832622552460464]
```

---

```
* err= 0.3022635882979648
* Learning rate NN = 0.0007289999630302191
* diff = 1.1010287688850706e-05
```



For scene 8/22

- \* use LR\_NN=0.001 with err=1.8836901661641026 at it=19
- \* v0\_scn\_mean = 26.189796119781054
- \* MAE = 0.3022635882979648

---



---

- Time interval n.0: [317.32, 317.52]
  - \* y\_true: [14.46061508 5.00523108]
  - \* v\_ann: [9.809418678283691, 9.615514755249023, 5.959565079937927]
  
- Time interval n.1: [317.52, 317.72]
  - \* y\_true: [10.48047894 8.66542797]
  - \* v\_ann: [9.838141441345215, 9.658581733703613, 5.959565079937927]
  
- Time interval n.2: [317.72, 317.92]
  - \* y\_true: [ 5.95030099 13.38070893]
  - \* v\_ann: [9.695646286010742, 9.531835556030273, 5.959565079937927]
  
- Time interval n.3: [317.92, 318.12]
  - \* y\_true: [ 6.50033899 15.86094106]
  - \* v\_ann: [9.760619163513184, 9.616434097290039, 5.959565079937927]

59565079937927]

---

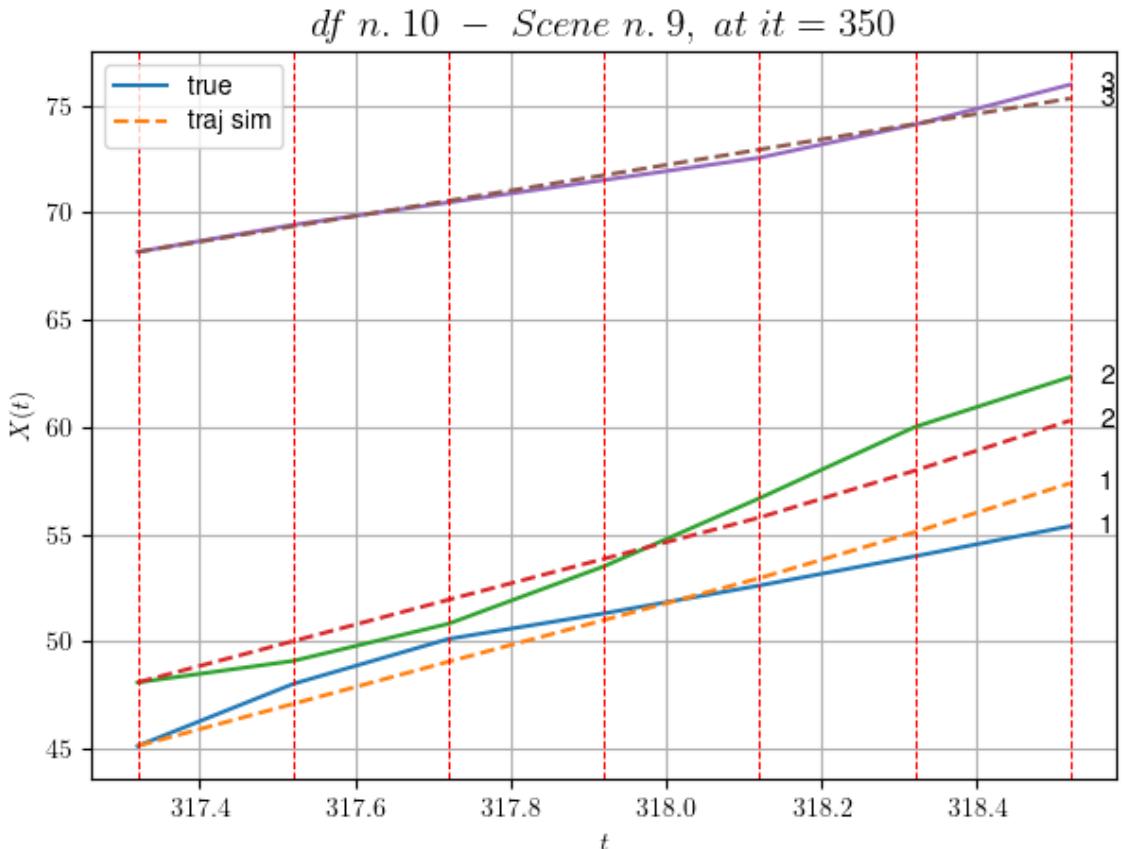
- Time interval n.4: [318.12, 318.32]
  - \* y\_true: [ 6.81537877 16.61109559]
  - \* v\_ann: [10.728671073913574, 10.930851936340332, 5.959565079937927]

---

- Time interval n.5: [318.32, 318.52]
  - \* y\_true: [ 7.02540529 11.65083477]
  - \* v\_ann: [11.398850440979004, 11.674874305725098, 5.959565079937927]

---

- \* err= 0.9229309262065599
- \* Learning rate NN = 0.0015690524596720934
- \* diff = 2.1652904885538504e-05



For scene 9/22

- \* use LR\_NN=0.005 with err=106.68514272825428 at it=19
- \* v0\_scn\_mean = 8.01999949184934
- \* MAE = 0.9206618152615434

---



---

- Time interval n.0: [321.12, 321.32]
  - \* y\_true: [25.50087189 14.95118626]
  - \* v\_ann: [19.39165496826172, 17.844362258911133, 2]

5.32846239154247]

```
- Time interval n.1: [321.32, 321.52]
  * y_true: [23.87107171 3.25027229]
  * v_ann: [19.134971618652344, 18.277585983276367, 2
```

5.32846239154247]

```
- Time interval n.2: [321.52, 321.72]
  * y_true: [25.04128771 23.00208642]
  * v_ann: [18.086528778076172, 18.74484634399414, 2
```

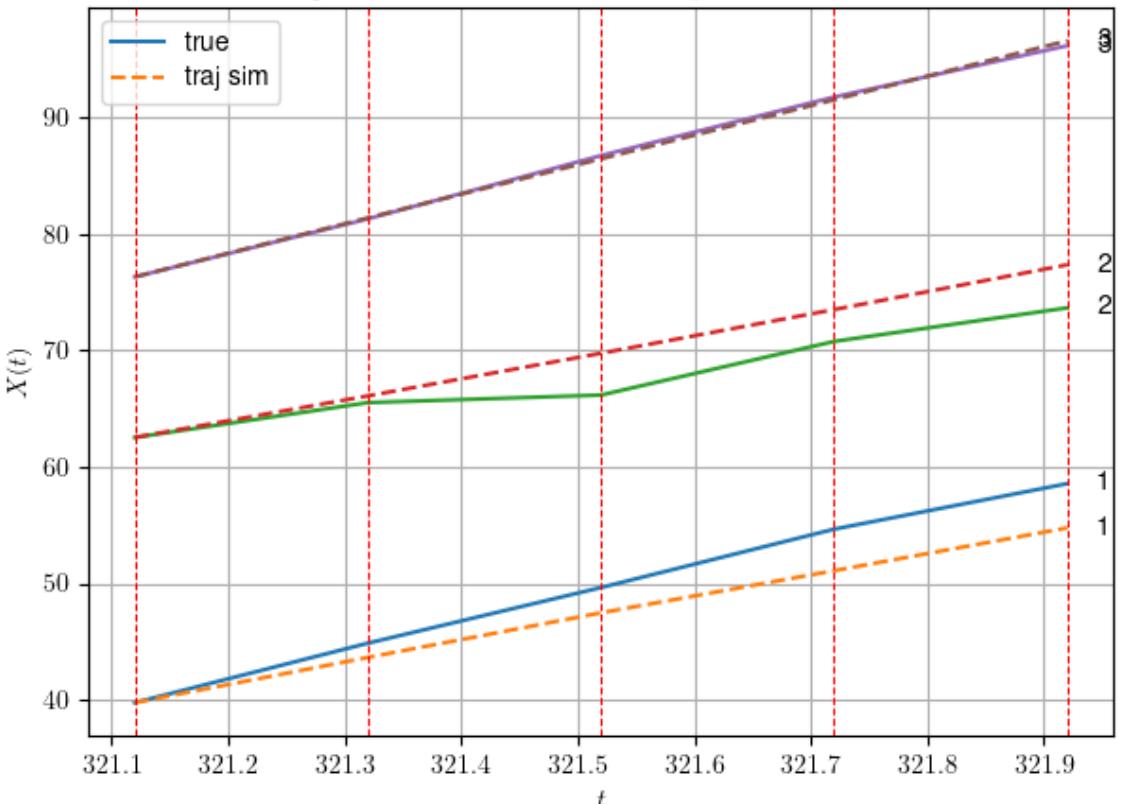
5.32846239154247]

```
- Time interval n.3: [321.72, 321.92]
  * y_true: [19.5212431 14.40145141]
  * v_ann: [18.363075256347656, 19.22328758239746, 2
```

5.32846239154247]

```
* err= 4.525974500852363
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.0033422681320152137
```

*df n. 10 – Scene n. 10, at it = 350*



For scene 10/22

```
* use LR_NN=0.0001 with err=4.668303755005435 at it=19
* v0_scn_mean = 25.728846031731337
* MAE = 4.3844135026258915
```

```
=====
=====

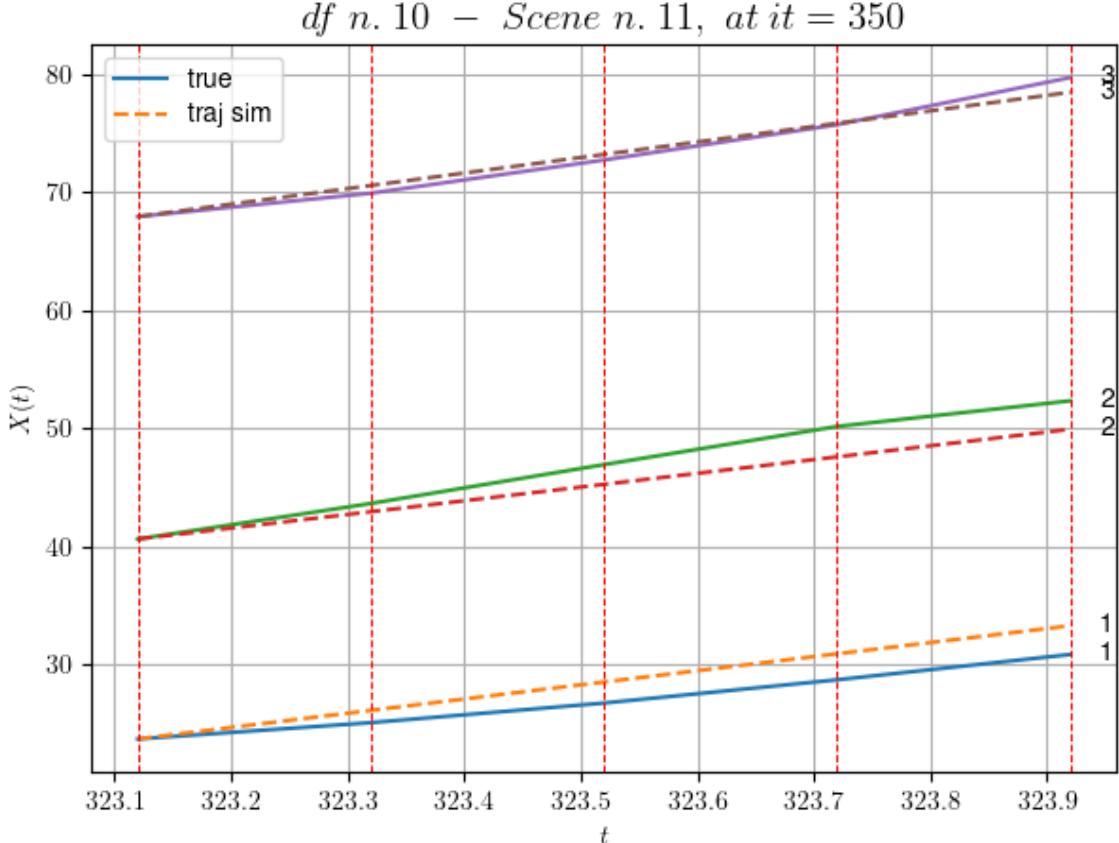
    - Time interval n.0: [323.12, 323.32]
      * y_true: [ 6.90008114 15.05052158]
      * v_ann: [12.110493659973145, 11.562156677246094, 1
3.161438821254912]

-----
    - Time interval n.1: [323.32, 323.52]
      * y_true: [ 8.30010994 16.45065772]
      * v_ann: [12.003683090209961, 11.59045124053955, 1
3.161438821254912]

-----
    - Time interval n.2: [323.52, 323.72]
      * y_true: [ 9.85014911 16.15074097]
      * v_ann: [11.932500839233398, 11.635563850402832, 1
3.161438821254912]

-----
    - Time interval n.3: [323.72, 323.92]
      * y_true: [10.7001865 10.85055419]
      * v_ann: [11.900814056396484, 11.688241958618164, 1
3.161438821254912]

-----
* err= 2.1957847583624517
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.0014158955886700575
```



For scene 11/22

- \* use LR\_NN=5e-05 with err=21.85020448361143 at it=19
- \* v0\_scn\_mean = 14.604621983919492
- \* MAE = 2.1957847583624517

---



---

- Time interval n.0: [337.72, 337.92]
- \* y\_true: [11.69035174 22.47147634]
- \* v\_ann: [13.266243934631348, 13.573012351989746, 1  
6.738540275581723]

---



---

- Time interval n.1: [337.92, 338.12]
- \* y\_true: [10.20034007 18.27135214]
- \* v\_ann: [14.129831314086914, 14.618027687072754, 1  
6.738540275581723]

---



---

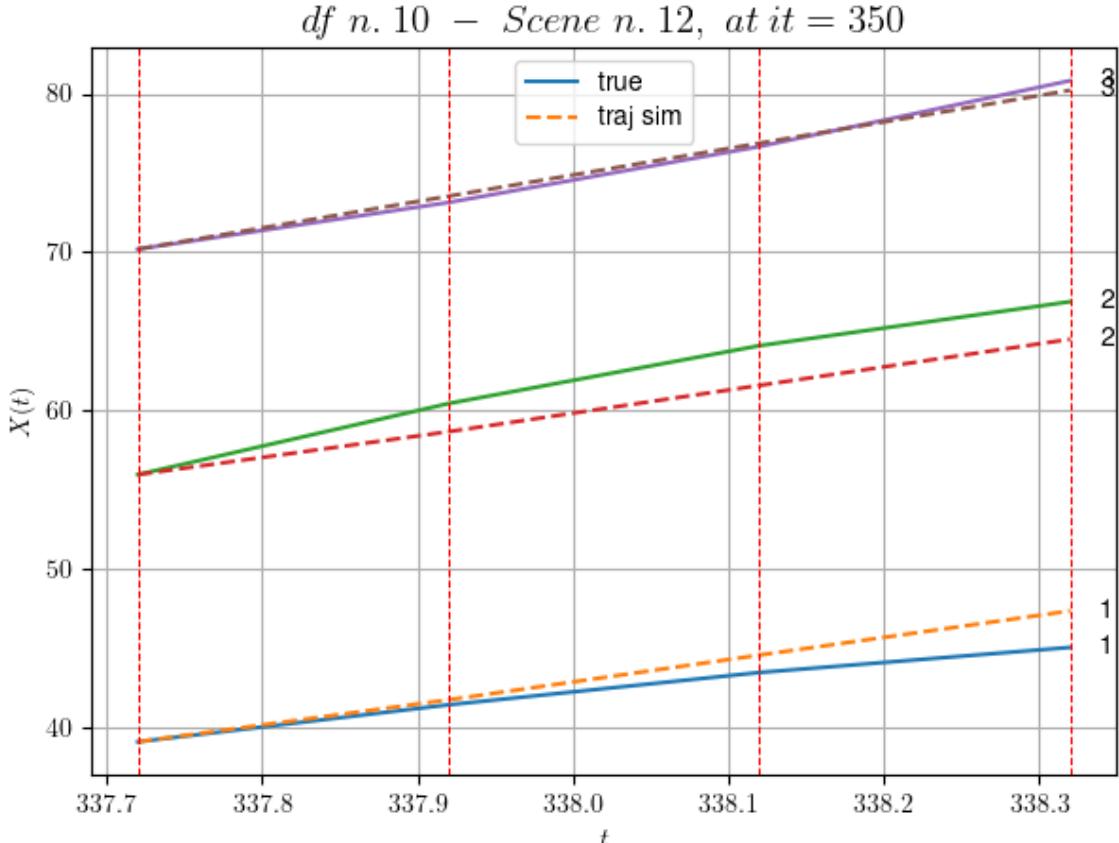
- Time interval n.2: [338.12, 338.32]
- \* y\_true: [ 7.94029275 13.91116184]
- \* v\_ann: [13.970025062561035, 14.599884033203125, 1  
6.738540275581723]

---



---

- \* err= 1.8587199320895904
- \* Learning rate NN = 0.0002952449722215533
- \* diff = 0.0009247809620882563



For scene 12/22

```
* use LR_NN=0.0005 with err=12.23479920623727 at it=19
* v0_scn_mean = 17.87514067649877
* MAE = 1.8587199320895904
```

---



---

```
- Time interval n.0: [369.32, 369.52]
  * y_true: [22.34117259 11.42097363]
  * v_ann: [16.36141014099121, 16.447423934936523, 2
0.508930553904207]
```

---

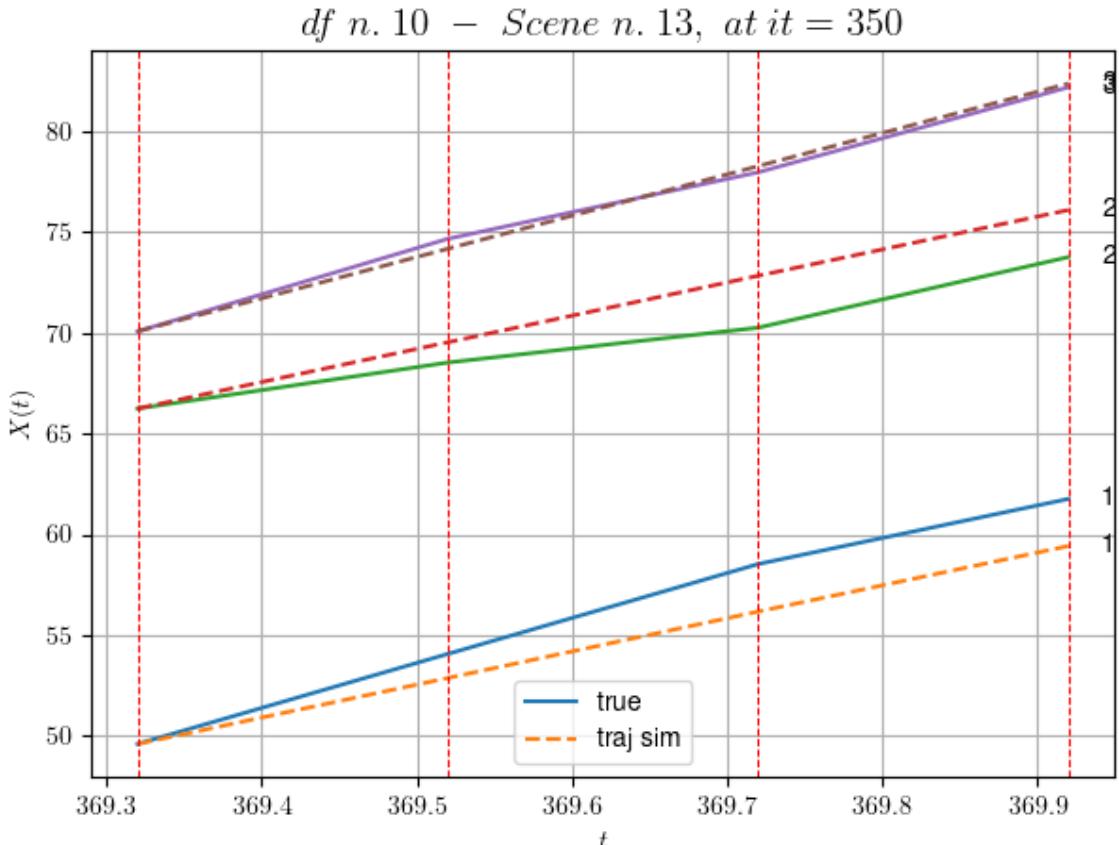
```
- Time interval n.1: [369.52, 369.72]
  * y_true: [22.31135956 8.65079743]
  * v_ann: [16.49247932434082, 16.512317657470703, 2
0.508930553904207]
```

---

```
- Time interval n.2: [369.72, 369.92]
  * y_true: [16.17115552 17.53172003]
  * v_ann: [16.280193328857422, 16.32510757446289, 2
0.508930553904207]
```

---

```
* err= 2.1623897796526896
* Learning rate NN = 0.0002952449722215533
* diff = 7.844212460295097e-05
```



For scene 13/22

```
* use LR_NN=0.0005 with err=5.4500372067711025 at it=19
* v0_scn_mean = 21.322381980952652
* MAE = 2.16226488816025
```

---



---

- Time interval n.0: [370.92, 371.12]
  - \* y\_true: [12.30016813 11.70074461]
  - \* v\_ann: [9.9723539352417, 9.75079345703125, 19.892193491628227]
  
- Time interval n.1: [371.12, 371.32]
  - \* y\_true: [ 9.3501493 10.70073785]
  - \* v\_ann: [10.575724601745605, 10.60250473022461, 19.892193491628227]
  
- Time interval n.2: [371.32, 371.52]
  - \* y\_true: [ 8.90016062 10.12074395]
  - \* v\_ann: [10.400368690490723, 10.520209312438965, 19.892193491628227]
  
- Time interval n.3: [371.52, 371.72]
  - \* y\_true: [8.30016702 9.00070559]
  - \* v\_ann: [10.104307174682617, 10.372501373291016, 19.892193491628227]

9.892193491628227]

---

- Time interval n.4: [371.72, 371.92]
  - \* y\_true: [15.35035581 9.32077268]
  - \* v\_ann: [9.614047050476074, 10.104360580444336, 1]

9.892193491628227]

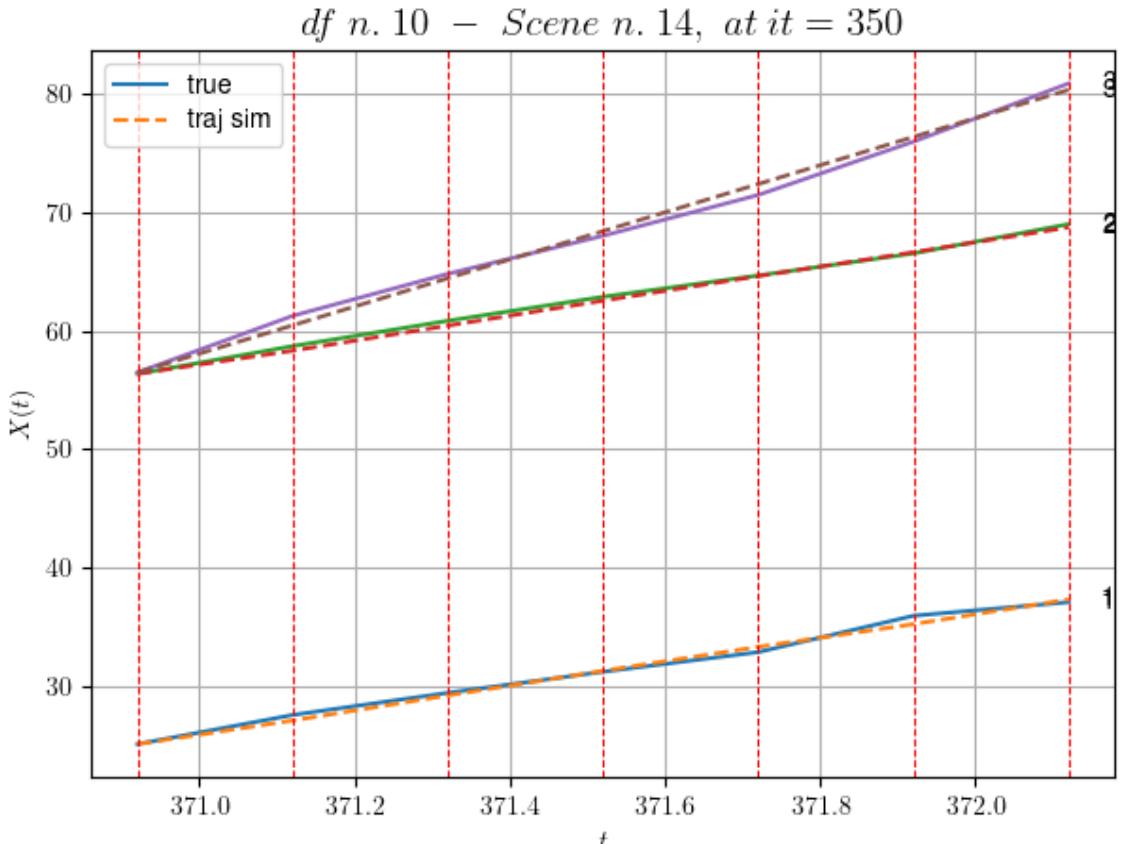
---

- Time interval n.5: [371.92, 372.12]
  - \* y\_true: [ 5.75014975 12.37110708]
  - \* v\_ann: [10.459443092346191, 10.503028869628906, 1]

9.892193491628227]

---

- \* err= 0.1799890176155781
- \* Learning rate NN = 0.00031381050939671695
- \* diff = 0.00017323499409277465



For scene 14/22

- \* use LR\_NN=0.001 with err=29.081986581844017 at it=19
- \* v0\_scn\_mean = 20.758503624037996
- \* MAE = 0.1799890176155781

---



---

For scene 15/22

- \* use LR\_NN=0.0001 with err=16.234259846154504 at it=19
- \* v0\_scn\_mean = 15.675358364294338

\* MAE = 0.11611997317821969

---



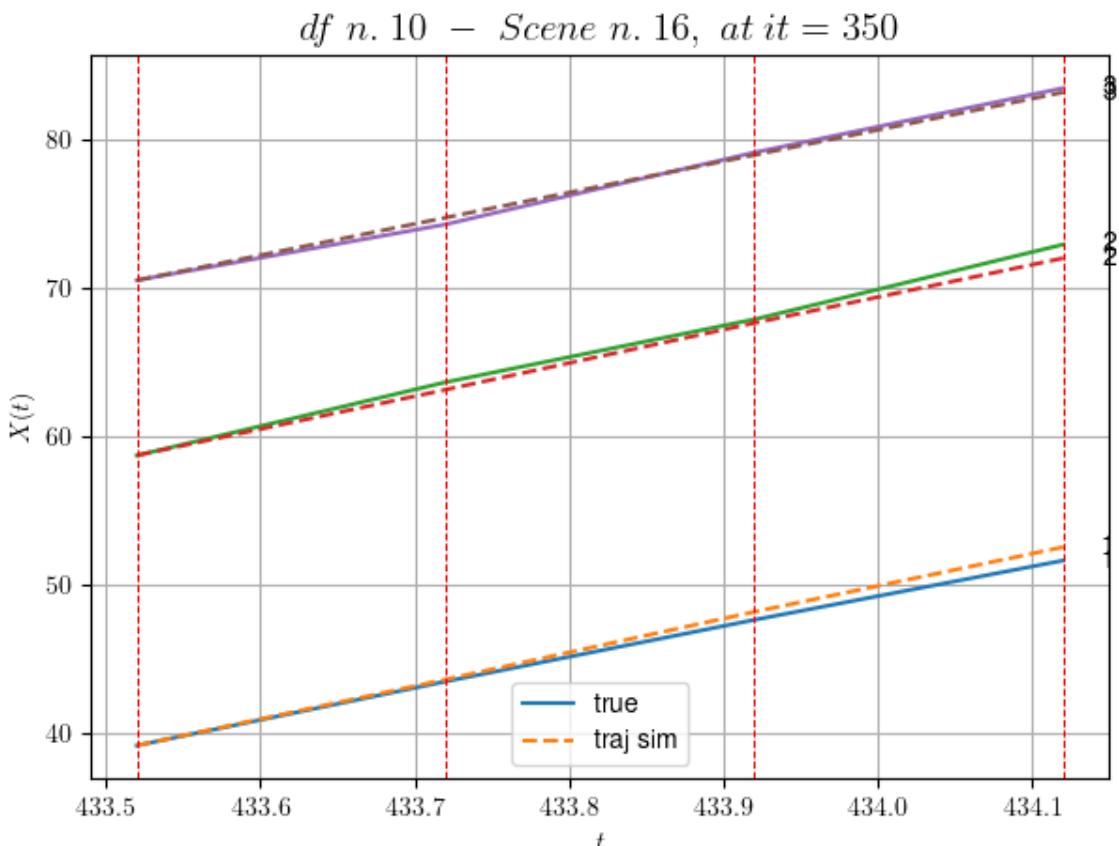
---

```
- Time interval n.0: [433.52, 433.72]
* y_true: [21.56070162 24.64178312]
* v_ann: [22.236427307128906, 22.129005432128906, 2
1.09574286493239]

-----
- Time interval n.1: [433.72, 433.92]
* y_true: [20.75082718 21.171764 ]
* v_ann: [22.777996063232422, 22.444435119628906, 2
1.09574286493239]

-----
- Time interval n.2: [433.92, 434.12]
* y_true: [19.97093958 25.19244807]
* v_ann: [21.79521369934082, 21.83180046081543, 21.
09574286493239]

-----
* err= 0.21734343847598003
* Learning rate NN = 0.0002952449722215533
* diff = 0.00015687851126042207
```



For scene 16/22

\* use LR\_NN=0.0005 with err=8.14409468260528 at it=19  
\* v0\_scn\_mean = 21.858900348338924

\* MAE = 0.21734343847598003

---



---

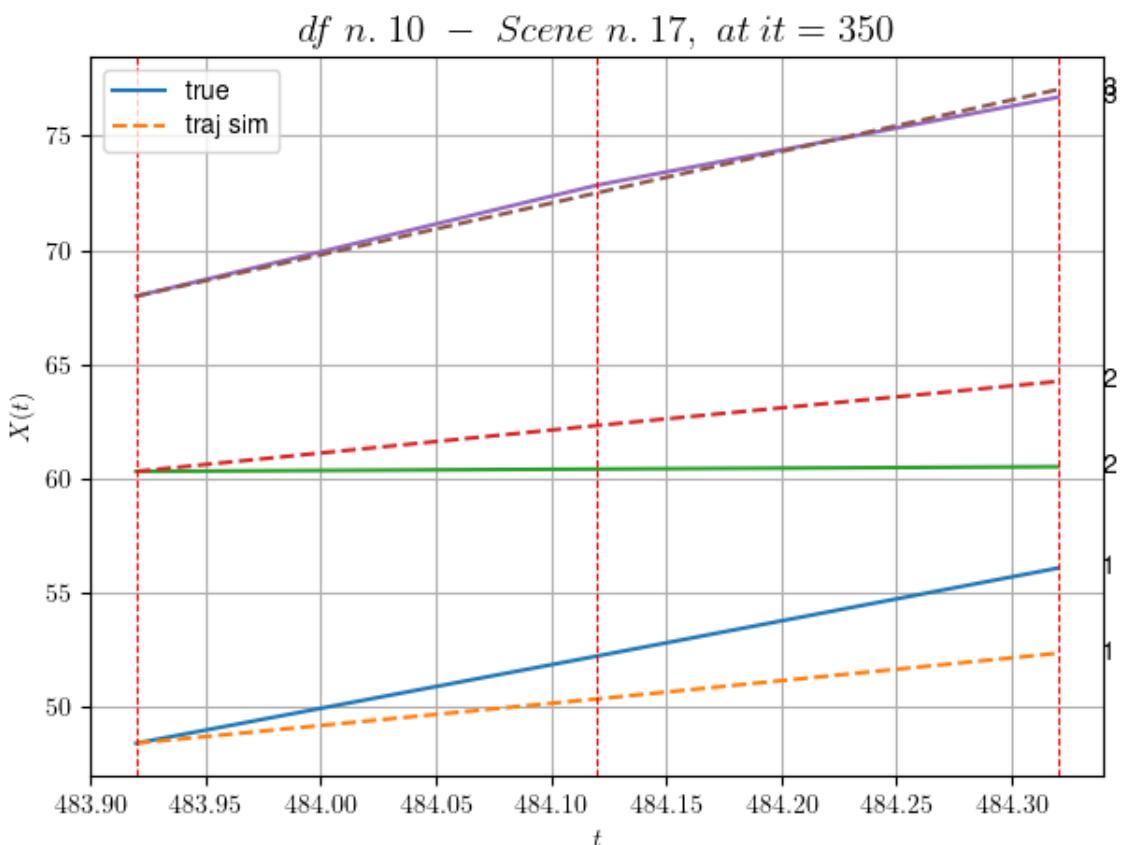
- Time interval n.0: [483.92, 484.12]  
 \* y\_true: [19.08092085 0.51217506]  
 \* v\_ann: [9.705316543579102, 10.048018455505371, 2  
 2.618970274116737]

---

- Time interval n.1: [484.12, 484.32]  
 \* y\_true: [19.26103904 0.51217506]  
 \* v\_ann: [9.994553565979004, 9.650653839111328, 22.  
 618970274116737]

---

\* err= 3.9144891257078336  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.0009283578283749705



For scene 17/22

\* use LR\_NN=0.0005 with err=4.912866433665331 at it=19  
 \* v0\_scn\_mean = 23.251576451713916  
 \* MAE = 3.9144891257078336

---



---

- Time interval n.0: [531.72, 531.92]

```

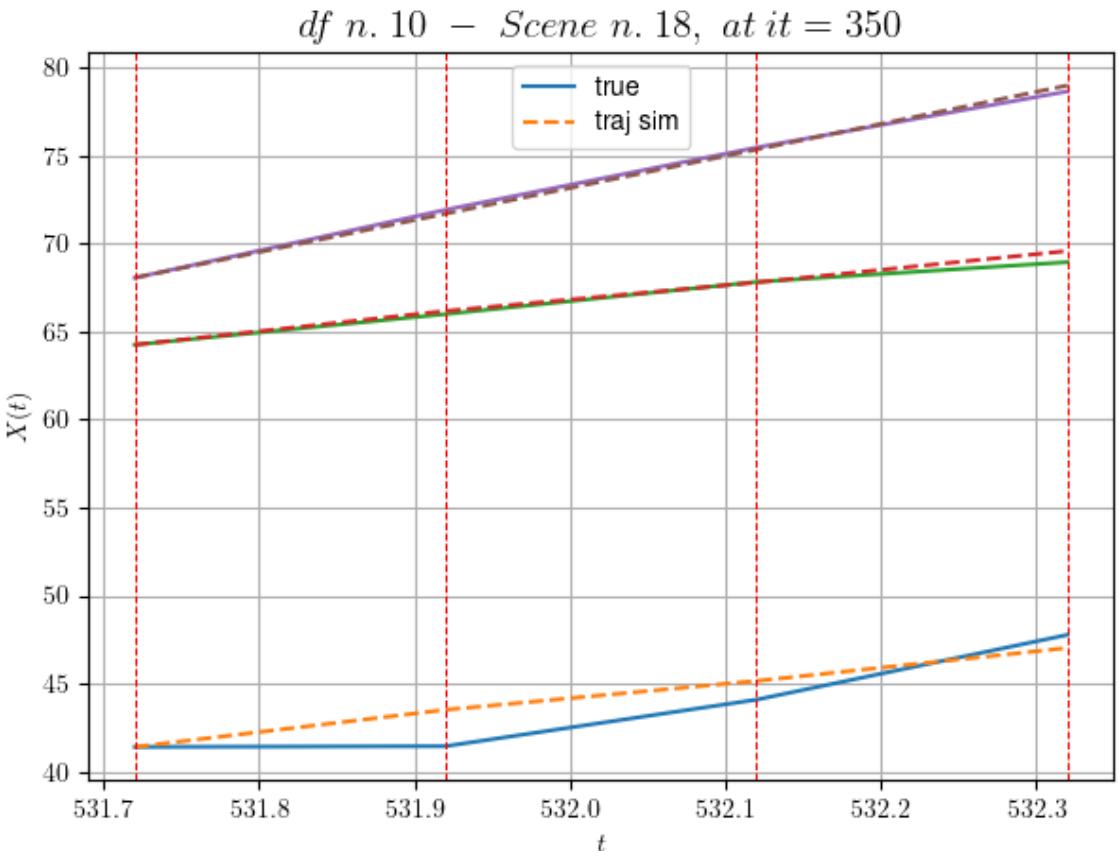
* y_true: [0.21693371 8.7044085 ]
* v_ann: [10.548367500305176, 9.584748268127441, 1
8.20525917578688]

-----
- Time interval n.1: [531.92, 532.12]
* y_true: [13.20333652 9.14775604]
* v_ann: [8.198003768920898, 8.101962089538574, 18.
20525917578688]

-----
- Time interval n.2: [532.12, 532.32]
* y_true: [18.40074328 5.60188997]
* v_ann: [9.359894752502441, 8.93921184539795, 18.2
0525917578688]

-----
* err= 0.5472998067572209
* Learning rate NN = 0.0005904899444431067
* diff = 1.5385762535236047e-05

```



For scene 18/22

```

* use LR_NN=0.001 with err=8.801138639475303 at it=19
* v0_scn_mean = 19.216151447685775
* MAE = 0.5372678757547599
=====
```

---



---



---

- Time interval n.0: [202.52, 202.72]

```

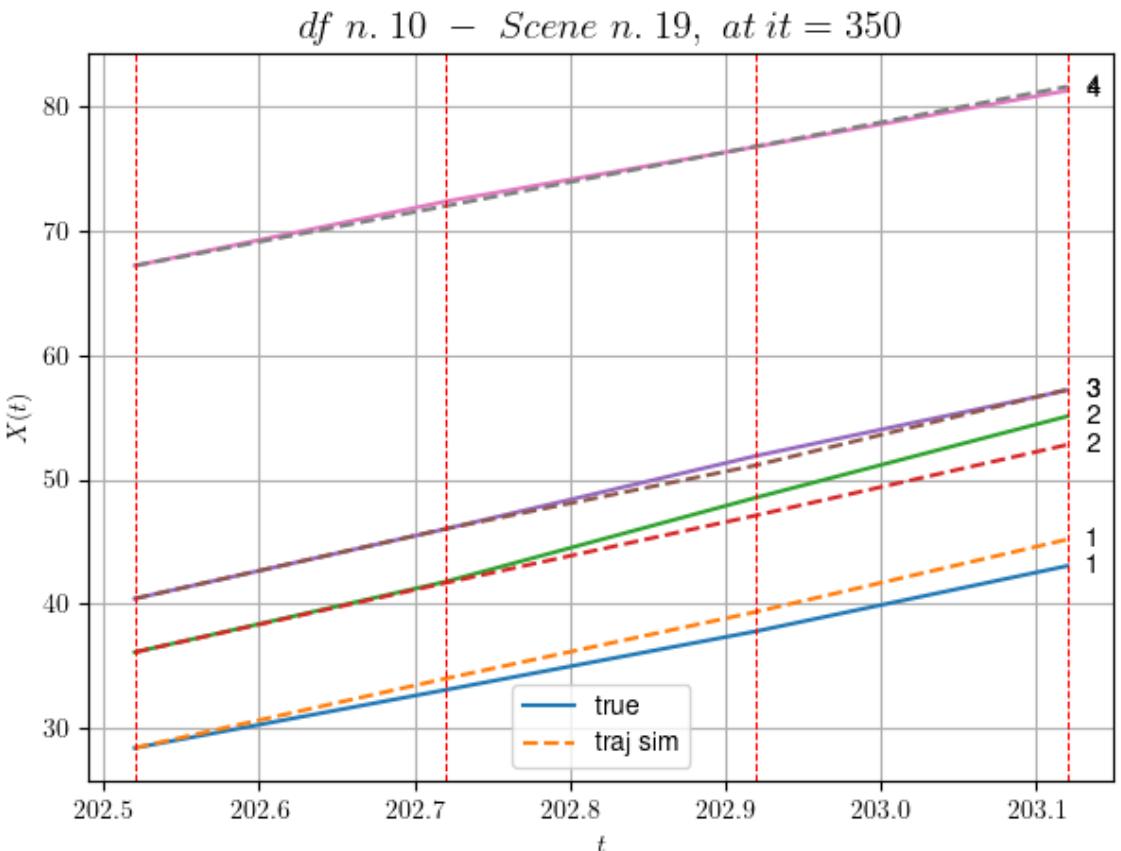
* y_true: [23.35318258 28.37081651 28.03104175]
* v_ann: [27.90244483947754, 27.869897842407227, 2
8.08558464050293, 24.014995625684968]

-----
- Time interval n.1: [202.72, 202.92]
* y_true: [23.6005682 33.85129081 29.41136895]
* v_ann: [26.86227798461914, 27.18238639831543, 25.
597200393676758, 24.014995625684968]

-----
- Time interval n.2: [202.92, 203.12]
* y_true: [26.25082225 32.65166271 26.3315156 ]
* v_ann: [29.073427200317383, 28.37678337097168, 3
0.40055274963379, 24.014995625684968]

-----
* err= 0.9942771725466553
* Learning rate NN = 0.0005904899444431067
* diff = 2.8917706371034413e-05

```



For scene 19/22

```

* use LR_NN=0.001 with err=21.56531011397908 at it=19
* v0_scn_mean = 24.698128173240814
* MAE = 0.9942771725466553

```

For scene 20/22

\* use LR\_NN=0.001 with err=8.062211491711215 at it=19

\* v0\_scn\_mean = 17.180414687098963

\* MAE = 0.5193366851964862

- Time interval n.0: [441.12, 441.32]

\* y\_true: [16.40031153 12.42055509 15.89074593]

\* v\_ann: [15.300905227661133, 15.180379867553711, 1  
5.401843070983887, 19.354115329350048]

- Time interval n.1: [441.32, 441.52]

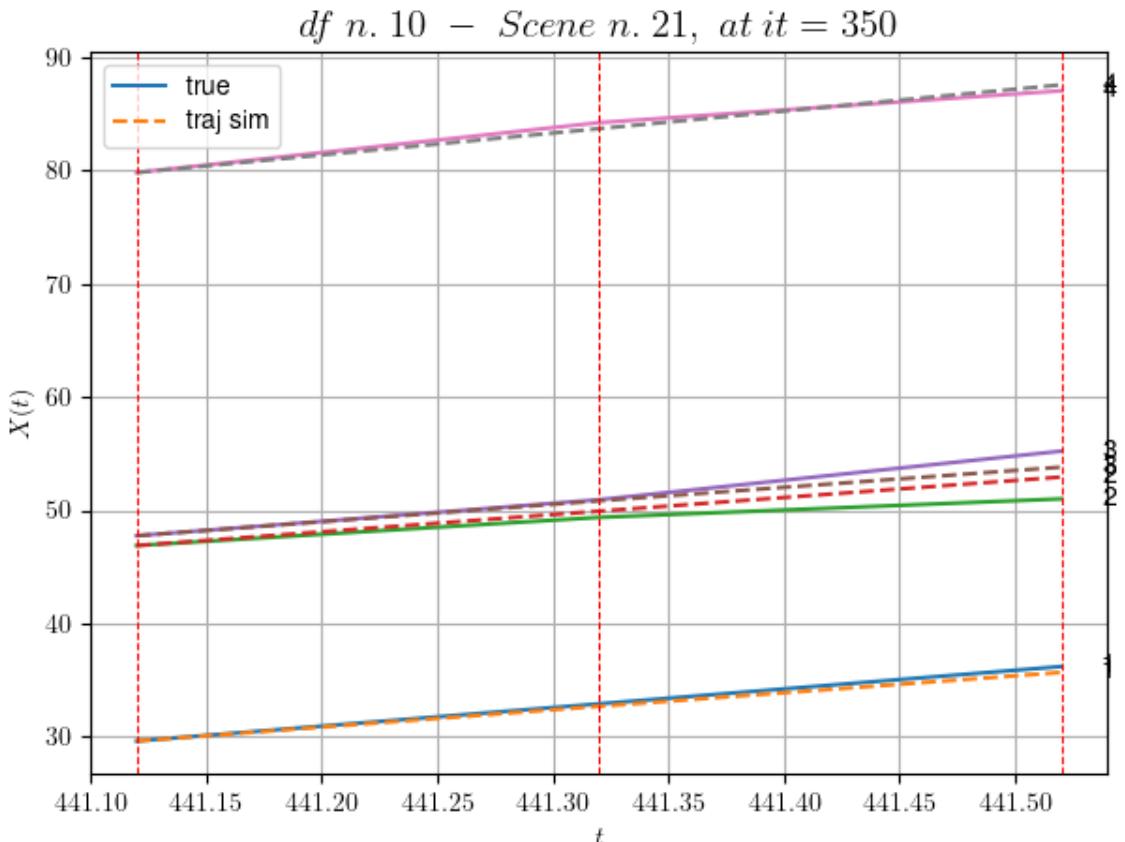
\* y\_true: [16.46038907 8.18039995 21.4511847 ]

\* v\_ann: [14.970864295959473, 15.055692672729492, 1  
4.874731063842773, 19.354115329350048]

\* err= 0.5752598624965262

\* Learning rate NN = 0.0007289999630302191

\* diff = 6.801051232296906e-06



For scene 21/22

\* use LR\_NN=0.001 with err=3.9536831216887474 at it=19

\* v0\_scn\_mean = 20.56924398443554

\* MAE = 0.5720839378097763

For df=10 with 22 scenes, time taken: 234.69

Time taken for the computation: 2218.02

Time taken using 1-4-1 NN structure: 2218.05

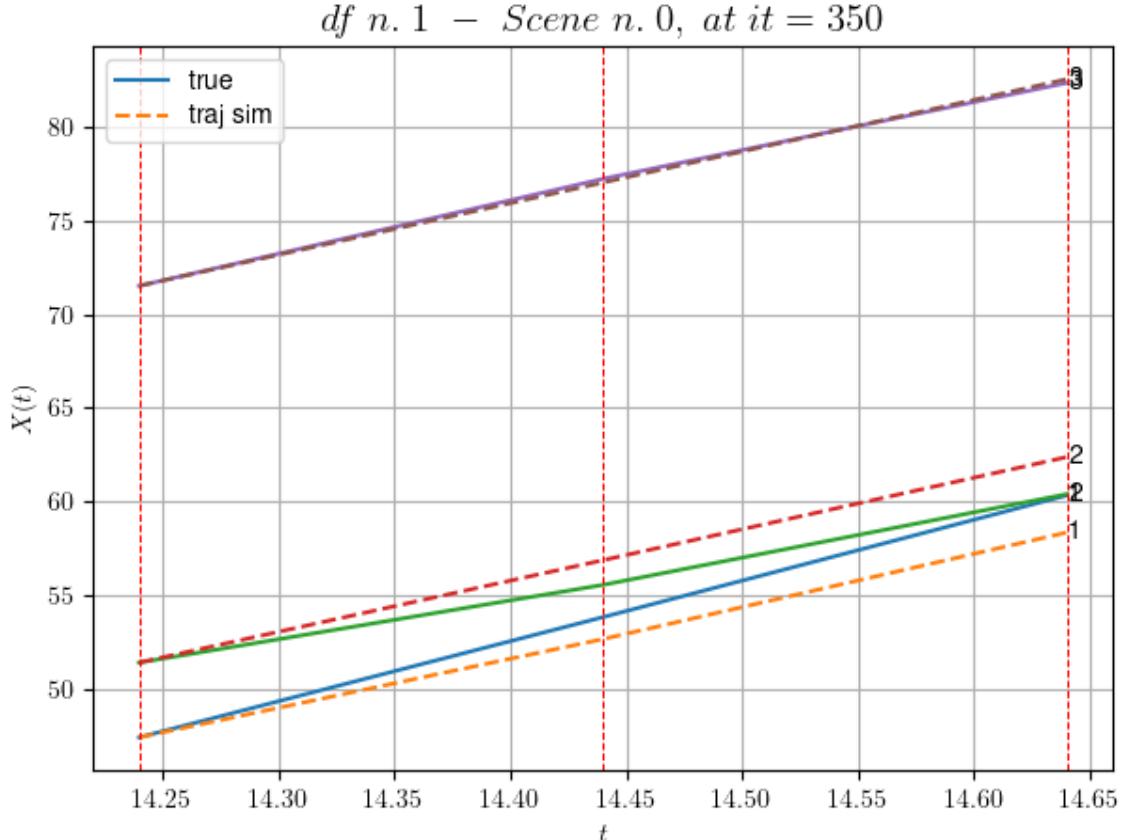
NN structure: 1-10-1

In df n.1/10 we have 28 scenes

- Time interval n.0: [14.24, 14.44]  
\* y\_true: [32.1443344 20.77111865]  
\* v\_ann: [26.27035140991211, 27.37550926208496, 27.  
63629536512854]

- Time interval n.1: [14.44, 14.64]  
\* y\_true: [32.5721373 24.27162308]  
\* v\_ann: [28.520448684692383, 27.590274810791016, 2  
7.63629536512854]

\* err= 1.2314390907632953  
\* Learning rate NN = 0.0007289999630302191  
\* diff = 0.0003760408523056924



For scene 0/28

```
* use LR_NN=0.001 with err=13.709255384544392 at it=19
* v0_scn_mean = 27.838881482454536
* MAE = 1.2314390907632953
```

---



---

- Time interval n.0: [23.64, 23.84]
  - \* y\_true: [26.6509107 26.65125804]
  - \* v\_ann: [25.995624542236328, 24.626861572265625, 3  
1.184412007415986]

---

- Time interval n.1: [23.84, 24.04]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [26.834075927734375, 26.329574584960938, 3  
1.184412007415986]

---

- Time interval n.2: [24.04, 24.24]
  - \* y\_true: [29.05143519 29.47691739]
  - \* v\_ann: [28.569355010986328, 29.123653411865234, 3  
1.184412007415986]

---

- Time interval n.3: [24.24, 24.44]
  - \* y\_true: [27.07699139 24.80226709]
  - \* v\_ann: [28.83160972595215, 30.293487548828125, 3  
1.184412007415986]

1.184412007415986]

---

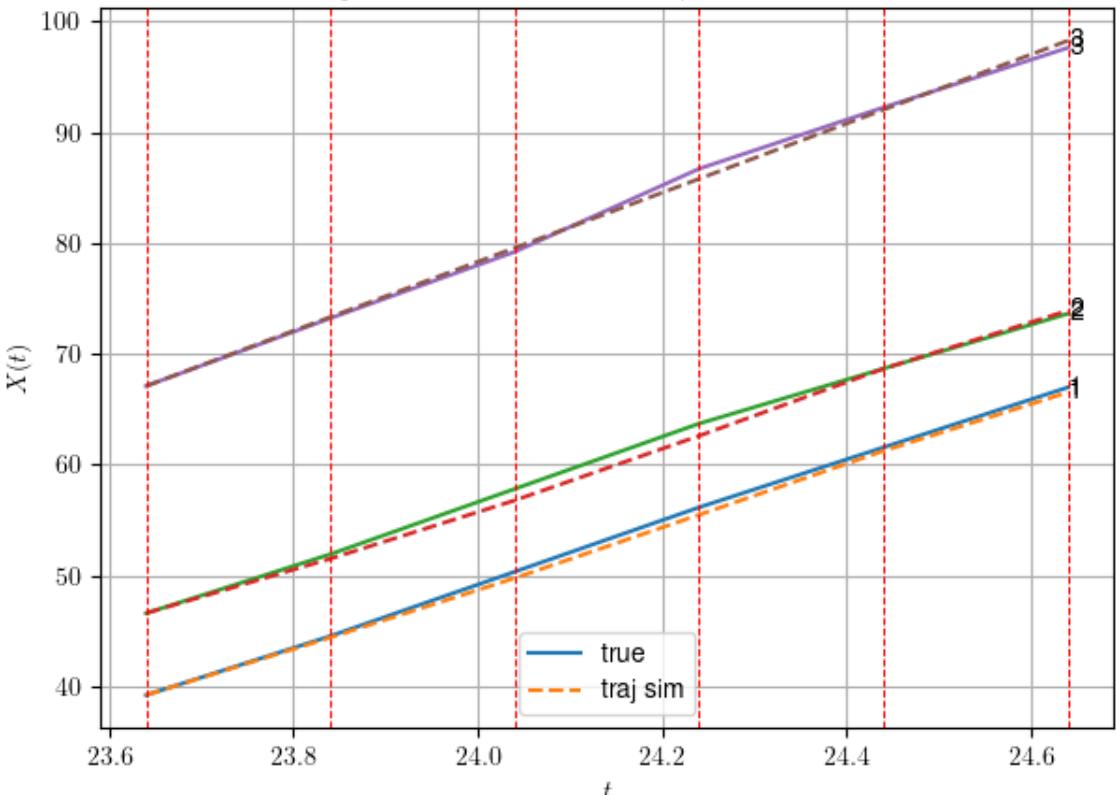
- Time interval n.4: [24.44, 24.64]
  - \* y\_true: [27.07699139 24.80226709]
  - \* v\_ann: [26.44155502319336, 26.231304168701172, 3]

1.184412007415986]

---

- \* err= 0.2808818532622391
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 0.00026788450414799714

*df n. 1 – Scene n. 1, at it = 350*



For scene 1/28

- \* use LR\_NN=0.001 with err=28.734543058406377 at it=19
- \* v0\_scn\_mean = 31.082899565312662
- \* MAE = 0.17185149484166187

8.250933212462616]

---

- Time interval n.0: [72.44, 72.64]
  - \* y\_true: [25.85001228 31.10049693]
  - \* v\_ann: [27.494430541992188, 28.749284744262695, 2]

---

- Time interval n.1: [72.64, 72.84]
  - \* y\_true: [30.00006309 33.82077482]
  - \* v\_ann: [27.49159812927246, 28.80107307434082, 28.]

250933212462616]

```

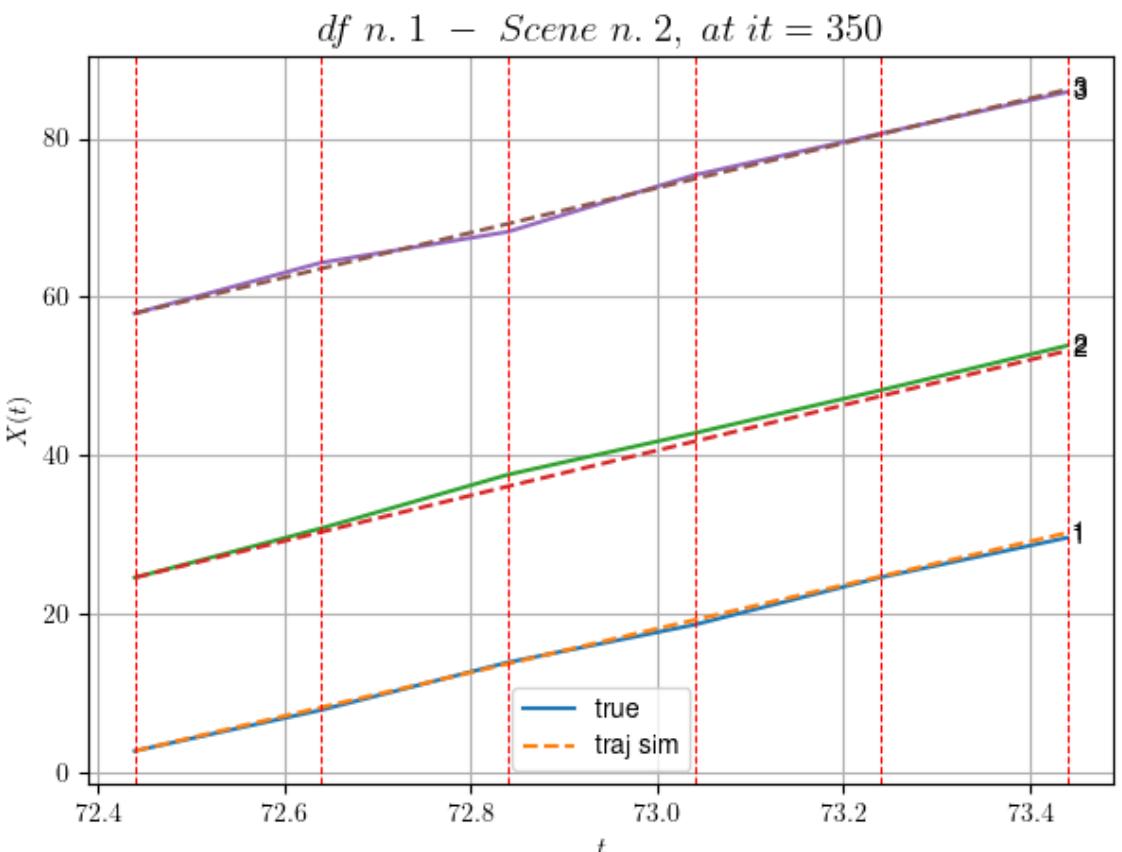
-----
- Time interval n.2: [72.84, 73.04]
  * y_true: [23.75011307 26.19081077]
  * v_ann: [27.619295120239258, 28.332996368408203, 2
8.250933212462616]

-----
- Time interval n.3: [73.04, 73.24]
  * y_true: [29.90025591 27.11111625]
  * v_ann: [27.534236907958984, 28.609683990478516, 2
8.250933212462616]

-----
- Time interval n.4: [73.24, 73.44]
  * y_true: [25.05033948 28.161422 ]
  * v_ann: [27.534454345703125, 28.5858154296875, 28.
250933212462616]

-----
* err= 0.4066251469815811
* Learning rate NN = 3.874203684972599e-06
* diff = 0.005596682693712829

```



For scene 2/28

```

* use LR_NN=1e-05 with err=3.3089013020107814 at it=19
* v0_scn_mean = 28.400840541916427
* MAE = 0.24800142902282538

```

```

=====
=====

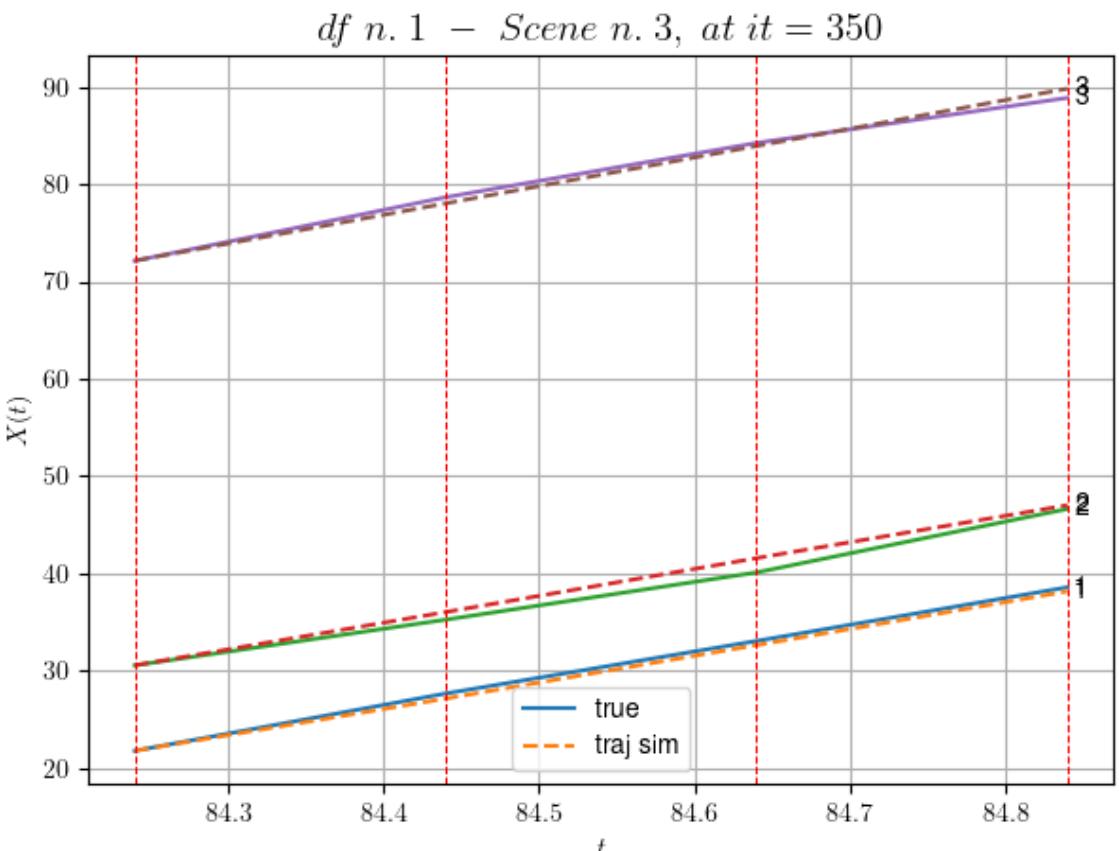
    - Time interval n.0: [84.24, 84.44]
      * y_true: [29.4403562 23.48047527]
      * v_ann: [26.839370727539062, 27.38765525817871, 2
9.49436924721108]

-----
    - Time interval n.1: [84.44, 84.64]
      * y_true: [27.01049004 24.28067739]
      * v_ann: [27.492685317993164, 27.7249813079834, 29.
49436924721108]

-----
    - Time interval n.2: [84.64, 84.84]
      * y_true: [27.60069732 32.65118399]
      * v_ann: [27.62258529663086, 27.206222534179688, 2
9.49436924721108]

-----
* err= 0.4113958192460605
* Learning rate NN = 5.904899080633186e-05
* diff = 1.2641309759697794e-05

```



For scene 3/28

\* use LR\_NN=0.0001 with err=24.143986239070824 at it=19  
 \* v0\_scn\_mean = 29.537705360148777  
 \* MAE = 0.4113958192460605

---



---

- Time interval n.0: [131.64, 131.84]
  - \* y\_true: [30.80073929 29.11067519]
  - \* v\_ann: [28.893375396728516, 28.889034271240234, 28.442903953642848]

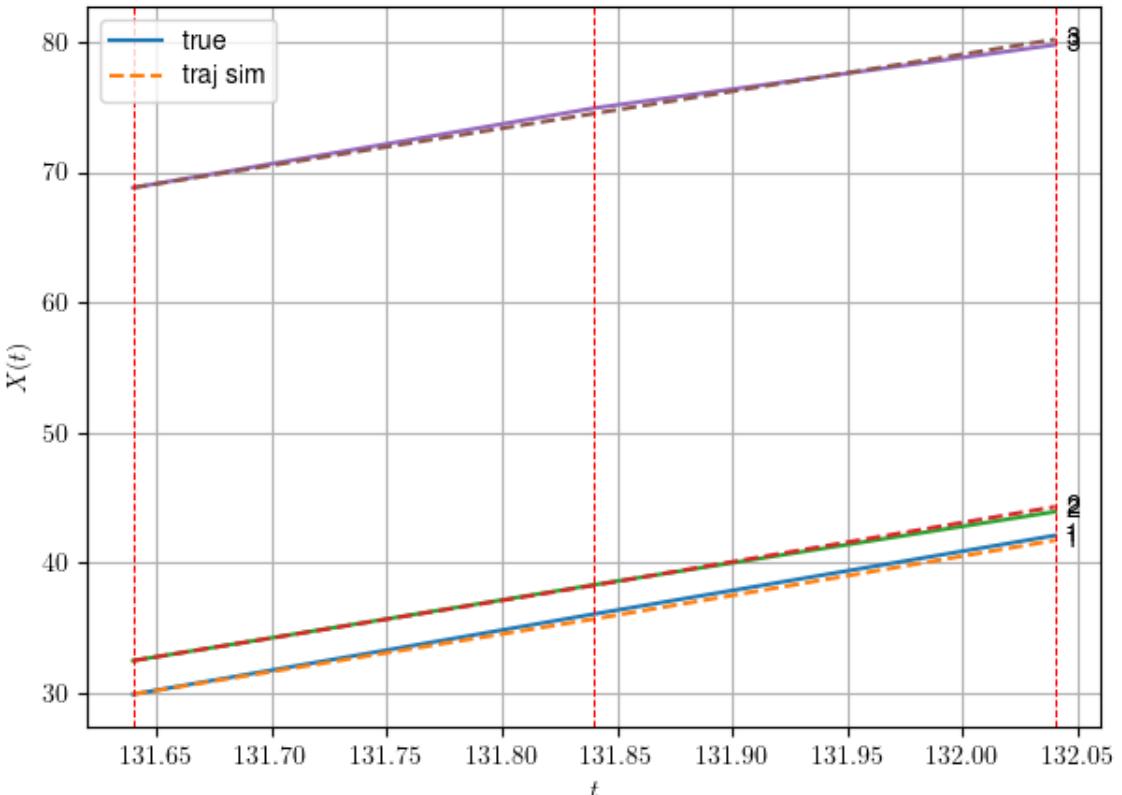
---

- Time interval n.1: [131.84, 132.04]
  - \* y\_true: [30.16079766 28.07097758]
  - \* v\_ann: [30.207155227661133, 30.165714263916016, 28.442903953642848]

---

- \* err= 0.08601965855195483
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 2.3483229555865126e-05

*df n. 1 – Scene n. 4, at it = 350*



For scene 4/28

- \* use LR\_NN=0.0005 with err=15.49045843254391 at it=19
- \* v0\_scn\_mean = 28.576358039945397
- \* MAE = 0.08540646553660808

---



---

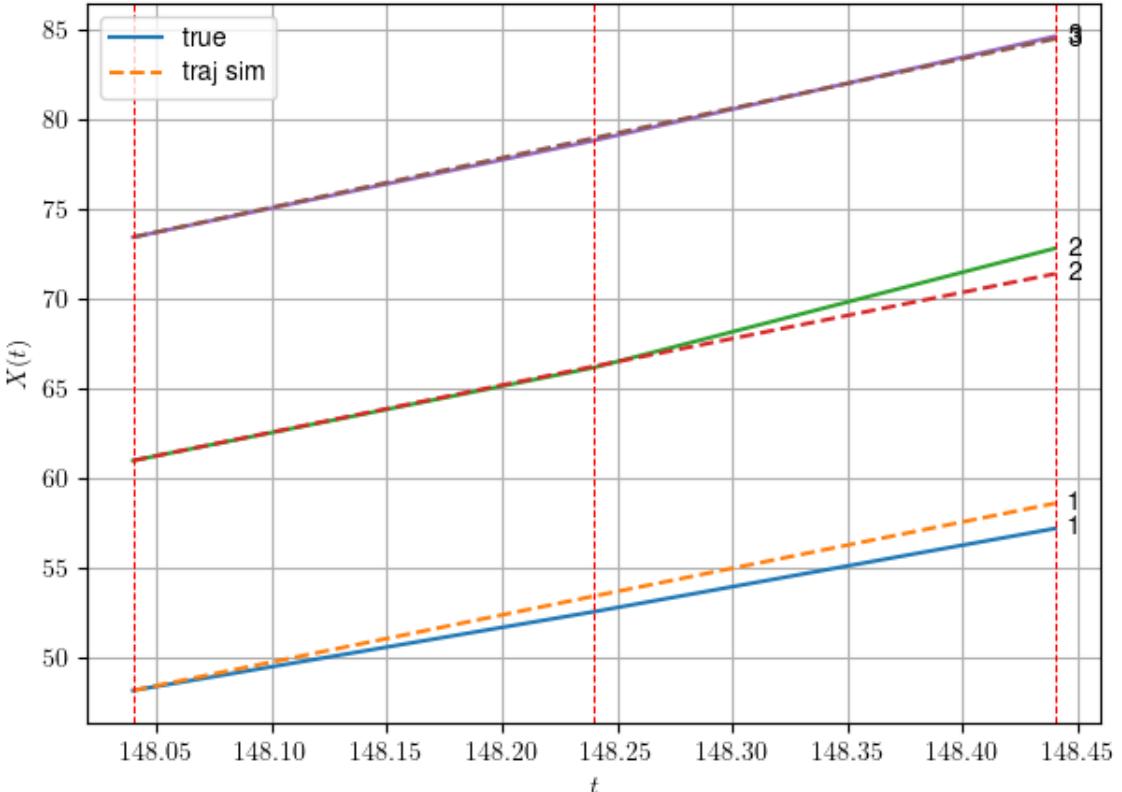
- Time interval n.0: [148.04, 148.24]
  - \* y\_true: [21.93113488 25.90203153]
  - \* v\_ann: [26.26824951171875, 26.248779296875, 27.62

1673906725427]

```
- Time interval n.1: [148.24, 148.44]
  * y_true: [23.17638158 33.20310746]
  * v_ann: [25.848466873168945, 25.774852752685547, 2
7.621673906725427]
```

```
* err= 0.5297656886182809
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0003558047405763931
```

df n. 1 – Scene n. 5, at it = 350



For scene 5/28

```
* use LR_NN=0.0001 with err=0.8053700366227696 at it=19
* v0 scn mean = 27.82551318590763
* MAE = 0.5262746090773066
```

```
=====
=====
- Time interval n.0: [161.64, 161.84]
  * y_true: [31.66062591 25.70084842]
  * v_ann: [28.075531005859375, 27.44732666015625, 3
4.71178115124991]
```

```
=====
- Time interval n.1: [161.84, 162.04]
  * y_true: [29.96082912 27.30094687]
  * v_ann: [29.278493881225586, 29.782644271850586, 3
```

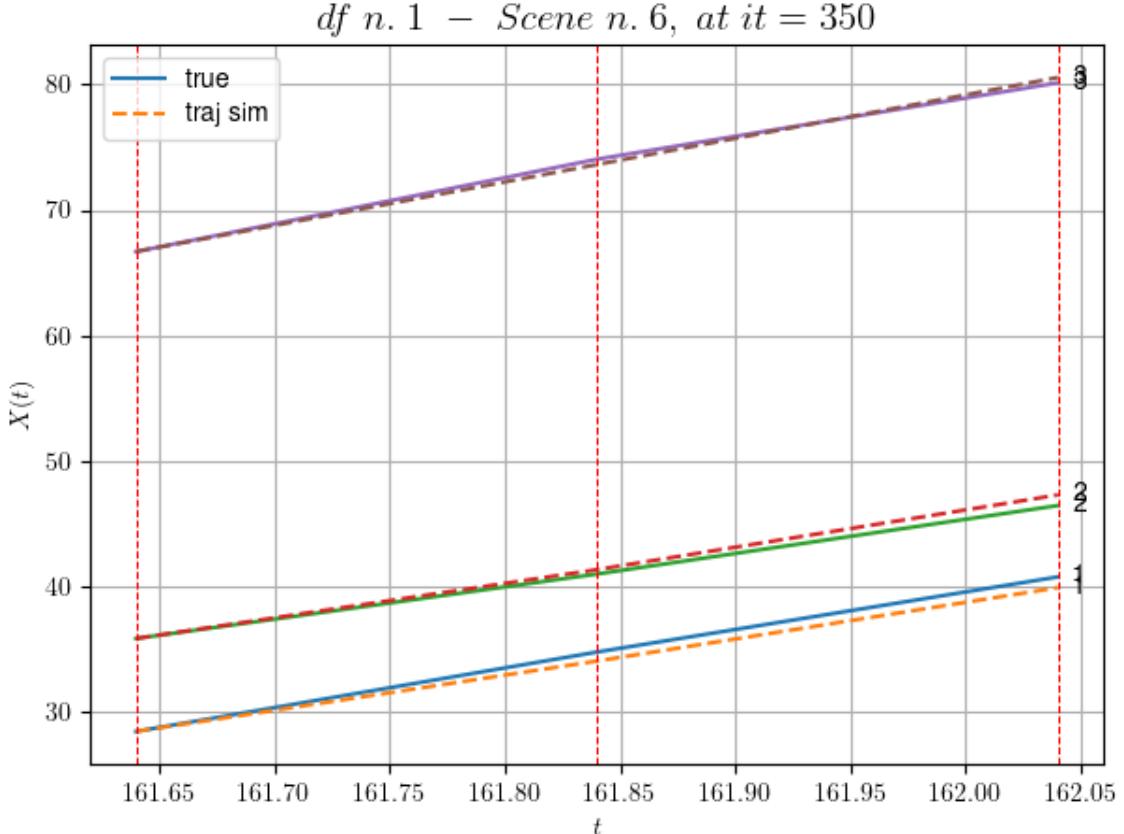
4.71178115124991]

---



---

- \* err= 0.27090242218909916
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.00010132407160300050



For scene 6/28

- \* use LR\_NN=0.0005 with err=13.17325228651656 at it=19
- \* v0\_scn\_mean = 34.30794835630662
- \* MAE = 0.2695889017098869

---



---

- Time interval n.0: [164.04, 164.24]
- \* y\_true: [27.950014 32.5307084]
- \* v\_ann: [27.583831787109375, 27.969690322875977, 3 2.43283336687014]

---



---

- Time interval n.1: [164.24, 164.44]
- \* y\_true: [26.70005561 31.43096027]
- \* v\_ann: [28.80771827697754, 29.205530166625977, 3 2.43283336687014]

---



---

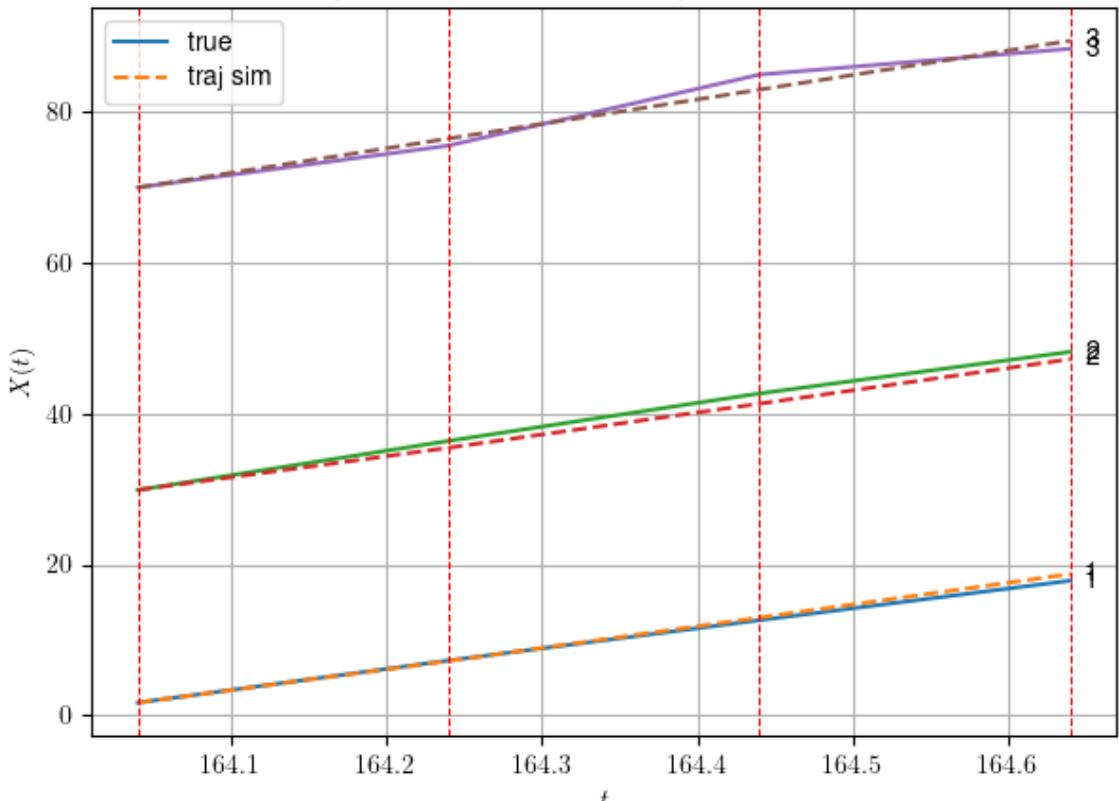
- Time interval n.2: [164.44, 164.64]
- \* y\_true: [26.20012328 27.61110245]
- \* v\_ann: [28.838523864746094, 29.539533615112305, 3 2.43283336687014]

```

* err= 0.8735353808766231
* Learning rate NN = 2.952449540316593e-05
* diff = 0.0014728235969990733

```

*df n. 1 – Scene n. 7, at it = 350*



For scene 7/28

```

* use LR_NN=5e-05 with err=1.5691169374521 at it=19
* v0_scn_mean = 32.22432243084916
* MAE = 0.7720726423097038

```

---



---



---

```

- Time interval n.0: [215.64, 215.84]
  * y_true: [29.28007092 34.74092457]
  * v_ann: [31.494083404541016, 31.85009002685547, 3
7.48372439573744]

```

---



---



---

```

- Time interval n.1: [215.84, 216.04]
  * y_true: [29.05016449 33.87124084]
  * v_ann: [31.58264923095703, 31.945035934448242, 3
7.48372439573744]

```

---



---

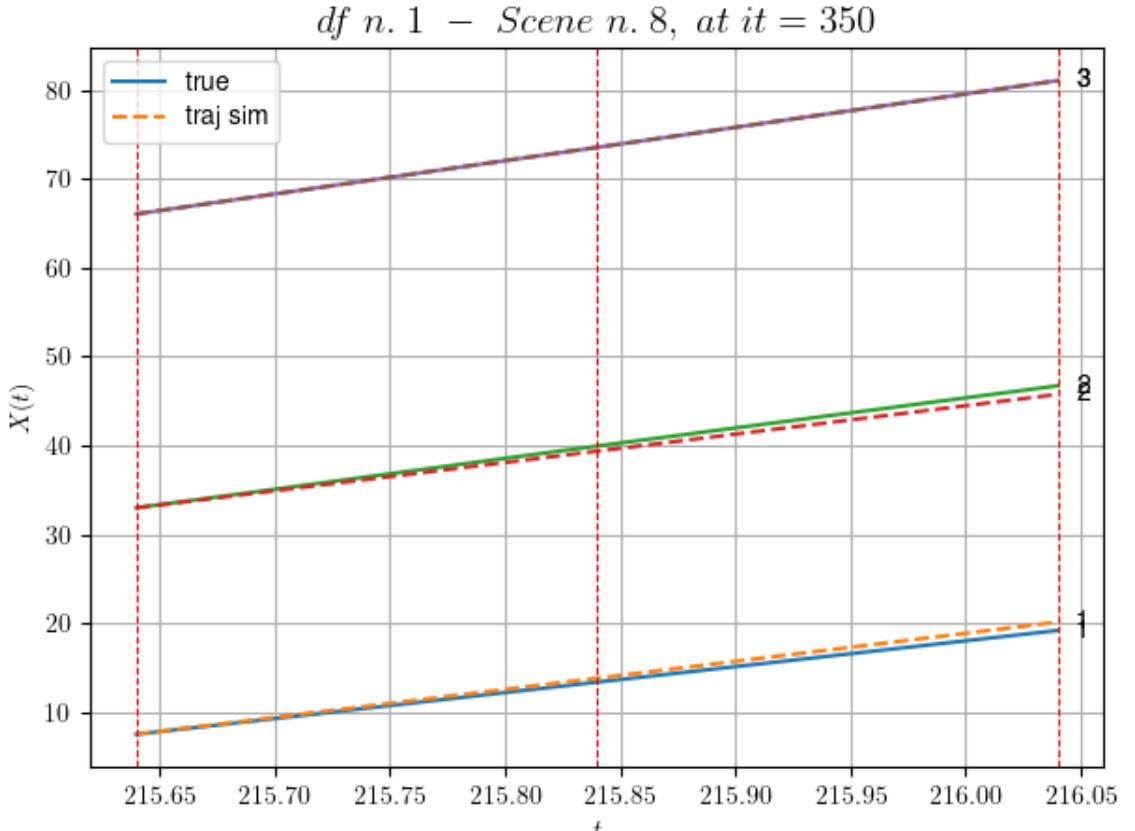


---

```

* err= 0.262218499072368
* Learning rate NN = 7.289998848136747e-06
* diff = 4.35128256857098e-05

```



For scene 8/28

- \* use LR\_NN=1e-05 with err=1.34270073710192 at it=19
- \* v0\_scn\_mean = 36.84231656241397
- \* MAE = 0.26130439537843037

---



---

- Time interval n.0: [216.64, 216.84]
- \* y\_true: [37.52054047 34.13112536]
- \* v\_ann: [36.11357879638672, 37.58447265625, 34.85179005228114]

---



---

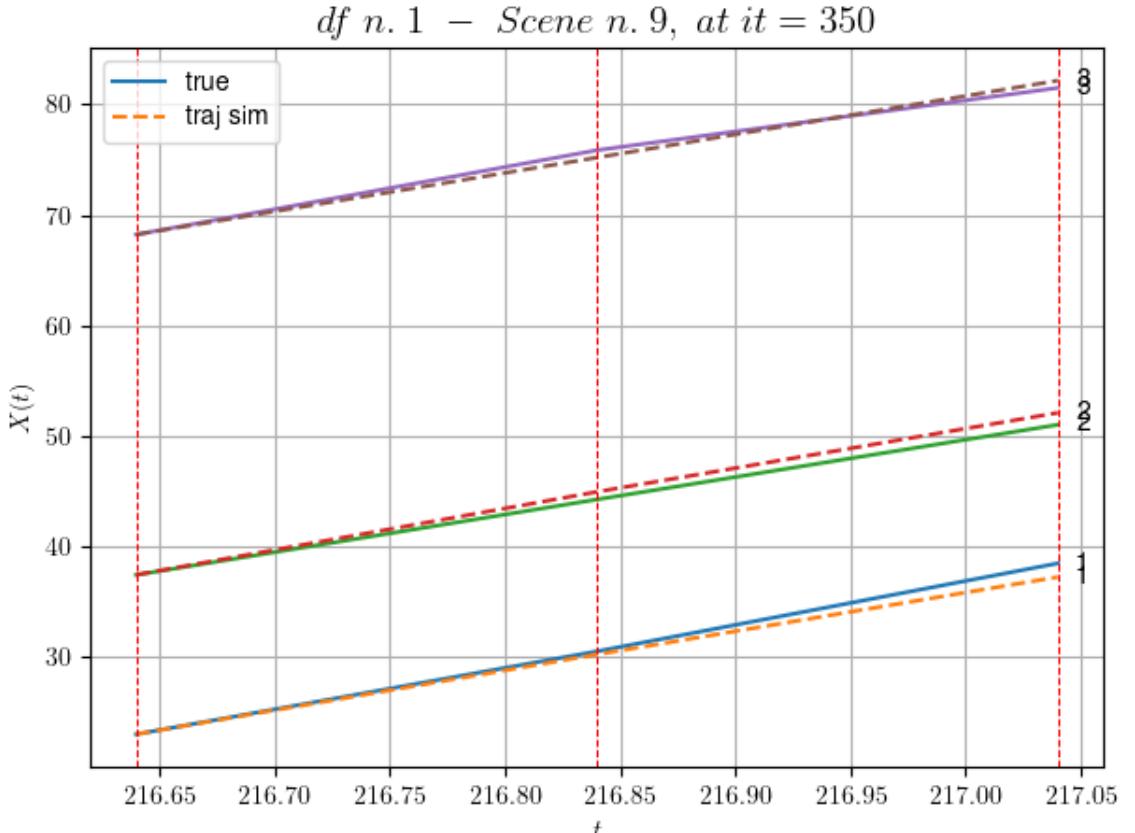
- Time interval n.1: [216.84, 217.04]
- \* y\_true: [39.83095433 33.81148861]
- \* v\_ann: [35.04497528076172, 35.779170989990234, 34.85179005228114]

---



---

- \* err= 0.46124421948554656
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.003367943097041526



For scene 9/28

- \* use LR\_NN=0.0001 with err=9.22209513020593 at it=19
- \* v0\_scn\_mean = 34.435957509470455
- \* MAE = 0.46124421948554656

---



---

- Time interval n.0: [240.64, 240.84]
- \* y\_true: [28.54090912 24.62265201]
- \* v\_ann: [31.03337287902832, 31.101516723632812, 3

3.34474567234067]

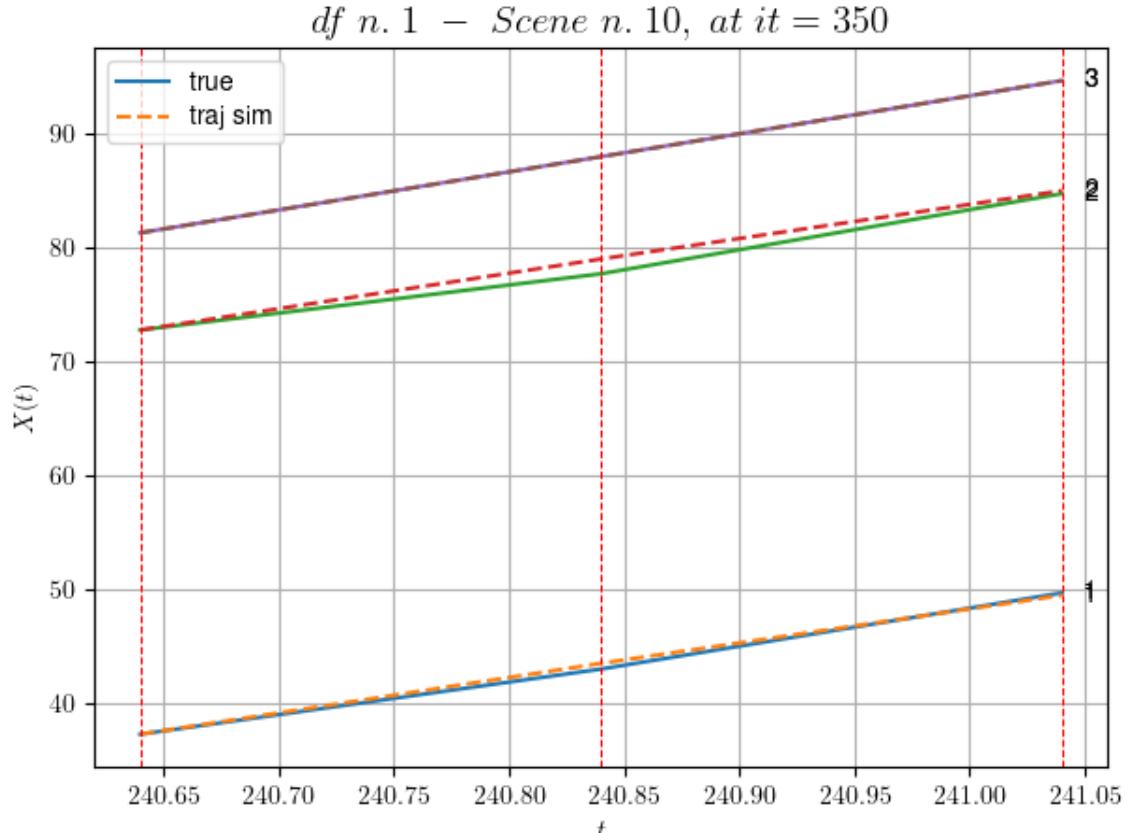
---

- Time interval n.1: [240.84, 241.04]
- \* y\_true: [33.36143299 35.0745887 ]
- \* v\_ann: [29.806907653808594, 29.88713836669922, 3

3.34474567234067]

---

- \* err= 0.2266053642957406
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 0.00014748822649826576



For scene 10/28

- \* use LR\_NN=5e-05 with err=8.550001880921627 at it=19
- \* v0\_scn\_mean = 33.058077435875916
- \* MAE = 0.2266053642957406

---



---

- Time interval n.0: [253.64, 253.84]
- \* y\_true: [26.81042151 28.10122634]
- \* v\_ann: [30.464099884033203, 31.973514556884766, 2  
7.474897828445044]

---



---

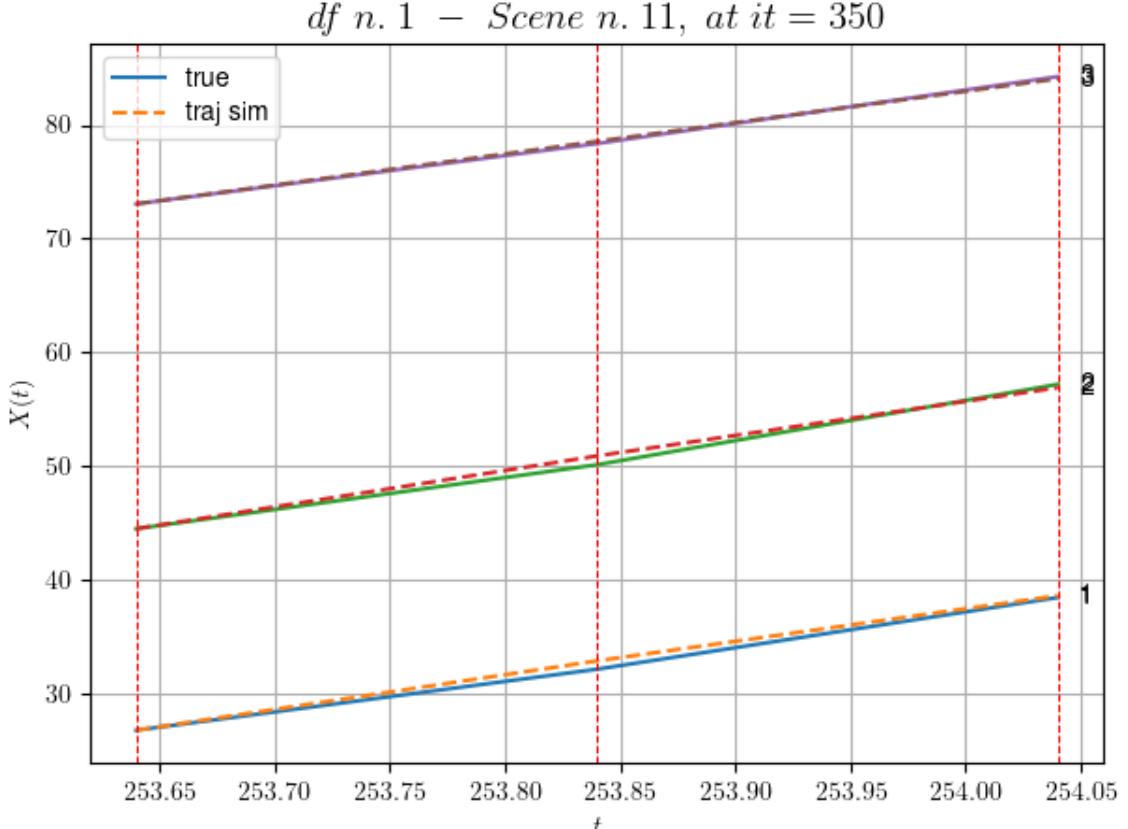
- Time interval n.1: [253.84, 254.04]
- \* y\_true: [31.5007643 35.35225595]
- \* v\_ann: [28.639738082885742, 29.992172241210938, 2  
7.474897828445044]

---



---

- \* err= 0.14743732553853703
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 6.22989019931075e-05



For scene 11/28

\* use LR\_NN=0.0001 with err=1.6112963503855704 at it=19  
 \* v0\_scn\_mean = 27.691316850195893  
 \* MAE = 0.14379401887626322

---



---

- Time interval n.0: [262.64, 262.84]  
 \* y\_true: [36.75102901 34.57147294]  
 \* v\_ann: [29.89531707763672, 28.791893005371094, 3  
 5.9310545703503]

---

- Time interval n.1: [262.84, 263.04]  
 \* y\_true: [20.65076329 34.76181544]  
 \* v\_ann: [33.063880920410156, 33.648014068603516, 3  
 5.9310545703503]

---

- Time interval n.2: [263.04, 263.24]  
 \* y\_true: [40.30193432 23.95156631]  
 \* v\_ann: [28.860090255737305, 29.30108642578125, 3  
 5.9310545703503]

---

- Time interval n.3: [263.24, 263.44]  
 \* y\_true: [32.10201673 27.4721836 ]  
 \* v\_ann: [31.792383193969727, 33.35710906982422, 3

5.9310545703503]

---

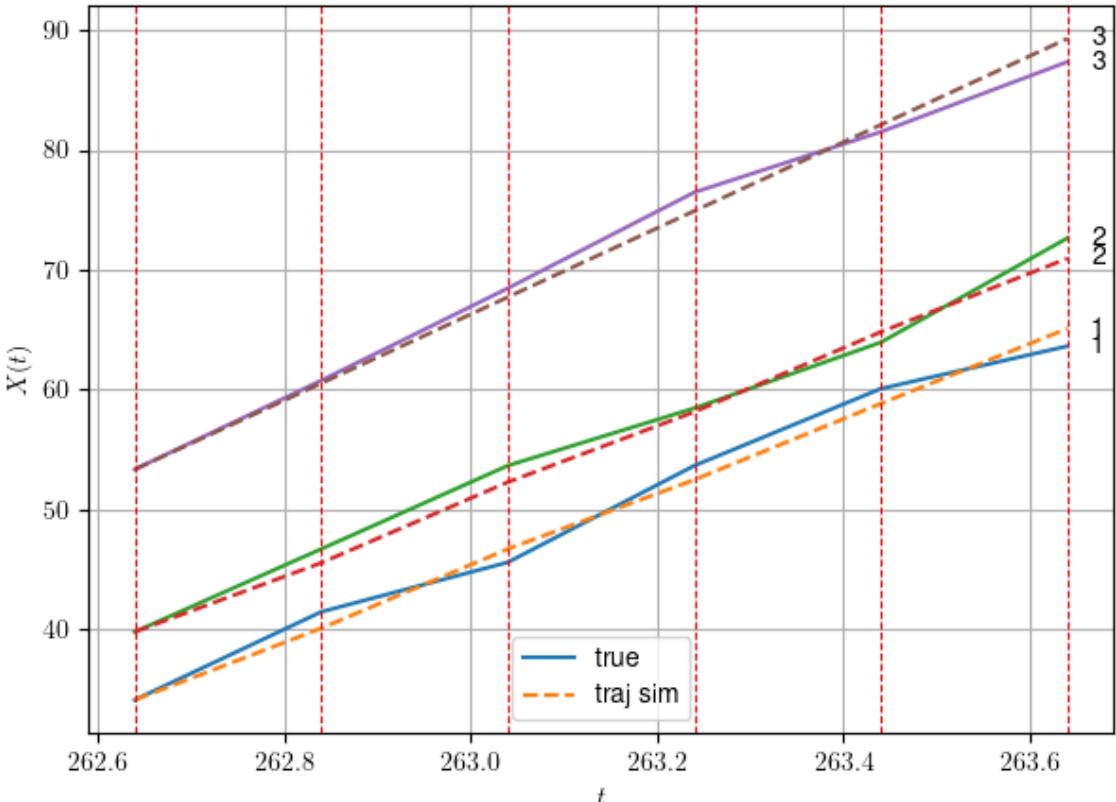
- Time interval n.4: [263.44, 263.64]
  - \* y\_true: [17.75131644 43.4543127 ]
  - \* v\_ann: [31.26824188232422, 30.617300033569336, 3

5.9310545703503]

---

- \* err= 1.2372615328035284
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 0.004932990035938056

*df n. 1 – Scene n. 12, at it = 350*



For scene 12/28

- \* use LR\_NN=0.001 with err=29.836403833716655 at it=19
- \* v0\_scn\_mean = 35.42272146505045
- \* MAE = 1.2372615328035284

---



---

- Time interval n.0: [314.84, 315.04]
  - \* y\_true: [29.62016755 31.54681236]
  - \* v\_ann: [29.605812072753906, 29.65815544128418, 3

0.926241166014943]

---



---

- Time interval n.1: [315.04, 315.24]
  - \* y\_true: [30.12030665 32.32740505]
  - \* v\_ann: [29.886411666870117, 29.970138549804688, 3

0.926241166014943]

---

- Time interval n.2: [315.24, 315.44]
  - \* y\_true: [25.99040223 31.02242591]
  - \* v\_ann: [30.262645721435547, 30.382064819335938, 3

0.926241166014943]

---

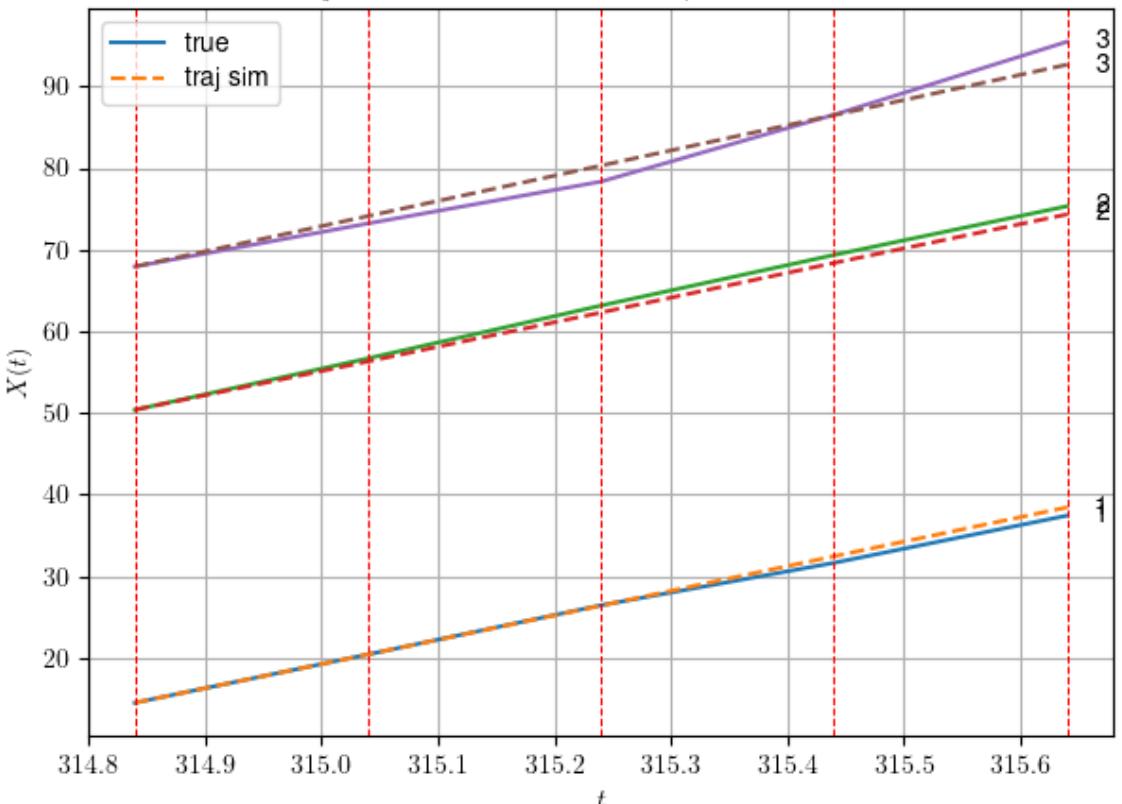
- Time interval n.3: [315.44, 315.64]
  - \* y\_true: [28.95064907 29.88823464]
  - \* v\_ann: [29.979007720947266, 29.794647216796875, 3

0.926241166014943]

---

- \* err= 1.1387368239448383
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 0.0001691524666920241

*df n. 1 – Scene n. 13, at it = 350*



For scene 13/28

- \* use LR\_NN=5e-05 with err=22.32351520894629 at it=19
- \* v0\_scn\_mean = 30.8468557814111
- \* MAE = 1.1387368239448383

---

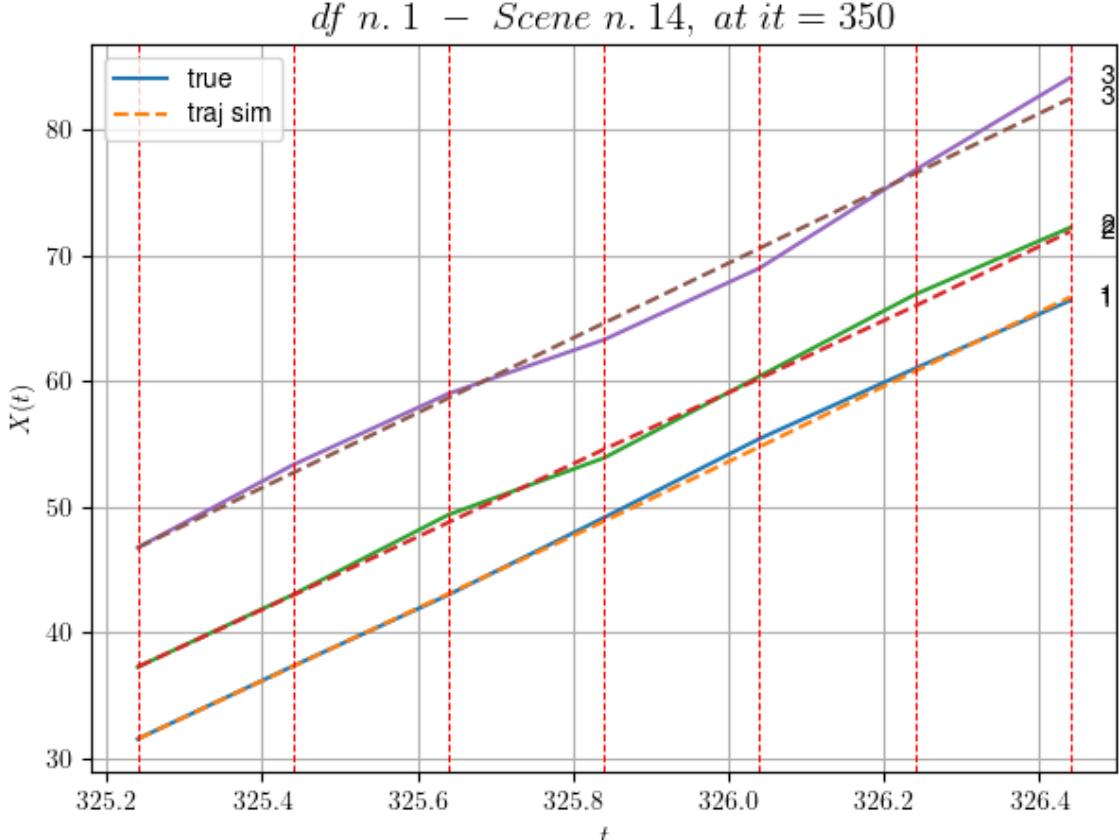


---

- Time interval n.0: [325.24, 325.44]
  - \* y\_true: [29.06068603 28.85087529]
  - \* v\_ann: [28.87822723388672, 28.55333137512207, 29.

804035226087322]

```
-----  
-----  
    - Time interval n.1: [325.44, 325.64]  
      * y_true: [28.37089255 31.80128105]  
      * v_ann: [28.977991104125977, 29.064029693603516, 2  
9.804035226087322]  
  
-----  
-----  
    - Time interval n.2: [325.64, 325.84]  
      * y_true: [30.70143178 22.60113815]  
      * v_ann: [28.82945442199707, 29.068988800048828, 2  
9.804035226087322]  
  
-----  
-----  
    - Time interval n.3: [325.84, 326.04]  
      * y_true: [31.42655806 32.52725213]  
      * v_ann: [29.64974021911621, 28.171035766601562, 2  
9.804035226087322]  
  
-----  
-----  
    - Time interval n.4: [326.04, 326.24]  
      * y_true: [27.9669351 32.52725213]  
      * v_ann: [30.117919921875, 28.8725643157959, 29.804  
035226087322]  
  
-----  
-----  
    - Time interval n.5: [326.24, 326.44]  
      * y_true: [27.10202936 26.72764736]  
      * v_ann: [29.504261016845703, 29.696367263793945, 2  
9.804035226087322]  
  
-----  
-----  
    * err= 0.48107457457805997  
    * Learning rate NN = 0.00031381050939671695  
    * diff = 3.5889695290780566e-05
```



For scene 14/28

- \* use LR\_NN=0.001 with err=16.152751360454044 at it=19
- \* v0\_scn\_mean = 29.820830785944562
- \* MAE = 0.47821247482744234

---



---

- Time interval n.0: [354.04, 354.24]
- \* y\_true: [29.77169216 32.15176545]
- \* v\_ann: [28.7645320892334, 26.396759033203125, 32.6935027099963]

---

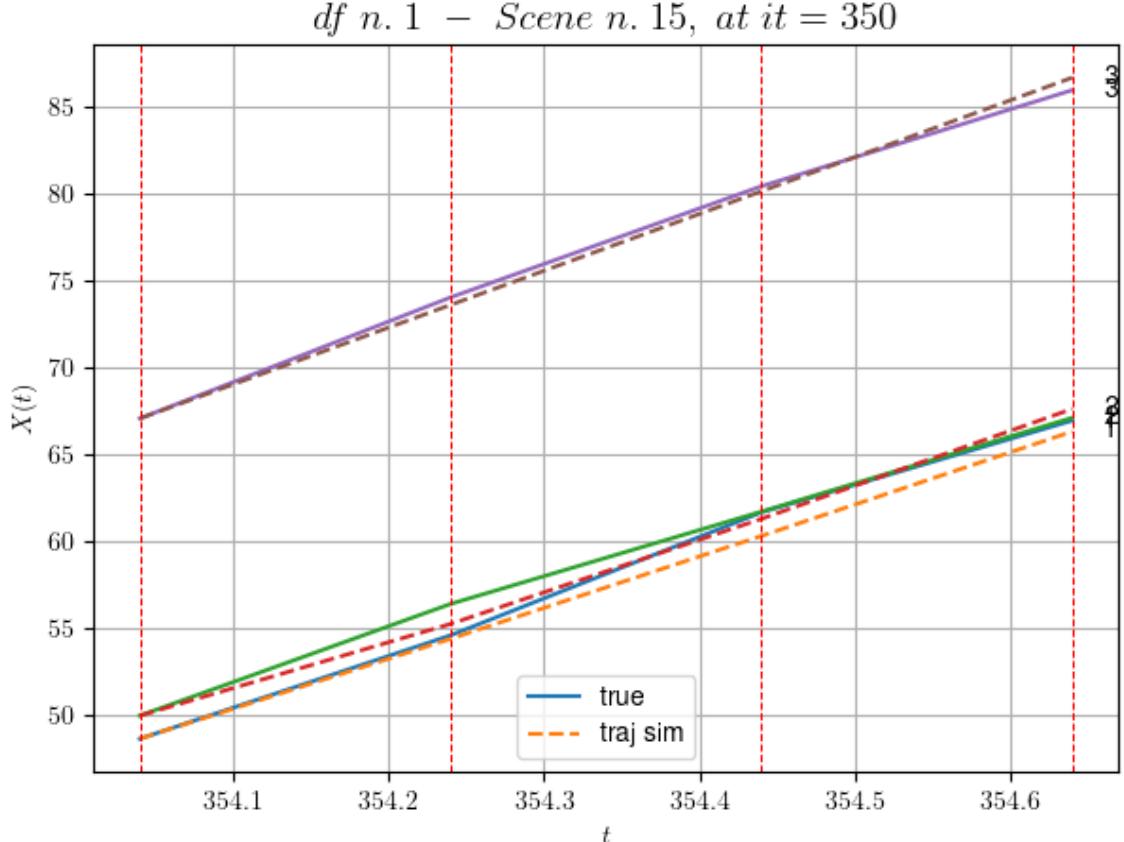
- Time interval n.1: [354.24, 354.44]
- \* y\_true: [35.38251939 26.55179403]
- \* v\_ann: [29.59451675415039, 30.23817253112793, 32.6935027099963]

---

- Time interval n.2: [354.44, 354.64]
- \* y\_true: [26.40441101 27.01000163]
- \* v\_ann: [30.061931610107422, 31.632890701293945, 32.6935027099963]

---

- \* err= 0.4021806997744967
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 4.164343935408876e-05



For scene 15/28

```
* use LR_NN=0.001 with err=20.929832204483322 at it=19
* v0_scn_mean = 32.46265057729938
* MAE = 0.3988360855593889
```

---



---

```
- Time interval n.0: [363.44, 363.64]
* y_true: [23.6502752 28.55056389]
* v_ann: [29.666641235351562, 29.479652404785156, 3
8.923429963342]
```

---

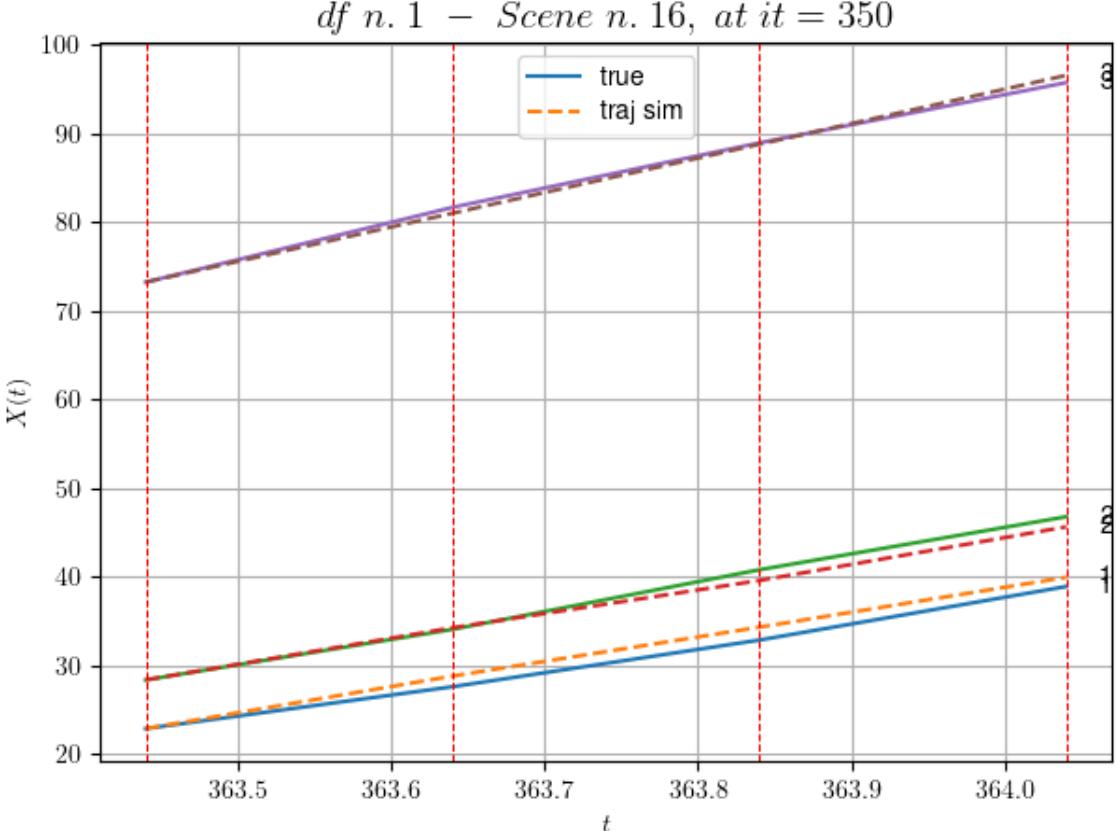
```
- Time interval n.1: [363.64, 363.84]
* y_true: [26.3393983 33.66093634]
* v_ann: [27.597068786621094, 26.674556732177734, 3
8.923429963342]
```

---

```
- Time interval n.2: [363.84, 364.04]
* y_true: [30.2407755 29.94110461]
* v_ann: [28.167112350463867, 30.300365447998047, 3
8.923429963342]
```

---

```
* err= 0.7148127464683705
* Learning rate NN = 0.0002952449722215533
* diff = 0.0004274108156706591
```



For scene 16/28

- \* use LR\_NN=0.0005 with err=22.629335760392134 at it=19
- \* v0\_scn\_mean = 38.15862923365898
- \* MAE = 0.7009048493897319

---



---

- Time interval n.0: [386.64, 386.84]
  - \* y\_true: [28.15052447 34.1607672 ]
  - \* v\_ann: [35.555755615234375, 35.01260757446289, 39.346032634271914]

---

- Time interval n.1: [386.84, 387.04]
  - \* y\_true: [34.00091123 38.91120777]
  - \* v\_ann: [33.42256546020508, 32.424259185791016, 39.346032634271914]

---

- Time interval n.2: [387.04, 387.24]
  - \* y\_true: [32.52639997 34.00151192]
  - \* v\_ann: [34.055755615234375, 35.845420837402344, 39.346032634271914]

---

- Time interval n.3: [387.24, 387.44]
  - \* y\_true: [32.52639997 39.36234046]
  - \* v\_ann: [32.95470428466797, 34.04794692993164, 39.

346032634271914]

```

-----  

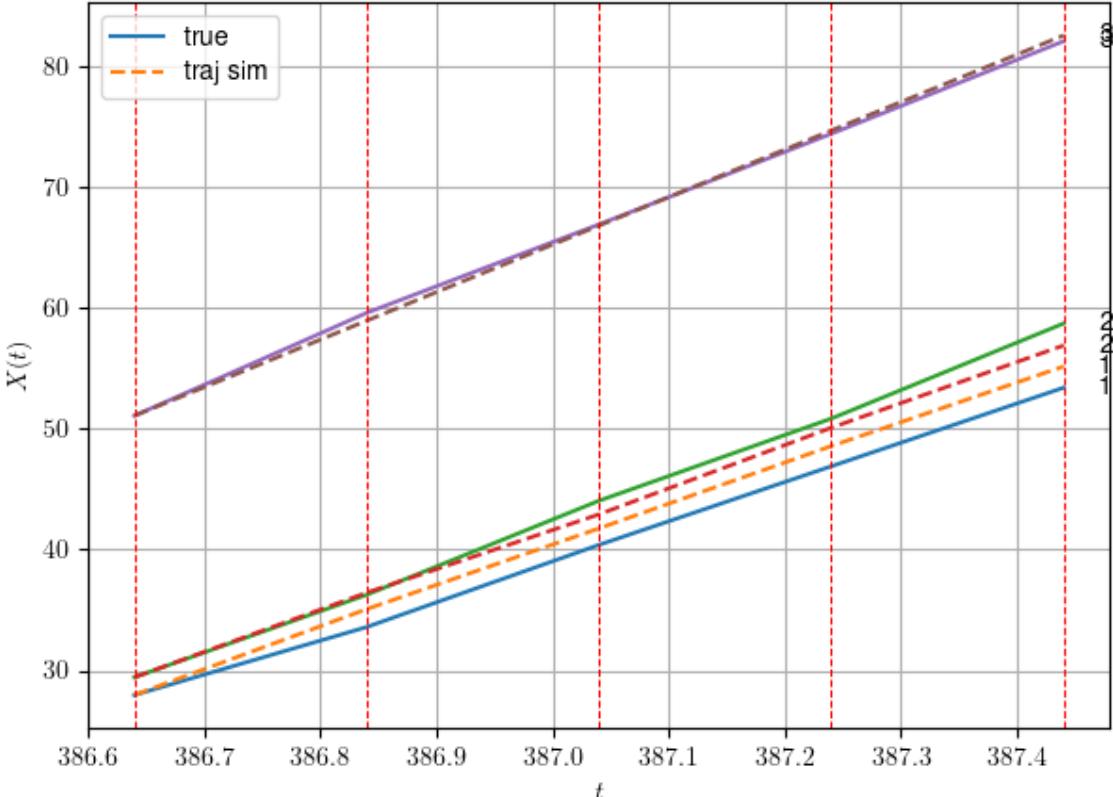
* err= 1.0569907453148295  

* Learning rate NN = 0.000478296831715852  

* diff = 0.00245241573107835

```

*df n. 1 – Scene n. 17, at it = 350*



For scene 17/28

```

* use LR_NN=0.001 with err=31.5443540098548 at it=19  

* v0_scn_mean = 38.545011882419935  

* MAE = 1.0550445323384257

```

---



---

- Time interval n.0: [431.84, 432.04]  
\* y\_true: [30.8908033 31.49166882]  
\* v\_ann: [33.90555191040039, 35.939048767089844, 3  
0.08416102804866]

---



---

- Time interval n.1: [432.04, 432.24]  
\* y\_true: [39.73151551 26.376716 ]  
\* v\_ann: [27.907726287841797, 29.09624481201172, 3  
0.08416102804866]

---



---

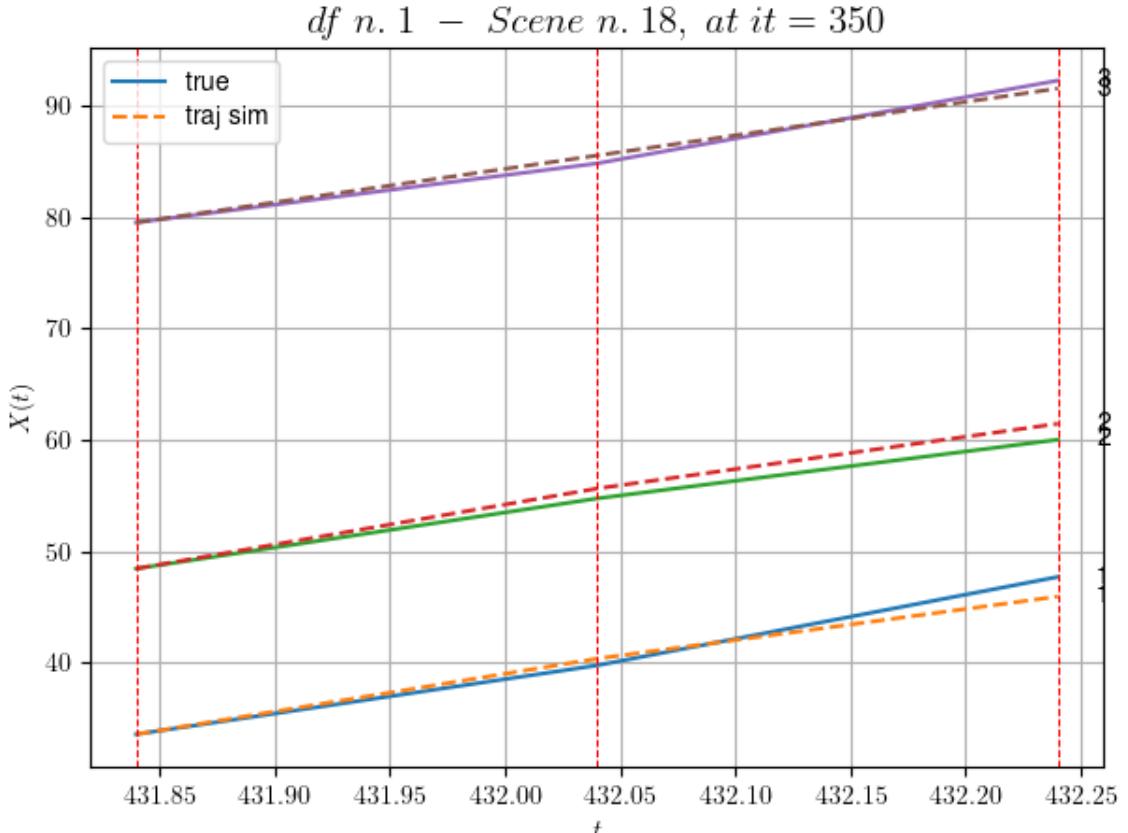
```

* err= 0.8138591811406176  

* Learning rate NN = 0.00036449998151510954  

* diff = 0.0021303456904394613

```



For scene 18/28

```
* use LR_NN=0.0005 with err=7.082616334627342 at it=19
* v0_scn_mean = 30.076947835820903
* MAE = 0.8138591811406176
```

---



---

```
- Time interval n.0: [446.24, 446.44]
* y_true: [25.89017971 23.30046083]
* v_ann: [26.329458236694336, 26.281164169311523, 2
9.55443242874609]
```

---

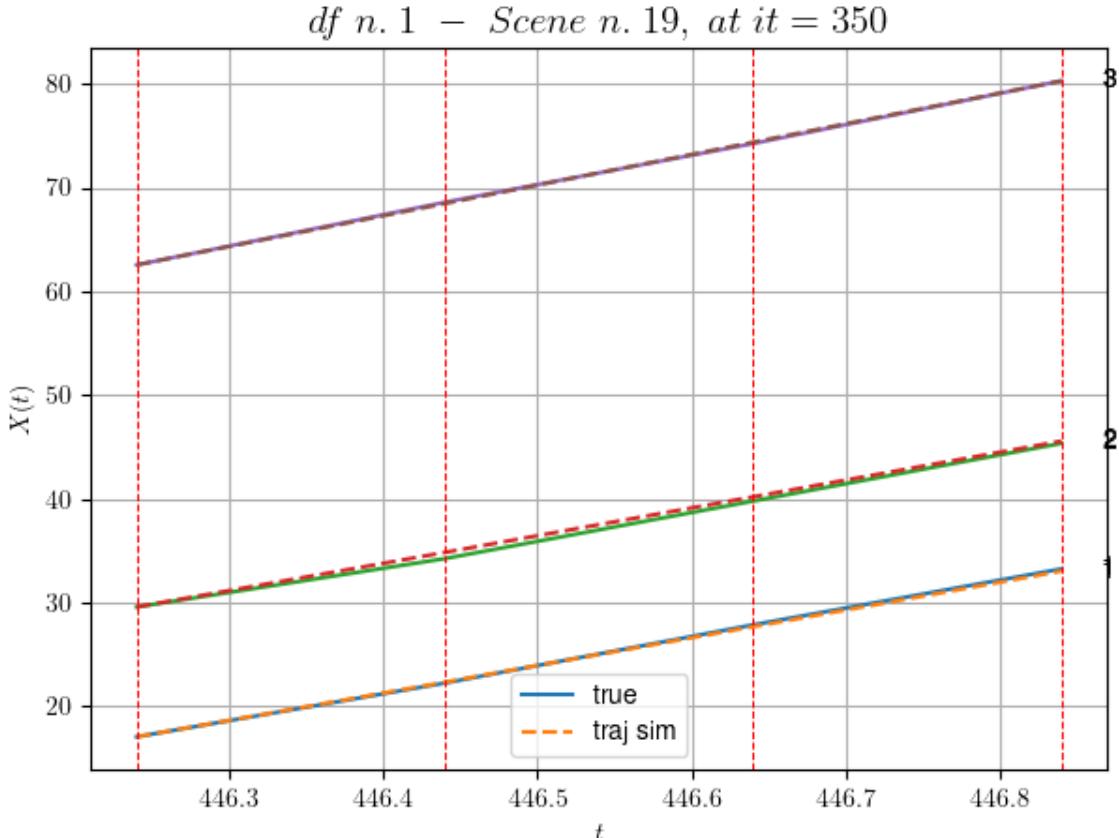
```
- Time interval n.1: [446.44, 446.64]
* y_true: [28.05031625 27.72075411]
* v_ann: [26.70108985900879, 26.781431198120117, 2
9.55443242874609]
```

---

```
- Time interval n.2: [446.64, 446.84]
* y_true: [26.94045507 27.8009832 ]
* v_ann: [26.77066993713379, 26.845951080322266, 2
9.55443242874609]
```

---

```
* err= 0.05755305011106141
* Learning rate NN = 5.9048988987342454e-06
* diff = 6.616785556662341e-06
```



For scene 19/28

```
* use LR_NN=1e-05 with err=12.286312347619694 at it=19
* v0_scn_mean = 29.59262070444424
* MAE = 0.054977475007677024
```

---



---

```
- Time interval n.0: [447.44, 447.64]
* y_true: [31.0713577 29.31148494]
* v_ann: [25.81718635559082, 24.07386016845703, 32.
58484136741204]
```

---

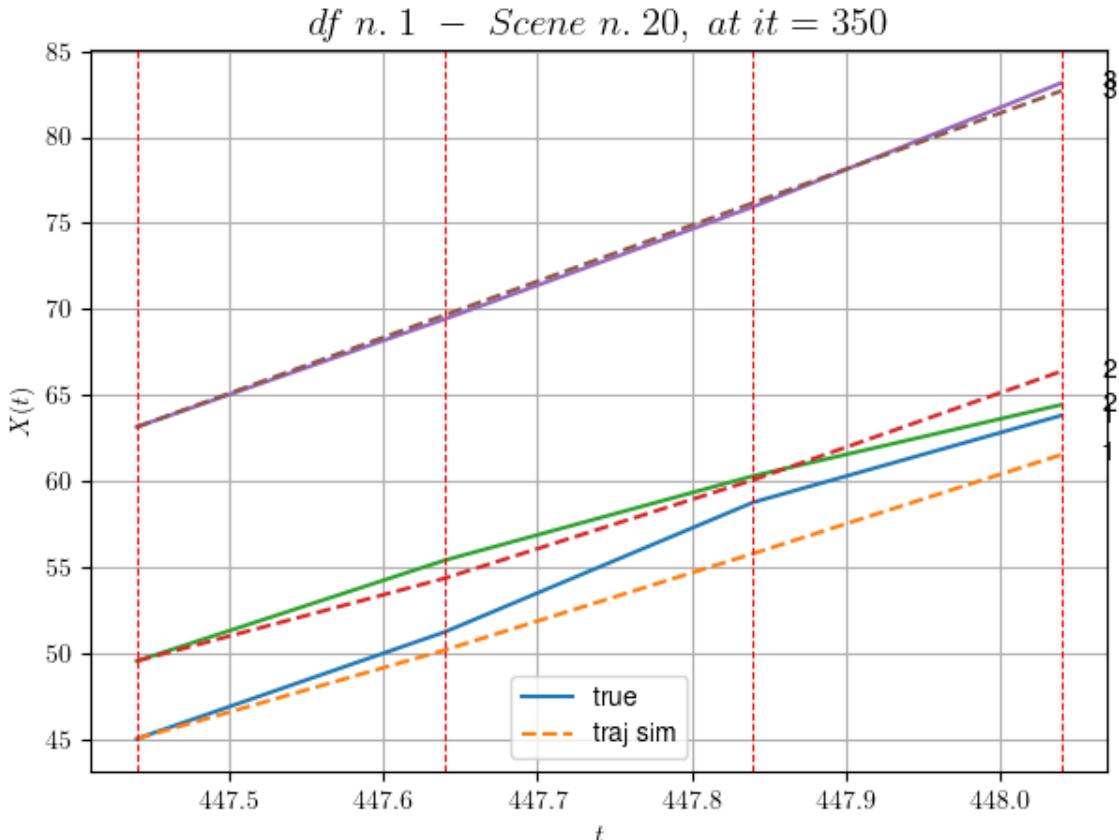
```
- Time interval n.1: [447.64, 447.84]
* y_true: [37.68225285 24.50151408]
* v_ann: [28.036338806152344, 28.580425262451172, 3
2.58484136741204]
```

---

```
- Time interval n.2: [447.84, 448.04]
* y_true: [25.261801 20.71149408]
* v_ann: [28.74723243713379, 31.59554672241211, 32.
58484136741204]
```

---

```
* err= 1.7043897750244215
* Learning rate NN = 0.0005904899444431067
* diff = 0.0002352881133858009
```



For scene 20/28

```
* use LR_NN=0.001 with err=20.56554261016071 at it=19
* v0_scn_mean = 32.36330227627474
* MAE = 1.479363938899685
```

---



---

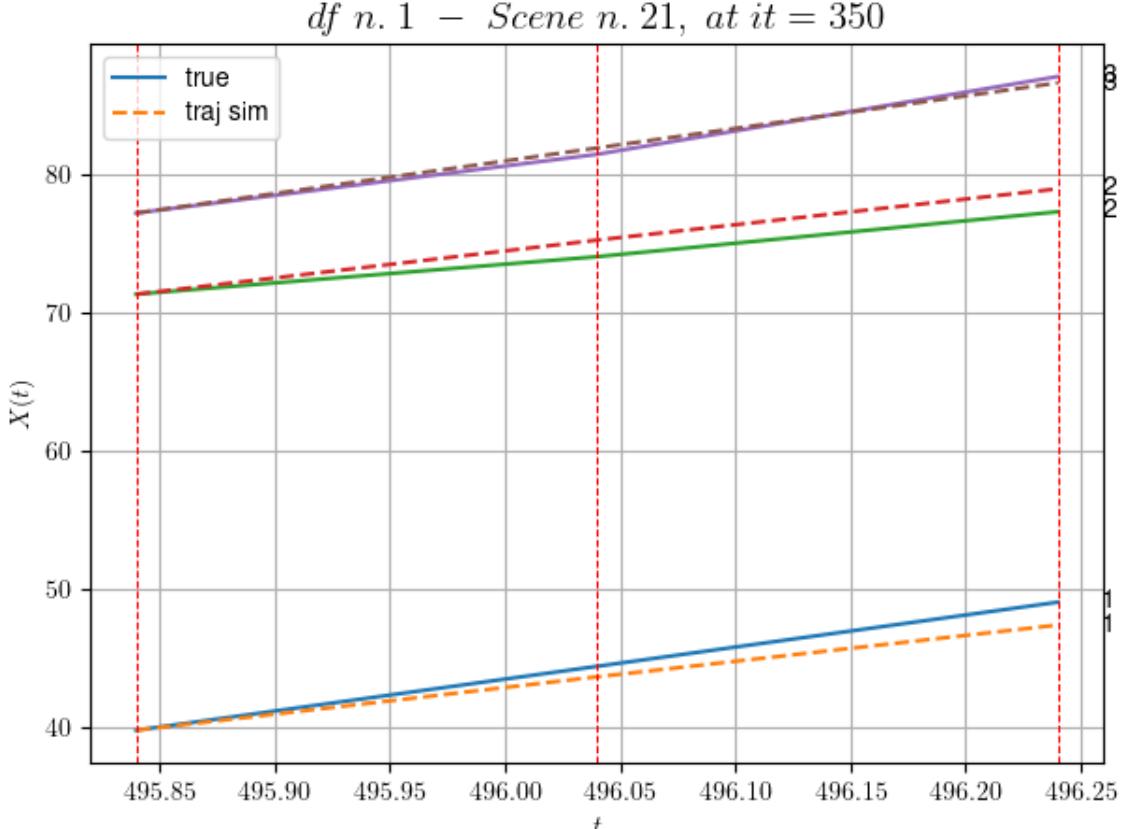
```
- Time interval n.0: [495.84, 496.04]
* y_true: [23.1307843 13.57637571]
* v_ann: [19.335872650146484, 19.579660415649414, 2
3.563140002877937]
```

---

```
- Time interval n.1: [496.04, 496.24]
* y_true: [23.23098731 16.2618474 ]
* v_ann: [18.74953269958496, 18.56197738647461, 23.
563140002877937]
```

---

```
* err= 0.8818814902398683
* Learning rate NN = 7.289998757187277e-05
* diff = 0.0001098069095720744
```



For scene 21/28

\* use LR\_NN=0.0001 with err=2.7474905524714033 at it=19  
 \* v0\_scn\_mean = 24.114824191904944  
 \* MAE = 0.8818814902398683

- 
- 
- Time interval n.0: [496.84, 497.04]
    - \* y\_true: [19.47545433 17.05100655]
    - \* v\_ann: [17.945720672607422, 18.347597122192383, 2 3.671067862249625]

---

  - Time interval n.1: [497.04, 497.24]
    - \* y\_true: [13.44536038 20.12642582]
    - \* v\_ann: [17.969276428222656, 17.94878578186035, 2 3.671067862249625]

---

  - Time interval n.2: [497.24, 497.44]
    - \* y\_true: [18.49565962 22.17670532]
    - \* v\_ann: [17.476308822631836, 17.281036376953125, 2 3.671067862249625]

---

  - Time interval n.3: [497.44, 497.64]
    - \* y\_true: [20.96085077 13.7761341 ]
    - \* v\_ann: [19.561553955078125, 18.773080825805664, 2 3.671067862249625]

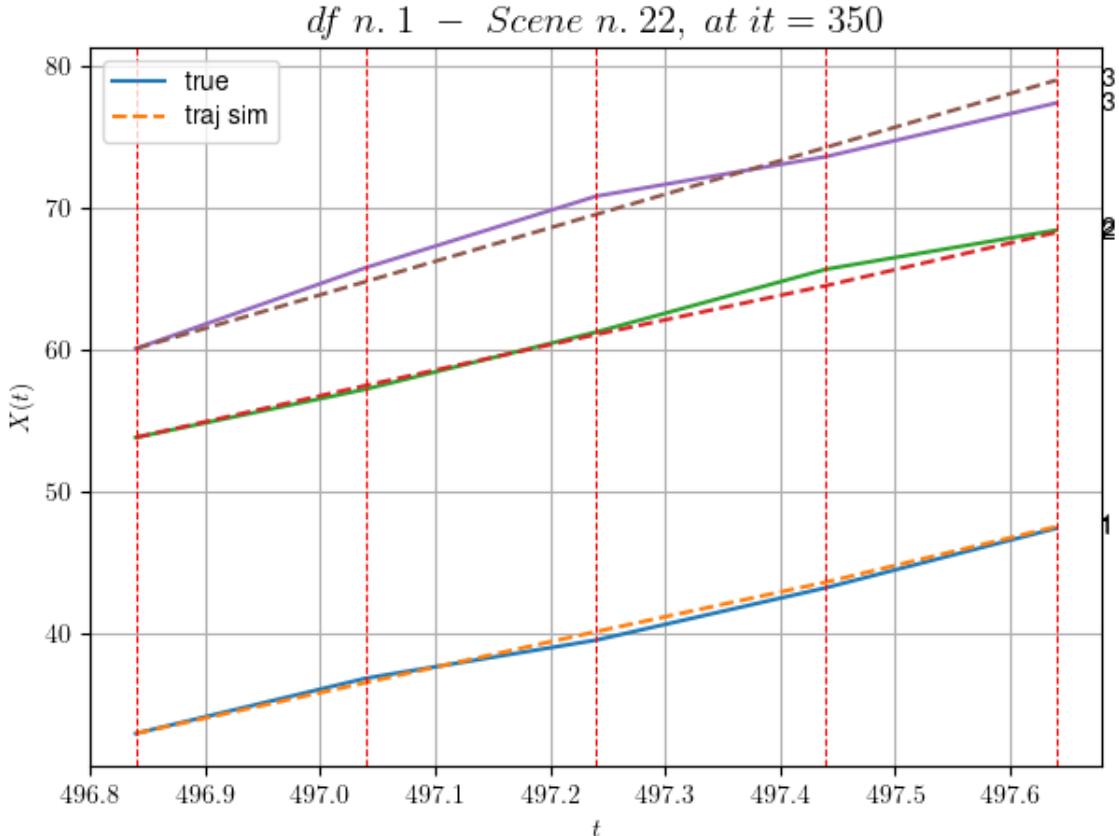
3.671067862249625]

---



---

- \* err= 0.5123909585473402
- \* Learning rate NN = 0.000478296831715852
- \* diff = 0.00019124800092973349



For scene 22/28

- \* use LR\_NN=0.001 with err=12.938552784596288 at it=19
- \* v0\_scn\_mean = 24.21350187438909
- \* MAE = 0.5118948633964108

---



---

- Time interval n.0: [499.04, 499.24]
- \* y\_true: [23.84103851 15.32650765]
- \* v\_ann: [24.114564895629883, 22.82451629638672, 1  
7.83225143987477]

---



---

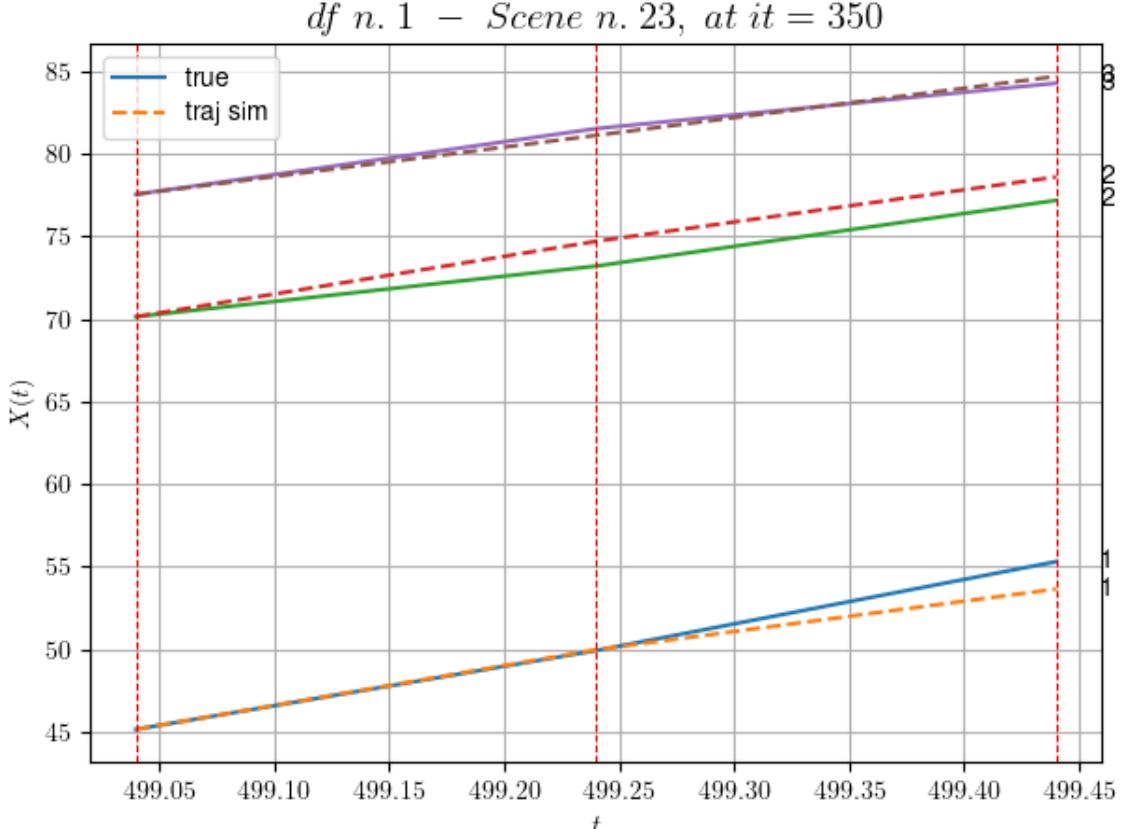
- Time interval n.1: [499.24, 499.44]
- \* y\_true: [26.92142921 19.88726092]
- \* v\_ann: [18.360538482666016, 19.472015380859375, 1  
7.83225143987477]

---



---

- \* err= 0.8154034702787653
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 0.000172647548831395



For scene 23/28

- \* use LR\_NN=0.001 with err=5.156997958251362 at it=19
- \* v0\_scn\_mean = 18.8751130990807
- \* MAE = 0.7736889179891189

---



---

For scene 24/28

- \* use LR\_NN=0.001 with err=10.328556004817495 at it=19
- \* v0\_scn\_mean = 14.185957297597577
- \* MAE = 0.04568819852192574

---



---

- Time interval n.0: [502.24, 502.44]
  - \* y\_true: [20.97545504 14.04040867]
  - \* v\_ann: [16.36461067199707, 17.633100509643555, 1 5.581120912086842]

---



---

- Time interval n.1: [502.44, 502.64]
  - \* y\_true: [18.07559412 14.7904947 ]
  - \* v\_ann: [17.37060546875, 17.776639938354492, 15.58 1120912086842]

---



---

- Time interval n.2: [502.64, 502.84]

```

* y_true: [18.07559412 14.18054394]
* v_ann: [17.580440521240234, 17.1754093170166, 15.
581120912086842]

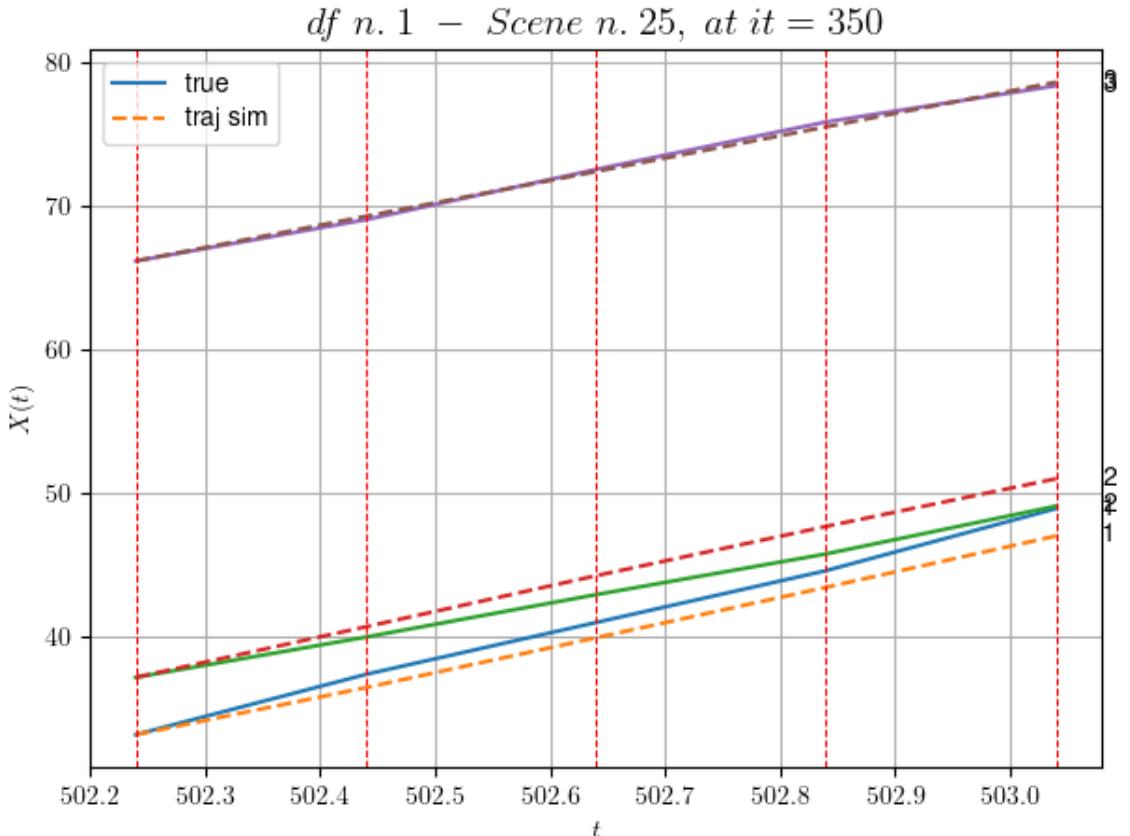
-----
- Time interval n.3: [502.84, 503.04]
* y_true: [21.64181695 16.68485314]
* v_ann: [17.912433624267578, 16.637880325317383, 1
5.581120912086842]

```

```

* err= 1.1184952223066649
* Learning rate NN = 0.000478296831715852
* diff = 0.0005085998967504501

```



For scene 25/28

```

* use LR_NN=0.001 with err=28.19295893685482 at it=19
* v0_scn_mean = 16.81692029561352
* MAE = 1.1184952223066649
=====
```

```

- Time interval n.0: [534.84, 535.04]
* y_true: [ 8.93323515 20.37071651]
* v_ann: [17.787670135498047, 18.420040130615234, 2
9.753484139130997]
```

```

- Time interval n.1: [535.04, 535.24]
```

```

* y_true: [ 8.47527286 31.64140498]
* v_ann: [16.347789764404297, 16.57191276550293, 2
9.753484139130997]

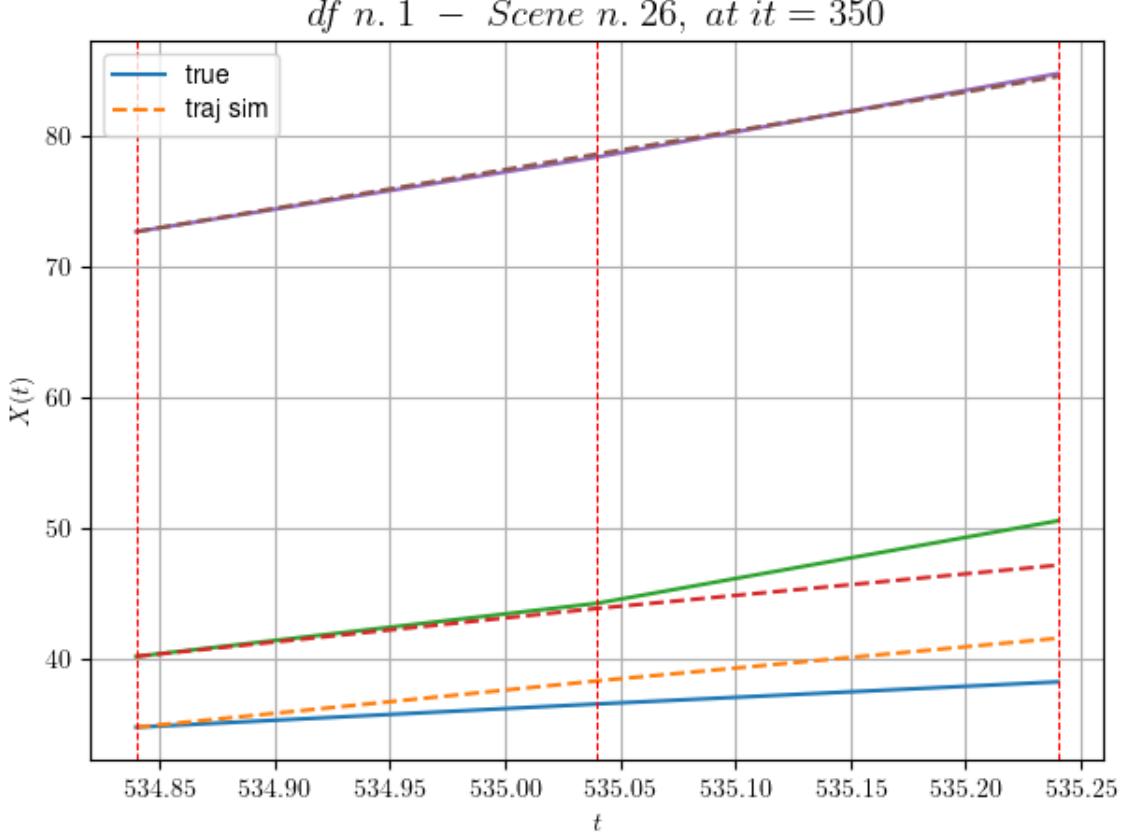
```

---

```

* err= 2.9081319883502146
* Learning rate NN = 0.00036449998151510954
* diff = 0.0011002112020176677

```



For scene 26/28

```

* use LR_NN=0.0005 with err=1.0149306598660301 at it=19
* v0_scn_mean = 29.774612282797154
* MAE = 1.9878983999795377

```

---

```

- Time interval n.0: [573.84, 574.04]
* y_true: [20.07571717 13.74586409]
* v_ann: [13.0833101272583, 13.77982234954834, 9.33
8868955850176]

```

---

```

- Time interval n.1: [574.04, 574.24]
* y_true: [13.45064024 11.92582032]
* v_ann: [14.10359001159668, 14.760293960571289, 9.
338868955850176]

```

---

```

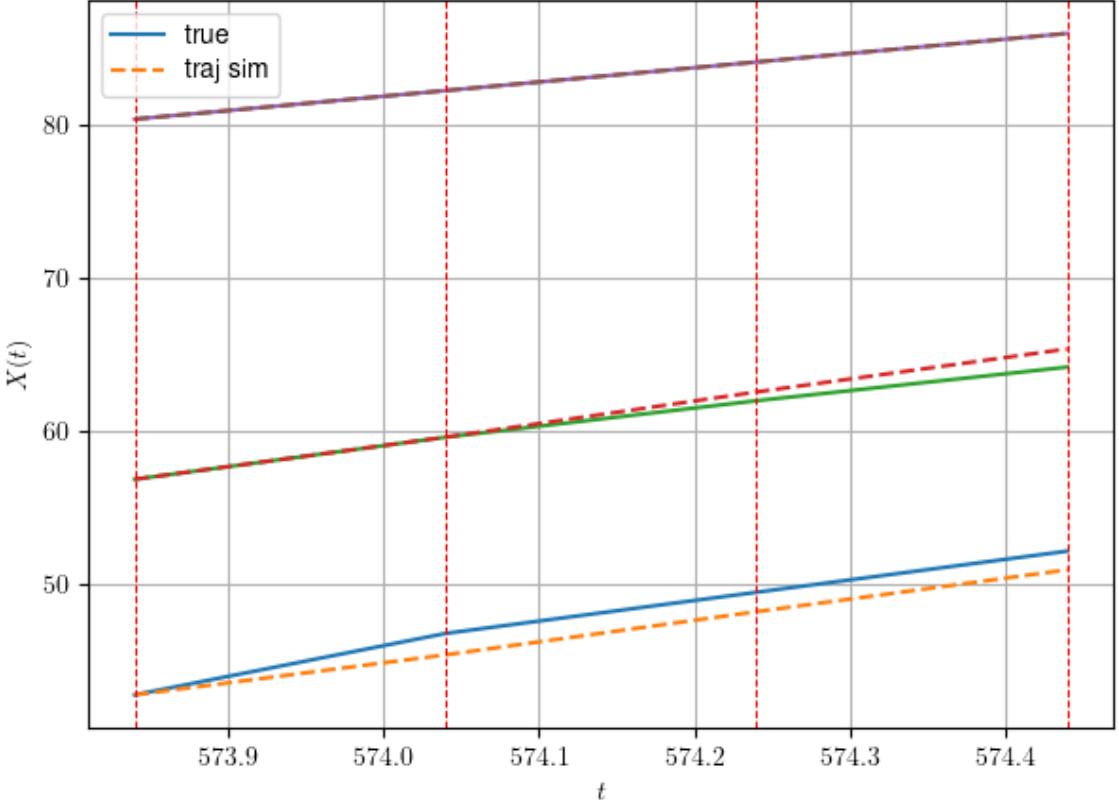
- Time interval n.2: [574.24, 574.44]
* y_true: [13.45064024 11.00083908]

```

```
* v_ann: [13.678764343261719, 14.065302848815918,
9.338868955850176]
```

```
-----  
-----  
* err= 0.5661972456040738  
* Learning rate NN = 0.0002952449722215533  
* diff = 0.00014215768851943977
```

*df n. 1 – Scene n. 27, at it = 350*



For scene 27/28

```
* use LR_NN=0.0005 with err=22.494754818647696 at it=19  
* v0_scn_mean = 11.10967325011269  
* MAE = 0.5661972456040738
```

```
=====
```

```
=====
```

For df=1 with 28 scenes, time taken: 268.09

```
=====
```

```
=====
```

```
=====
```

```
*****
```

```
*****
```

In df n.2/10 we have 18 scenes

```
*****
```

```
*****
```

```
- Time interval n.0: [86.16, 86.36]  
* y_true: [16.74023073 23.1409288 ]  
* v_ann: [18.39072036743164, 18.39065933227539, 16.  
235429521340052]
```

```

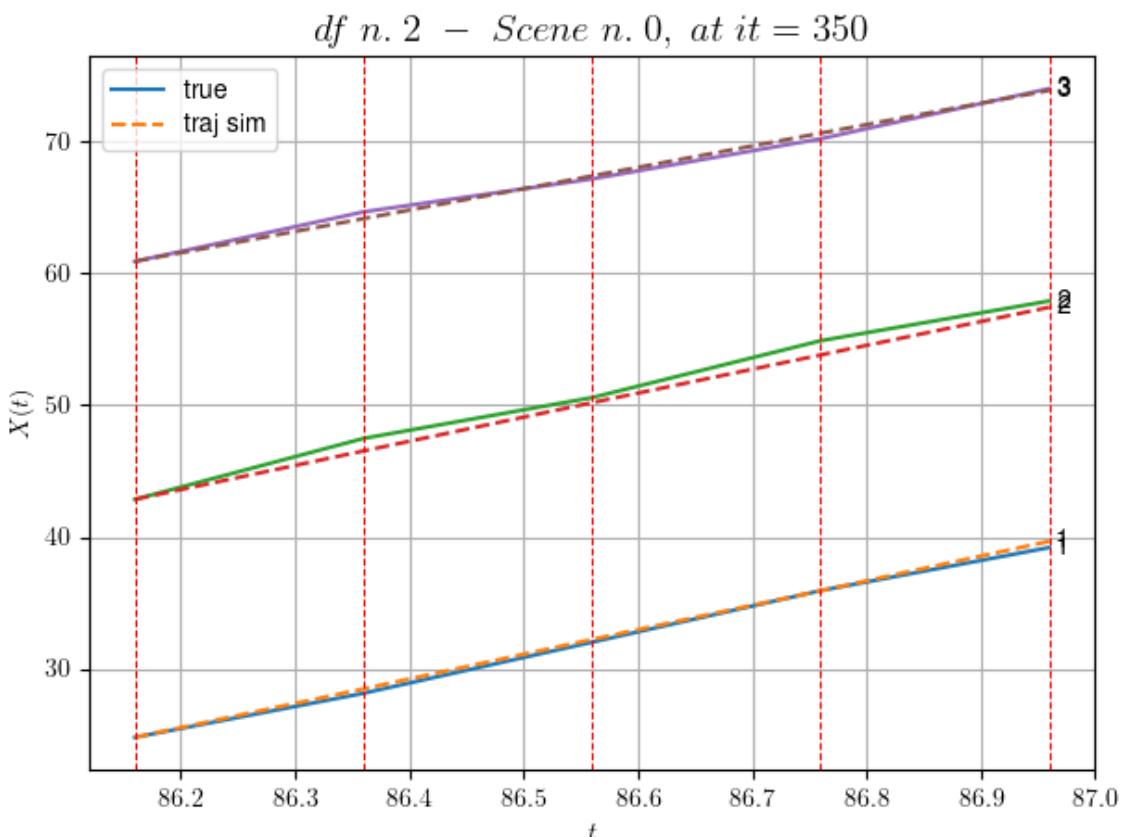
    - Time interval n.1: [86.36, 86.56]
      * y_true: [19.40034801 15.51071286]
      * v_ann: [18.785308837890625, 18.325702667236328, 1
6.235429521340052]

-----
    - Time interval n.2: [86.56, 86.76]
      * y_true: [19.59044325 21.61118084]
      * v_ann: [18.5274715423584, 18.14767074584961, 16.2
35429521340052]

-----
    - Time interval n.3: [86.76, 86.96]
      * y_true: [16.37044892 15.10091945]
      * v_ann: [18.773845672607422, 18.10515785217285, 1
6.235429521340052]

-----
* err= 0.2231139338504856
* Learning rate NN = 4.7829678806010634e-05
* diff = 1.1492654069938935e-05

```



For scene 0/18

```

* use LR_NN=0.0001 with err=15.803779500863522 at it=19
* v0_scn_mean = 17.41515005358986
* MAE = 0.22309177199236654

```

```

- Time interval n.0: [109.36, 109.56]
  * y_true: [28.77160952 15.03115545]
  * v_ann: [22.408296585083008, 22.769113540649414, 2
0.03393071799543]

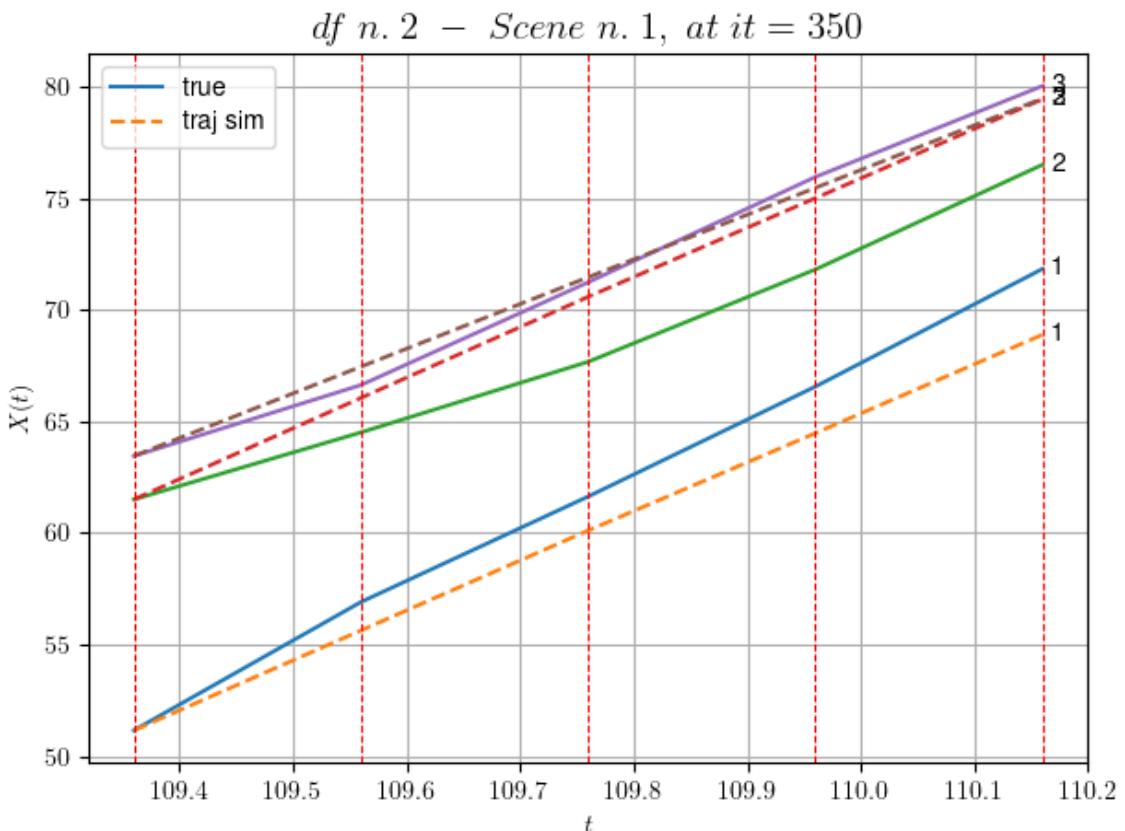
-----
- Time interval n.1: [109.56, 109.76]
  * y_true: [23.64157457 15.83133823]
  * v_ann: [22.383502960205078, 22.659717559814453, 2
0.03393071799543]

-----
- Time interval n.2: [109.76, 109.96]
  * y_true: [24.63196009 20.68195399]
  * v_ann: [21.8165340423584, 22.09976577758789, 20.0
3393071799543]

-----
- Time interval n.3: [109.96, 110.16]
  * y_true: [26.38241903 23.49250056]
  * v_ann: [22.078369140625, 22.188766479492188, 20.0
3393071799543]

* err= 3.1998770842516553
* Learning rate NN = 0.000478296831715852
* diff = 0.0014123495101006078

```



For scene 1/18

\* use LR\_NN=0.001 with err=11.387854086646998 at it=19  
 \* v0\_scn\_mean = 20.888092972897056

\* MAE = 3.1998770842516553

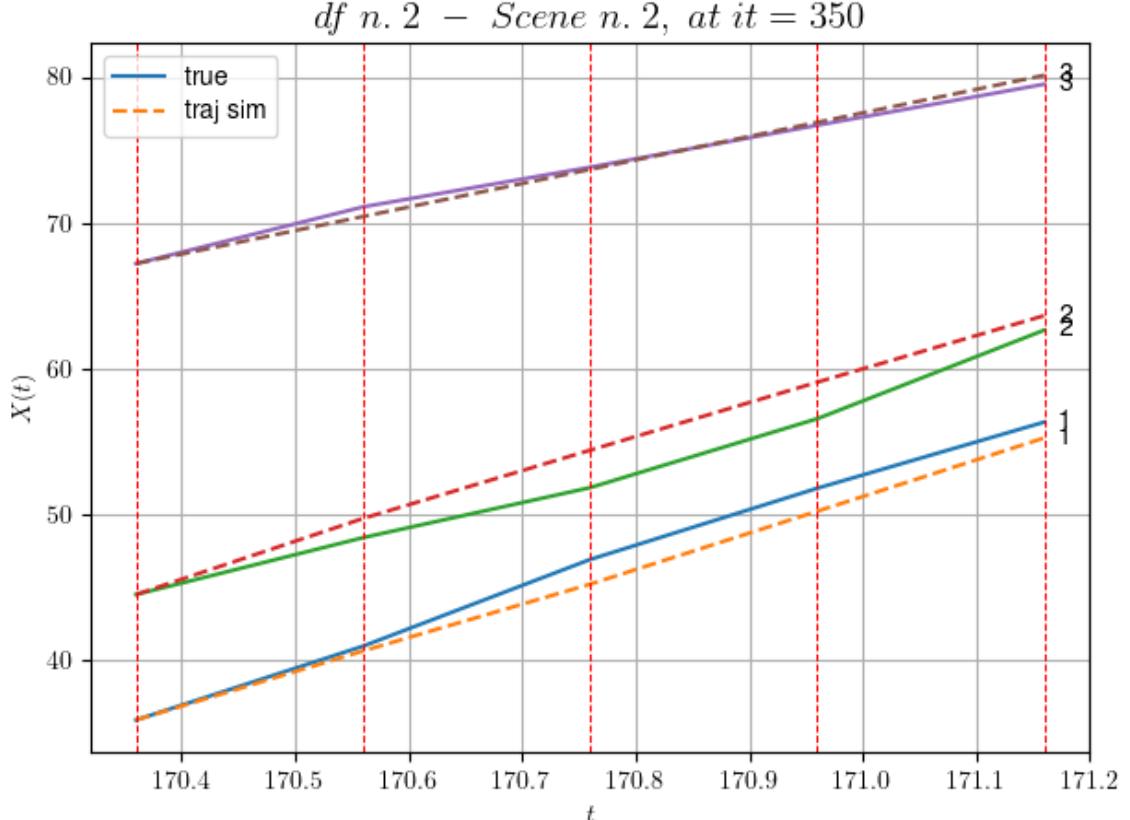
```
=====
=====
- Time interval n.0: [170.36, 170.56]
* y_true: [25.3307413 19.52081588]
* v_ann: [23.689157485961914, 26.102895736694336, 1
6.15170945762333]

-----
-----
- Time interval n.1: [170.56, 170.76]
* y_true: [29.74113537 17.1608437 ]
* v_ann: [22.903430938720703, 23.426074981689453, 1
6.15170945762333]

-----
-----
- Time interval n.2: [170.76, 170.96]
* y_true: [24.43113316 23.6413756 ]
* v_ann: [25.02283477783203, 23.32341766357422, 16.
15170945762333]

-----
-----
- Time interval n.3: [170.96, 171.16]
* y_true: [22.71130298 30.41206279]
* v_ann: [25.172016143798828, 22.85067367553711, 1
6.15170945762333]

-----
-----
* err= 1.5416945561358373
* Learning rate NN = 0.000478296831715852
* diff = 0.00046533172210327933
```



For scene 2/18

```
* use LR_NN=0.001 with err=39.95397507653638 at it=19
* v0_scn_mean = 17.338605388355976
* MAE = 1.5412648750469244
```

---



---

- Time interval n.0: [179.36, 179.56]
  - \* y\_true: [10.36002857 23.43048282]
  - \* v\_ann: [17.218448638916016, 17.744722366333008, 2.082056744021124]
  
- Time interval n.1: [179.56, 179.76]
  - \* y\_true: [10.37004005 22.87060641]
  - \* v\_ann: [17.111539840698242, 17.55780601501465, 2.082056744021124]
  
- Time interval n.2: [179.76, 179.96]
  - \* y\_true: [15.39008451 20.81068862]
  - \* v\_ann: [17.084381103515625, 17.47698211669922, 2.082056744021124]
  
- Time interval n.3: [179.96, 180.16]
  - \* y\_true: [12.44008929 23.53096892]
  - \* v\_ann: [17.243877410888672, 17.722036361694336, 2.082056744021124]

2.082056744021124]

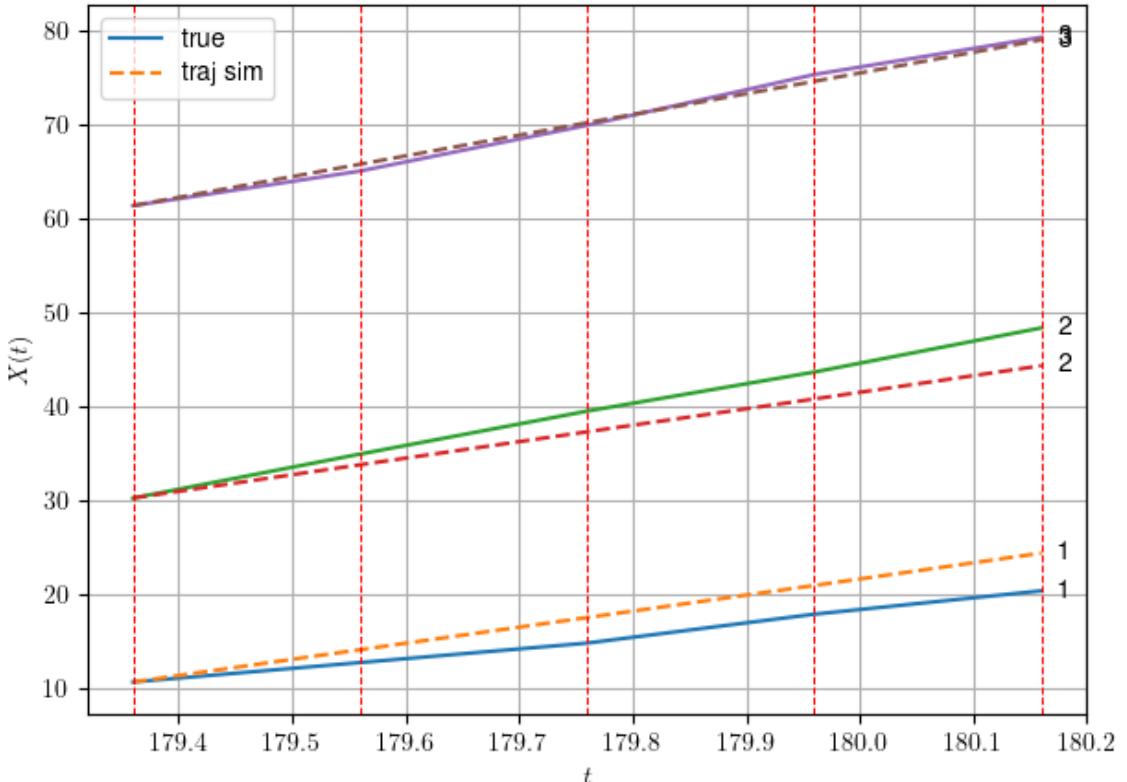
---



---

```
* err= 4.4378347126306705
* Learning rate NN = 4.7829678806010634e-05
* diff = 0.001007250281770048
```

*df n. 2 – Scene n. 3, at it = 350*



For scene 3/18

```
* use LR_NN=0.0001 with err=5.84482906386529 at it=19
* v0_scn_mean = 22.760680188664747
* MAE = 4.021135958404029
```

---



---

- Time interval n.0: [199.76, 199.96]  
\* y\_true: [18.79121443 18.55195156]  
\* v\_ann: [19.79094886779785, 19.086820602416992, 1  
4.651780868496049]

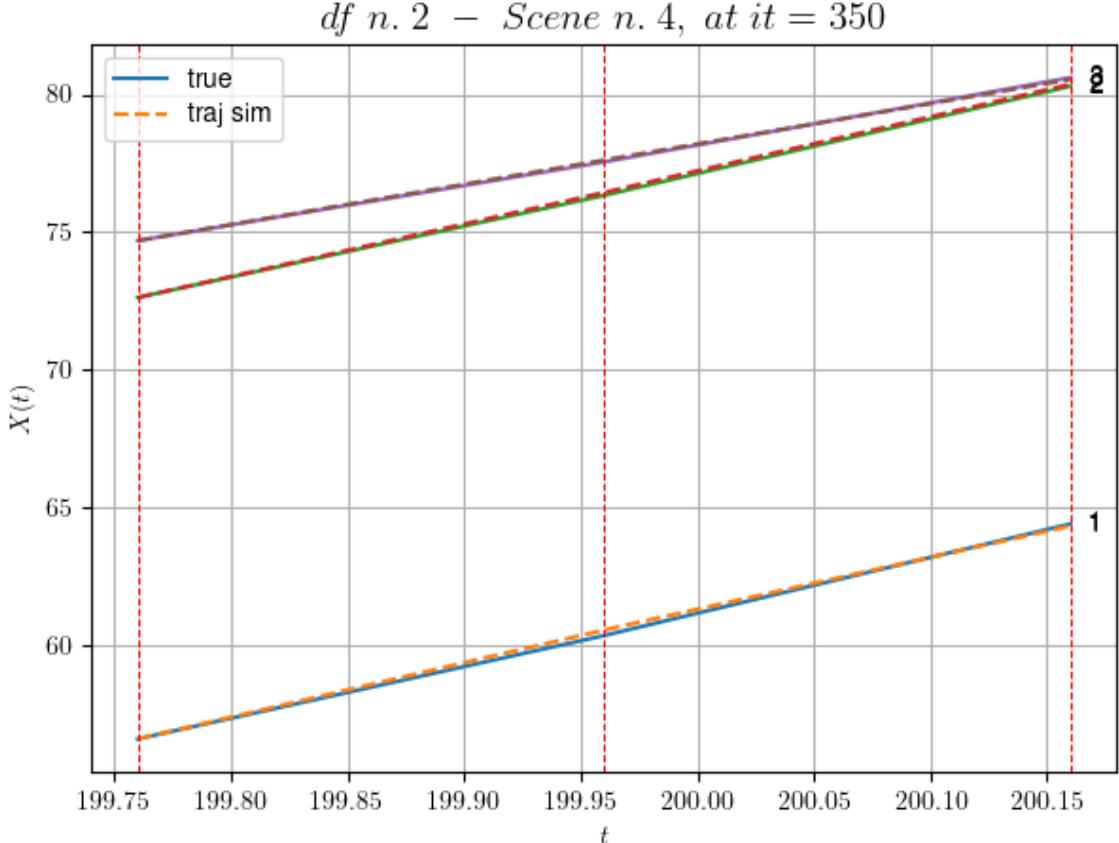
- Time interval n.1: [199.96, 200.16]  
\* y\_true: [20.30155709 19.85230976]  
\* v\_ann: [18.912792205810547, 19.683435440063477, 1  
4.651780868496049]

---



---

```
* err= 0.008070623368582565
* Learning rate NN = 0.0007289999630302191
* diff = 2.6659496440343752e-05
```



For scene 4/18

- \* use LR\_NN=0.001 with err=8.676435477701721 at it=19
- \* v0\_scn\_mean = 15.967231232237879
- \* MAE = 0.008070623368582565

---



---

- Time interval n.0: [212.56, 212.76]
- \* y\_true: [14.43013055 12.85042103]
- \* v\_ann: [15.613397598266602, 17.19020652770996, 2  
0.507203914763075]

---



---

- Time interval n.1: [212.76, 212.96]
- \* y\_true: [10.79011916 33.80137312]
- \* v\_ann: [15.413511276245117, 17.521343231201172, 2  
0.507203914763075]

---



---

- Time interval n.2: [212.96, 213.16]
- \* y\_true: [16.24022861 13.70067627]
- \* v\_ann: [16.58785057067871, 17.295045852661133, 2  
0.507203914763075]

---



---

- Time interval n.3: [213.16, 213.36]
- \* y\_true: [10.73017559 21.10118973]
- \* v\_ann: [16.362783432006836, 16.988670349121094, 2

0.507203914763075]

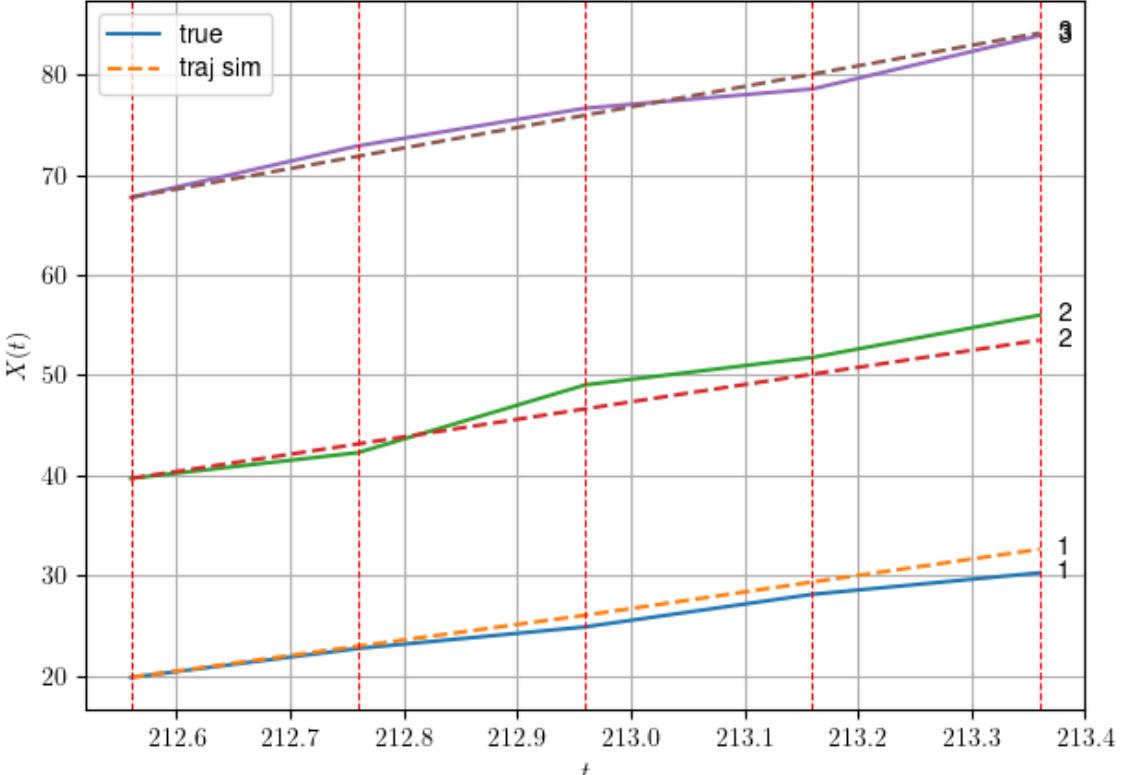
---



---

- \* err= 1.8505948898222775
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 0.0016842475638902954

*df n. 2 – Scene n. 5, at it = 350*



For scene 5/18

- \* use LR\_NN=5e-05 with err=8.76268162513984 at it=19
- \* v0\_scn\_mean = 21.320803326933362
- \* MAE = 1.8259646572992259

---



---

- Time interval n.0: [318.16, 318.36]
- \* y\_true: [13.01007537 20.36054455]
- \* v\_ann: [16.178762435913086, 17.40707778930664, 2 0.355267320886874]

---



---

- Time interval n.1: [318.36, 318.56]
- \* y\_true: [14.27010639 20.89068863]
- \* v\_ann: [16.31028175354004, 17.432004928588867, 2 0.355267320886874]

---



---

- Time interval n.2: [318.56, 318.76]
- \* y\_true: [12.16011799 21.20084683]
- \* v\_ann: [16.569555282592773, 17.517545700073242, 2

0.355267320886874]

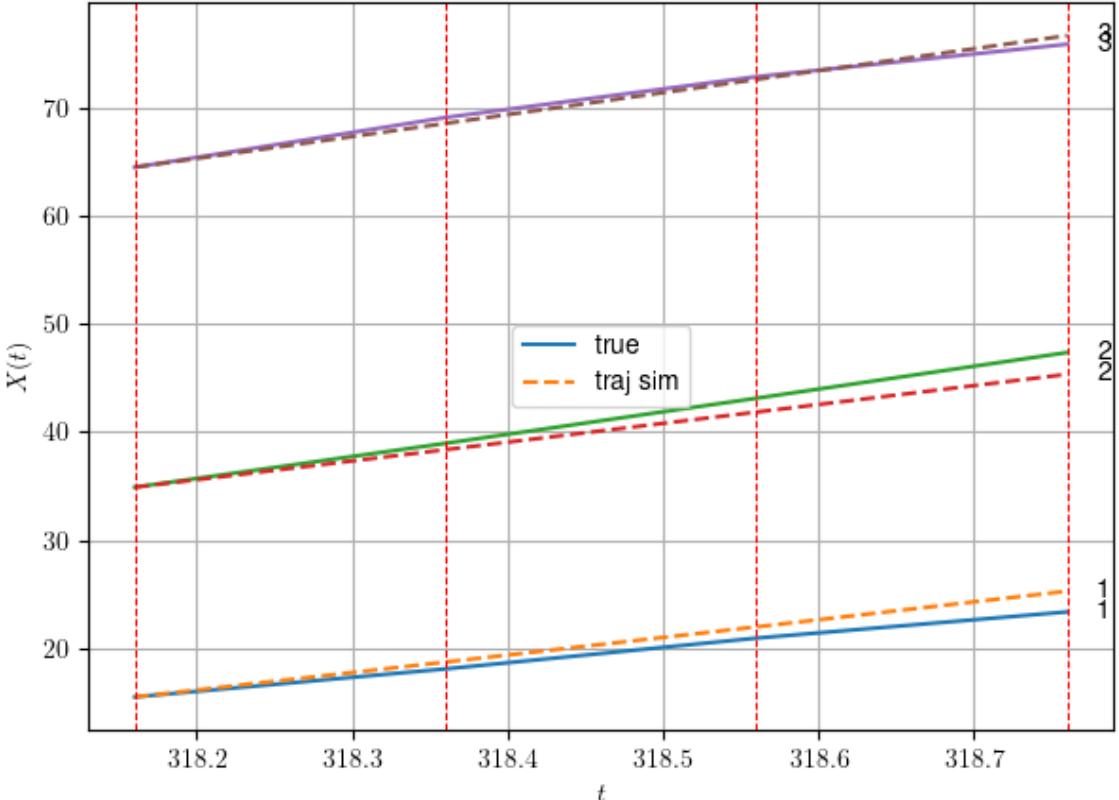
---



---

```
* err= 1.0223750253641788
* Learning rate NN = 5.904899080633186e-05
* diff = 0.0025202847163072686
```

*df n. 2 – Scene n. 6, at it = 350*



For scene 6/18

```
* use LR_NN=0.0001 with err=4.949808227640223 at it=19
* v0_scn_mean = 21.181888768119585
* MAE = 0.9432947291645936
```

---



---

```
- Time interval n.0: [430.16, 430.36]
  * y_true: [15.83005748 20.27065425]
  * v_ann: [18.820581436157227, 18.671600341796875, 2
1.236966061391445]
```

---



---

```
- Time interval n.1: [430.36, 430.56]
  * y_true: [19.99011659 24.33092793]
  * v_ann: [18.926067352294922, 18.873821258544922, 2
1.236966061391445]
```

---



---

```
- Time interval n.2: [430.56, 430.76]
  * y_true: [14.67011767 20.05093433]
  * v_ann: [19.390119552612305, 18.840057373046875, 2
```

1.236966061391445]

---

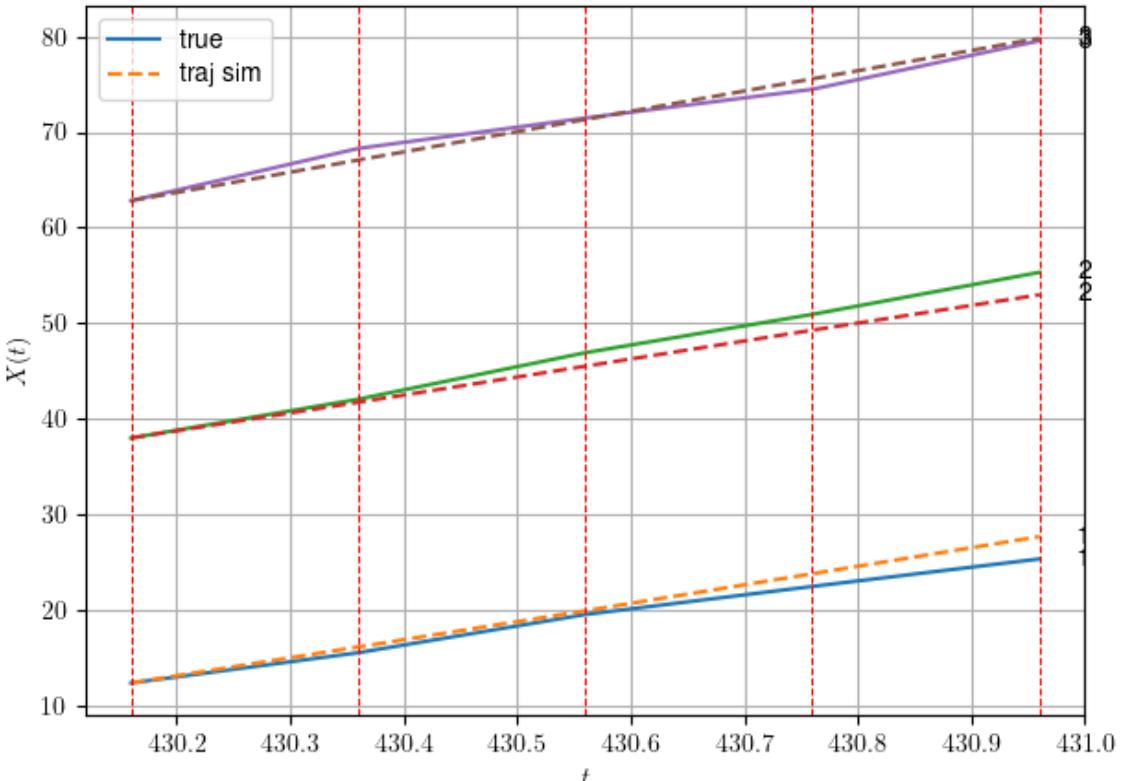
- Time interval n.3: [430.76, 430.96]
  - \* y\_true: [14.38015429 21.97121967]
  - \* v\_ann: [19.430736541748047, 18.501188278198242, 2

1.236966061391445]

---

- \* err= 1.3899417923429425
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 1.6017213558594534e-05

*df n. 2 – Scene n. 7, at it = 350*



For scene 7/18

- \* use LR\_NN=5e-05 with err=8.628956546604075 at it=19
- \* v0\_scn\_mean = 21.988019723269552
- \* MAE = 1.3898987495297013

---



---



---



---

- Time interval n.0: [435.96, 436.16]
  - \* y\_true: [15.85107698 23.95169404]
  - \* v\_ann: [19.838573455810547, 22.178483963012695, 2

1.458777210396725]

---



---



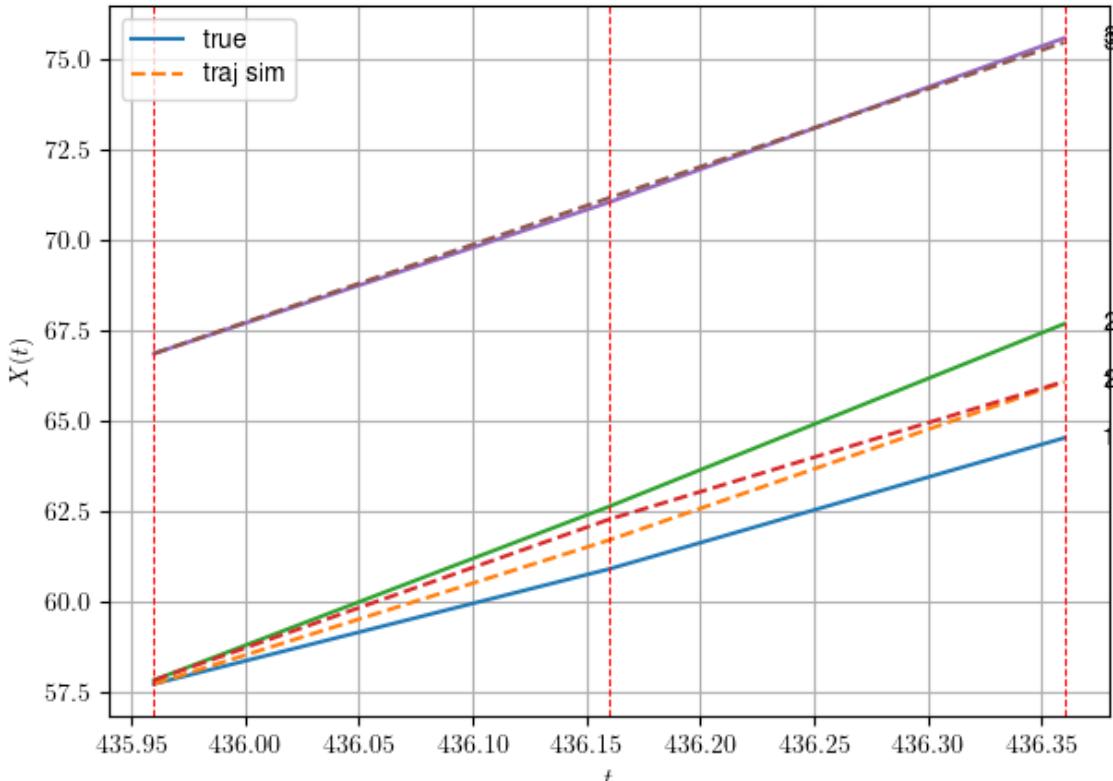
---

- Time interval n.1: [436.16, 436.36]
  - \* y\_true: [18.0813972 25.19206379]
  - \* v\_ann: [21.792526245117188, 19.012710571289062, 2

1.458777210396725]

```
* err= 0.6323057461589223
* Learning rate NN = 0.0036449995823204517
* diff = 3.593134929469333e-05
```

*df n. 2 – Scene n. 8, at it = 350*



For scene 8/18

```
* use LR_NN=0.005 with err=2.1825080287104583 at it=19
* v0_scn_mean = 22.19082009622671
* MAE = 0.6207961909538439
```

---



---

- Time interval n.0: [442.76, 442.96]  
 \* y\_true: [18.06141662 13.31057742]  
 \* v\_ann: [19.912296295166016, 18.972076416015625, 2  
 2.775949002661733]

---



---



---

- Time interval n.1: [442.96, 443.16]  
 \* y\_true: [20.34015276 11.01053508]  
 \* v\_ann: [19.131650924682617, 18.5949649810791, 22.  
 775949002661733]

---



---



---

- Time interval n.2: [443.16, 443.36]  
 \* y\_true: [26.42894929 13.47072378]  
 \* v\_ann: [18.49320411682129, 18.268491744995117, 2  
 2.775949002661733]

```

-----  

-----  

    - Time interval n.3: [443.36, 443.56]  

      * y_true: [22.70036274 15.67093348]  

      * v_ann: [18.68843650817871, 18.422269821166992, 2  

2.775949002661733]

```

```

-----  

-----  

    - Time interval n.4: [443.56, 443.76]  

      * y_true: [30.60068675 16.84112333]  

      * v_ann: [18.73967170715332, 18.517213821411133, 2  

2.775949002661733]

```

```

-----  

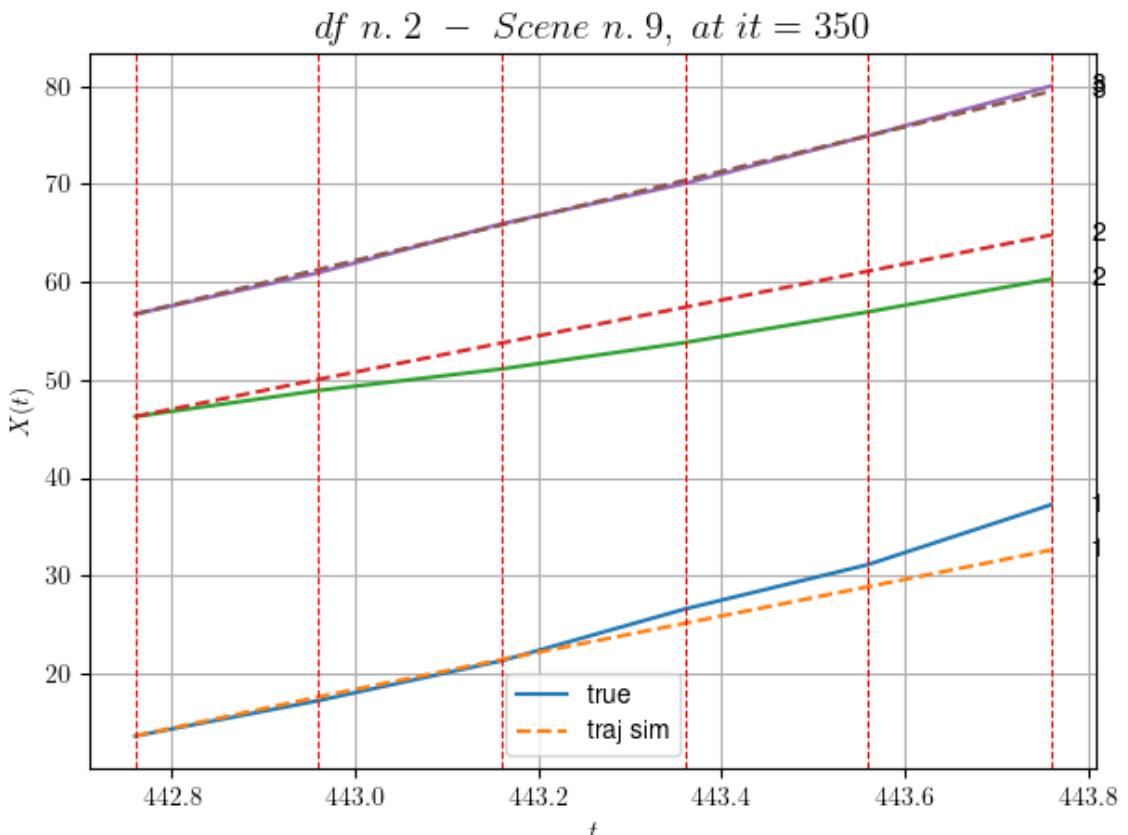
-----  

      * err= 4.899618842273533  

      * Learning rate NN = 3.874203684972599e-05  

      * diff = 0.005101620700000006

```



For scene 9/18

```

* use LR_NN=0.0001 with err=8.016847119385167 at it=19
* v0_scn_mean = 23.395100998780624
* MAE = 4.6011400773019195

```

```

=====  

=====  

    - Time interval n.0: [487.56, 487.76]  

      * y_true: [22.90018755 16.61065196]  

      * v_ann: [20.8248348236084, 20.409500122070312, 21.  

111964471908973]

```

```

-----  

- Time interval n.1: [487.76, 487.96]  

  * y_true: [21.00025249 21.71102285]  

  * v_ann: [20.563331604003906, 20.35887336730957, 2  

  1.111964471908973]
-----
```

```

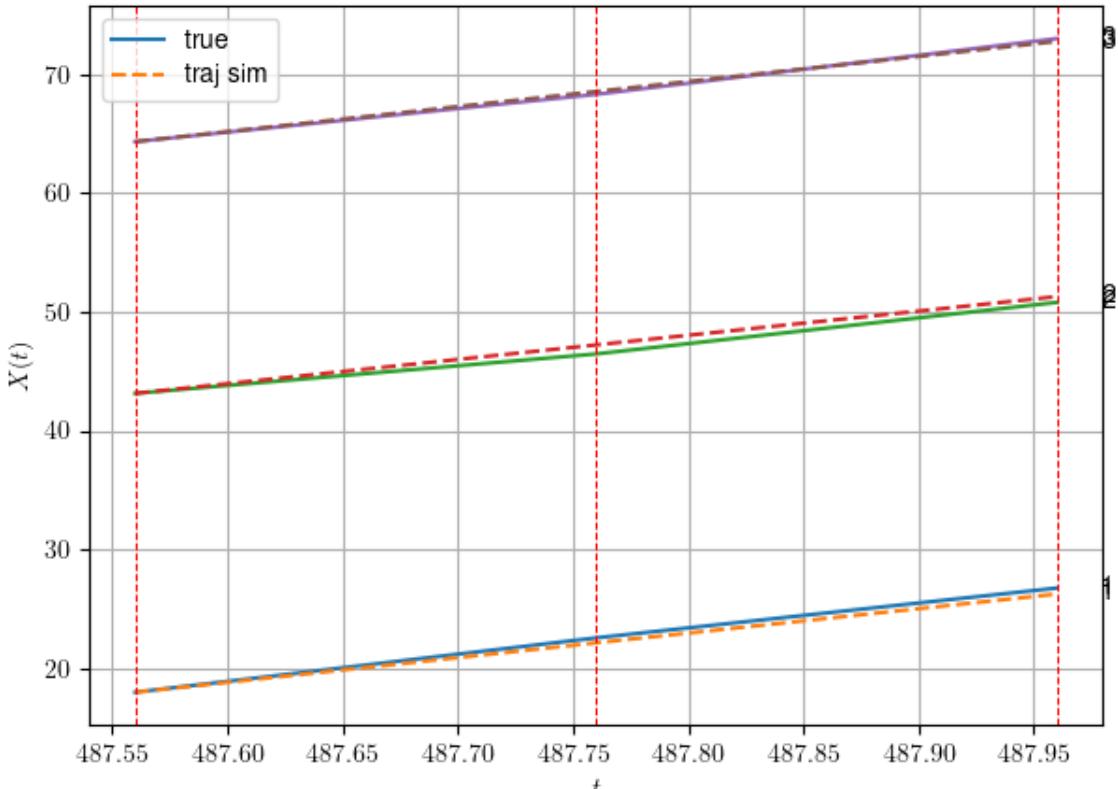
-----  

* err= 0.15095642088352457  

* Learning rate NN = 3.6449993785936385e-05  

* diff = 1.688617501285905e-05
-----
```

*df n. 2 – Scene n. 10, at it = 350*



For scene 10/18

```

* use LR_NN=5e-05 with err=1.6952172763253337 at it=19  

* v0_scn_mean = 21.873731649468603  

* MAE = 0.14932109071468663
=====
```

```

-----  

- Time interval n.0: [531.76, 531.96]  

  * y_true: [23.26110286 19.80102444]  

  * v_ann: [21.392045974731445, 22.203899383544922, 1  

  7.911818675880006]
-----
```

```

-----  

- Time interval n.1: [531.96, 532.16]  

  * y_true: [19.37730225 14.13461647]  

  * v_ann: [21.367565155029297, 20.69667625427246, 1  

  7.911818675880006]
-----
```

```

-----  

-----  

    - Time interval n.2: [532.16, 532.36]  

      * y_true: [16.15104075 20.18132342]  

      * v_ann: [19.1644287109375, 20.67190933227539, 17.9  

11818675880006]

```

```

-----  

-----  

    - Time interval n.3: [532.36, 532.56]  

      * y_true: [21.60157988 27.91216632]  

      * v_ann: [20.48655891418457, 20.27309226989746, 17.  

911818675880006]

```

```

-----  

-----  

    - Time interval n.4: [532.56, 532.76]  

      * y_true: [19.65163525 25.90233391]  

      * v_ann: [20.97115707397461, 20.6614990234375, 17.9  

11818675880006]

```

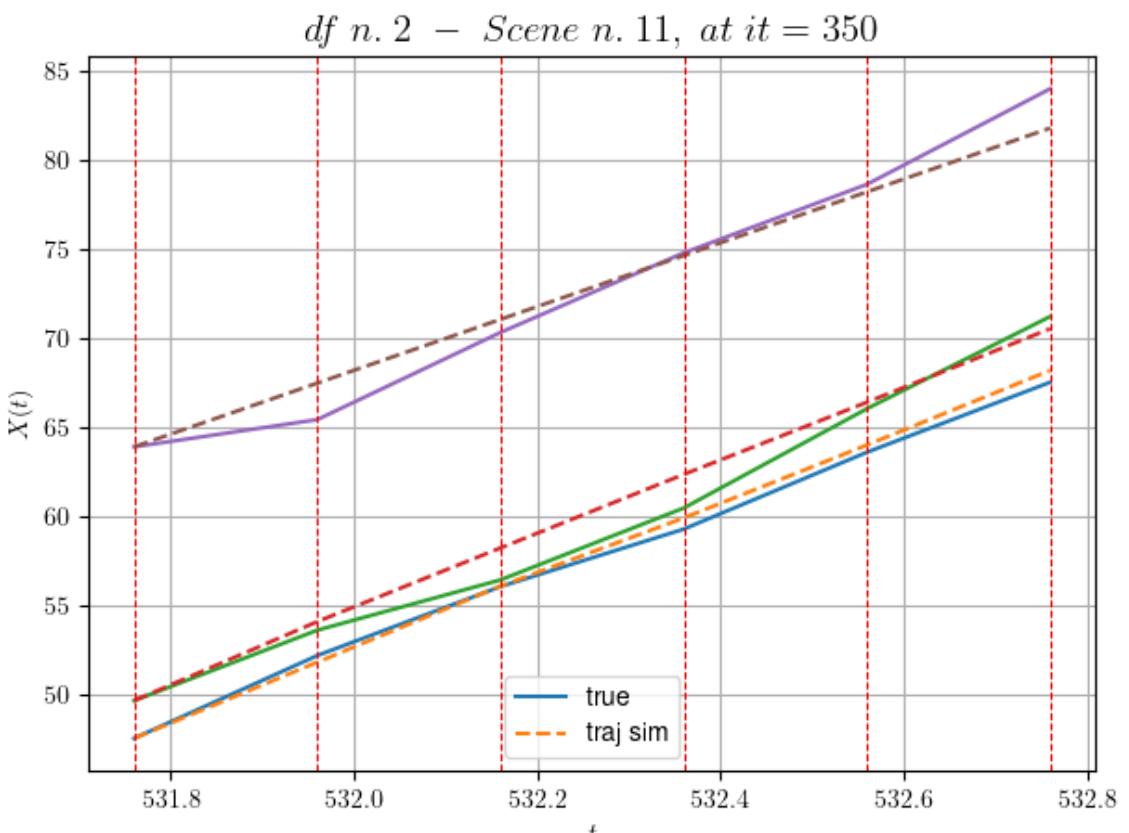
```

* err= 1.0335195929265815  

* Learning rate NN = 0.0003874204121530056  

* diff = 0.00013879161954033492

```



For scene 11/18

```

* use LR_NN=0.001 with err=20.931056883436284 at it=19  

* v0_scn_mean = 18.94786086315595  

* MAE = 1.0143846637783114

```

```

    - Time interval n.0: [538.36, 538.56]
      * y_true: [17.69068154 17.20117669]
      * v_ann: [21.718183517456055, 20.557126998901367, 2
1.518930627751246]

-----
    - Time interval n.1: [538.56, 538.76]
      * y_true: [18.89091077 18.60142936]
      * v_ann: [20.00408935546875, 19.844125747680664, 2
1.518930627751246]

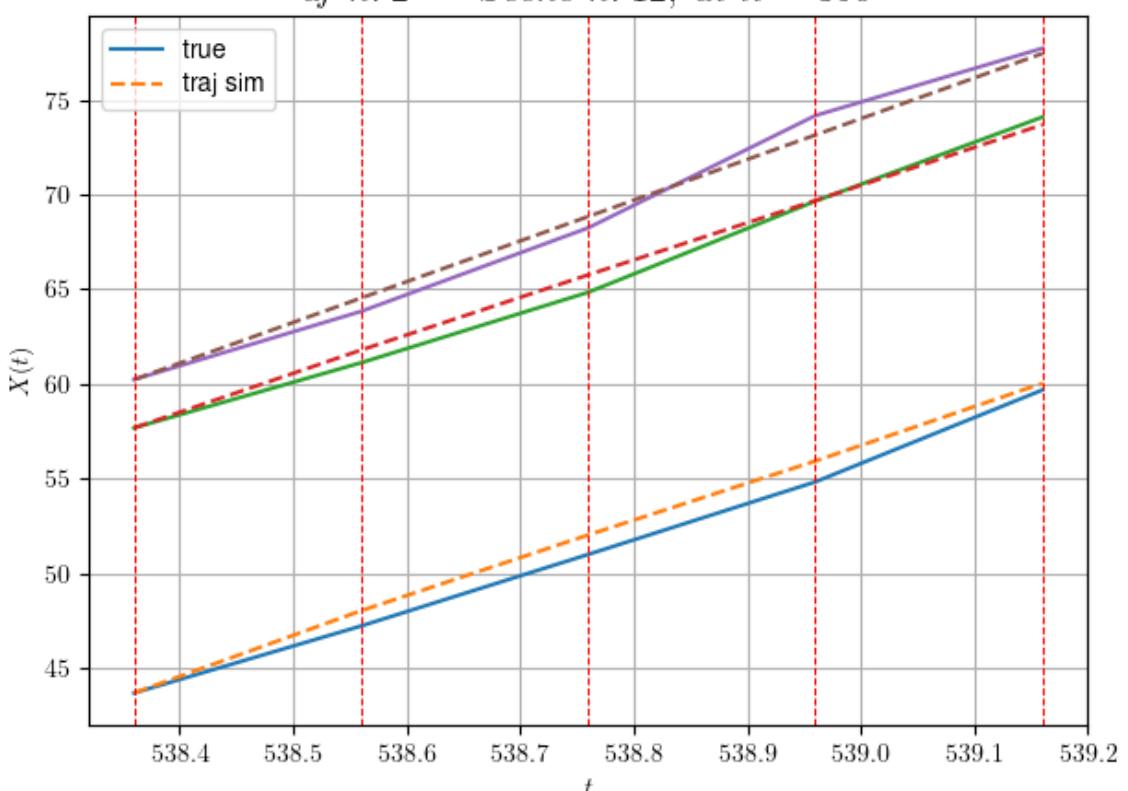
-----
    - Time interval n.2: [538.76, 538.96]
      * y_true: [19.15102468 24.05210496]
      * v_ann: [19.50971221923828, 19.626327514648438, 2
1.518930627751246]

-----
    - Time interval n.3: [538.96, 539.16]
      * y_true: [24.26158149 22.202218 ]
      * v_ann: [20.529422760009766, 20.010784149169922, 2
1.518930627751246]

-----
* err= 0.4322412895232064
* Learning rate NN = 0.000478296831715852
* diff = 1 740232881662842240.05

```

*df n. 2 – Scene n. 12, at it = 350*



For scene 12/18

\* use LR\_NN=0.001 with err=17.89493556531907 at it=19

\* v0\_scn\_mean = 22.245817942497073

\* MAE = 0.43221975309277

=====

=====

- Time interval n.0: [541.16, 541.36]

\* y\_true: [22.67086863 28.23390149]

\* v\_ann: [25.506168365478516, 25.113435745239258, 20.490059693196088]

-----

- Time interval n.1: [541.36, 541.56]

\* y\_true: [19.45088023 23.11862329]

\* v\_ann: [24.14396095275879, 24.3797664642334, 20.490059693196088]

-----

- Time interval n.2: [541.56, 541.76]

\* y\_true: [24.96136667 24.68114114]

\* v\_ann: [22.79239845275879, 22.55402183532715, 20.490059693196088]

-----

- Time interval n.3: [541.76, 541.96]

\* y\_true: [23.96154506 23.41644837]

\* v\_ann: [23.195083618164062, 22.790061950683594, 20.490059693196088]

-----

- Time interval n.4: [541.96, 542.16]

\* y\_true: [22.22167267 29.9460798 ]

\* v\_ann: [23.431297302246094, 22.947830200195312, 20.490059693196088]

-----

- Time interval n.5: [542.16, 542.36]

\* y\_true: [16.91142821 23.23526684]

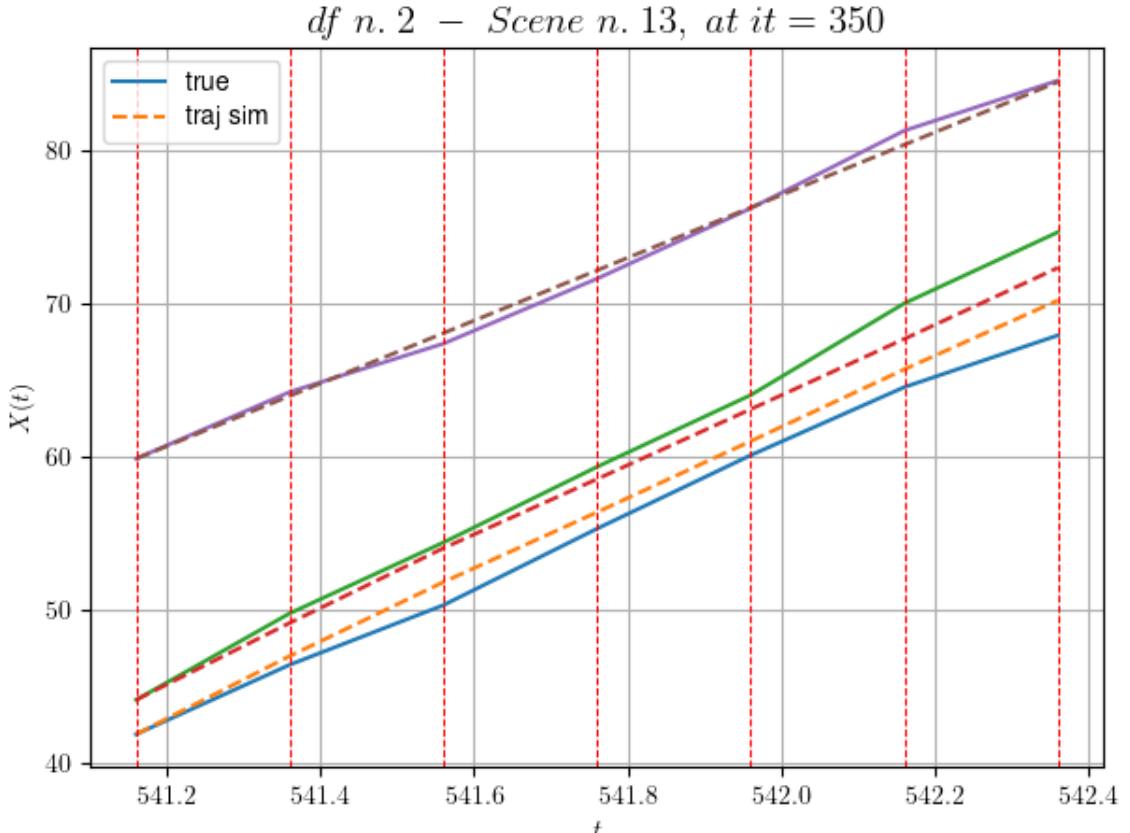
\* v\_ann: [22.53061294555664, 23.22434425354004, 20.490059693196088]

-----

\* err= 1.2215064947860774

\* Learning rate NN = 0.00031381050939671695

\* diff = 0.0005772402864663295



For scene 13/18

```
* use LR_NN=0.001 with err=27.81616410307376 at it=19
* v0_scn_mean = 21.305128485774617
* MAE = 1.2040419663254802
```

---



---

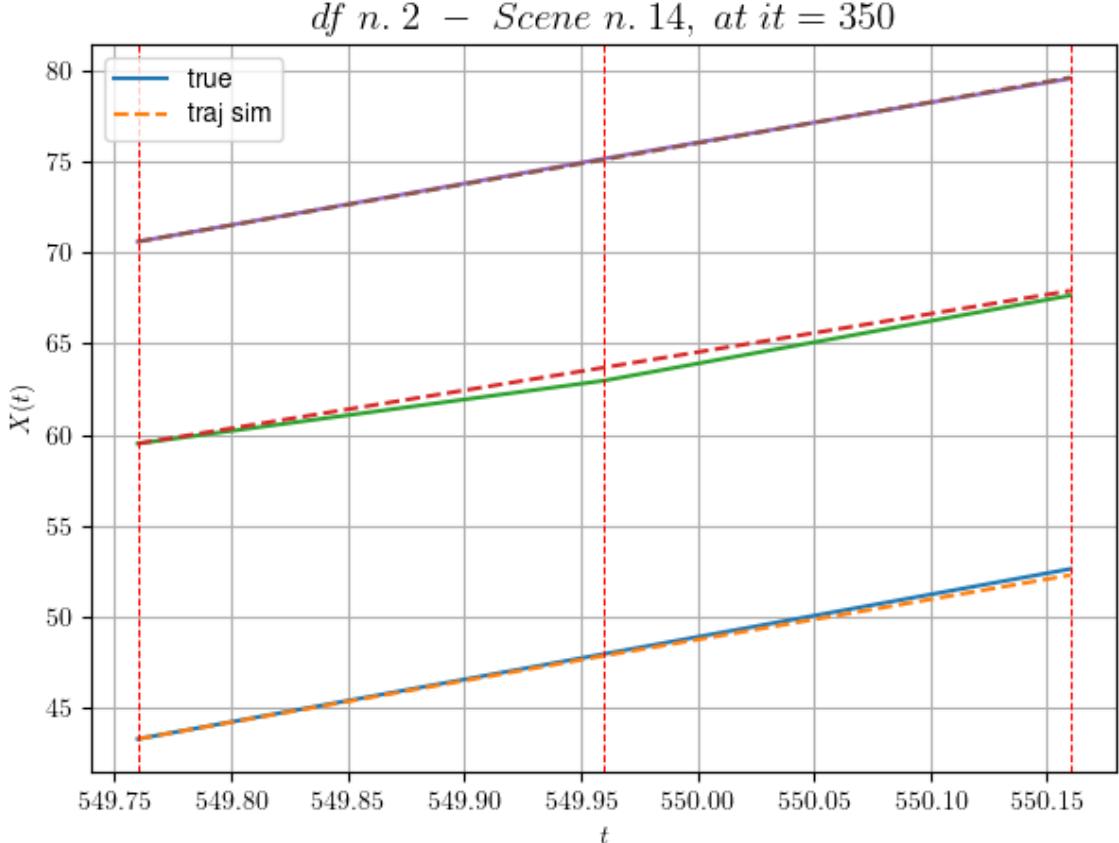
```
- Time interval n.0: [549.76, 549.96]
* y_true: [23.30098965 17.25125335]
* v_ann: [22.806833267211914, 20.846677780151367, 2
2.49577375007867]
```

---

```
- Time interval n.1: [549.96, 550.16]
* y_true: [23.30098965 23.35192881]
* v_ann: [22.103351593017578, 21.03853416442871, 2
2.49577375007867]
```

---

```
* err= 0.07929490886965322
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00040893848814121947
```



For scene 14/18

- \* use LR\_NN=0.0001 with err=1.39037235078259 at it=19
- \* v0\_scn\_mean = 23.138938736550163
- \* MAE = 0.06923942523635589

---



---

For scene 15/18

- \* use LR\_NN=0.0001 with err=0.8373547821401924 at it=19
- \* v0\_scn\_mean = 25.04720642895467
- \* MAE = 0.0640252677528759

---



---

- Time interval n.0: [87.56, 87.76]
  - \* y\_true: [20.56019483 17.07029985 18.3510221 ]
  - \* v\_ann: [19.578567504882812, 20.727632522583008, 19.507320404052734, 23.400041684740113]

---



---

- Time interval n.1: [87.76, 87.96]
  - \* y\_true: [21.72029145 17.49039467 19.46124504 ]
  - \* v\_ann: [19.096960067749023, 18.886720657348633, 18.271263122558594, 23.400041684740113]

---



---

- Time interval n.2: [87.96, 88.16]

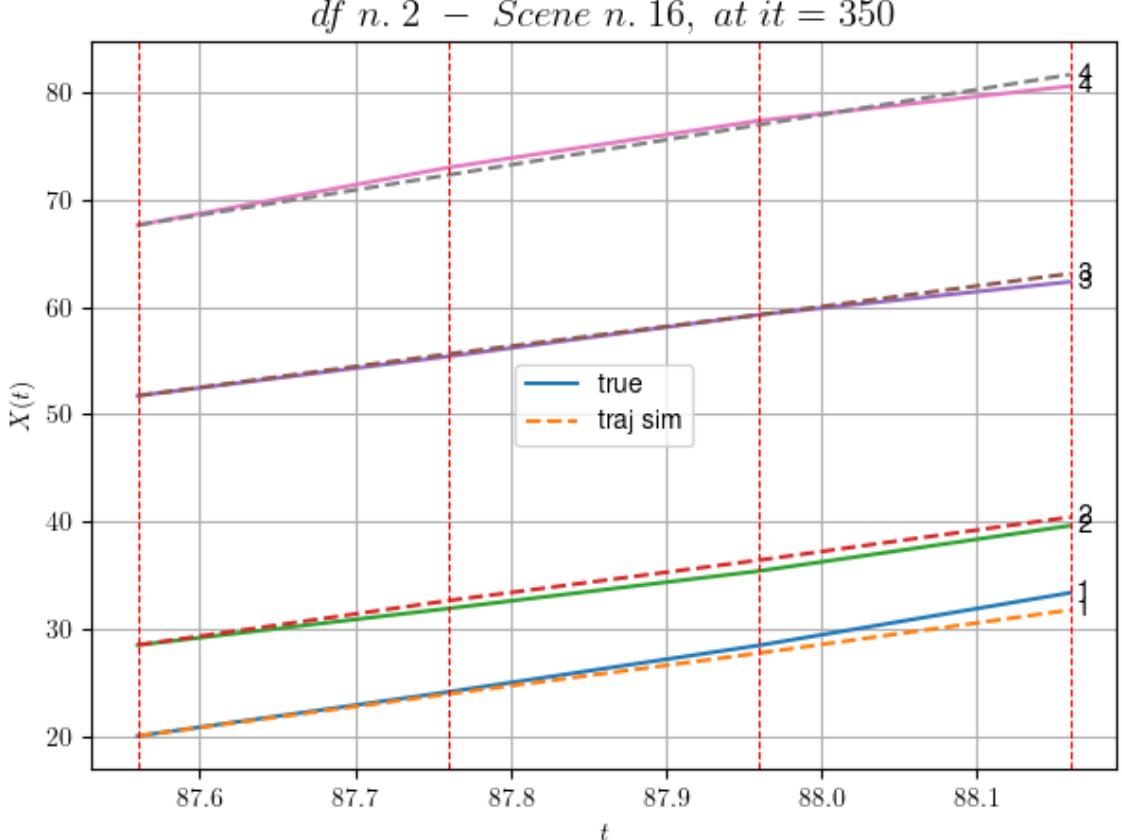
```
* y_true: [24.51045762 21.12058621 15.36109554]
* v_ann: [20.09650993347168, 20.07390785217285, 19.
21587371826172, 23.400041684740113]
```

---



---

```
* err= 0.48525120994741644
* Learning rate NN = 0.0005904899444431067
* diff = 6.382688528505653e-05
```



For scene 16/18

```
* use LR_NN=0.001 with err=8.717889579562057 at it=19
* v0_scn_mean = 24.153365501346677
* MAE = 0.48003808590248365
```

---



---

For scene 17/18

```
* use LR_NN=0.0001 with err=5.406922623395413 at it=19
* v0_scn_mean = 15.658848893318348
* MAE = 0.02715126267058749
```

---



---

For df=2 with 18 scenes, time taken: 188.81

---



---

```
*****
*****
```

In df n.3/10 we have 55 scenes

---



---

\*\*\*\*\*

\*\*\*\*\*

- Time interval n.0: [16.16, 16.36]

\* y\_true: [27.36596872 40.6089382 ]

\* v\_ann: [24.302448272705078, 23.80446434020996, 3  
9.227215112044]

---



---

- Time interval n.1: [16.36, 16.56]

\* y\_true: [22.16572117 32.62072047]

\* v\_ann: [33.89365768432617, 31.924535751342773, 3  
9.227215112044]

---



---

- Time interval n.2: [16.56, 16.76]

\* y\_true: [24.04131334 24.91936545]

\* v\_ann: [28.02539825439453, 25.695842742919922, 3  
9.227215112044]

---



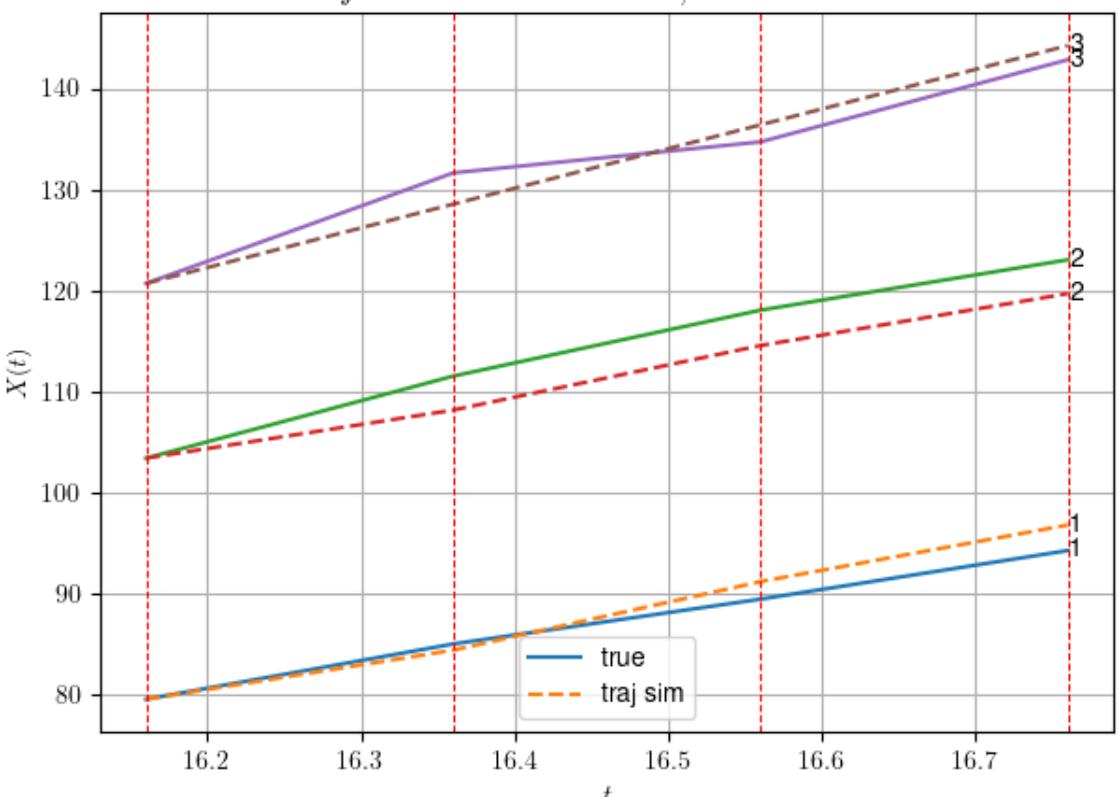
---

\* err= 4.906531231938755

\* Learning rate NN = 0.0002952449722215533

\* diff = 0.007738288123219306

*df n. 3 – Scene n. 0, at it = 350*



For scene 0/55

\* use LR\_NN=0.0005 with err=13.258774076892843 at it=19

\* v0\_scn\_mean = 38.436377857801986

\* MAE = 4.906531231938755

---



---

=====

For scene 1/55

\* use LR\_NN=0.0001 with err=9.930538929796525 at it=19  
\* v0\_scn\_mean = 36.46079988030287  
\* MAE = 0.8616708620407237

=====

- Time interval n.0: [23.96, 24.16]  
\* y\_true: [31.9527567 21.95230333]  
\* v\_ann: [24.179954528808594, 25.37143325805664, 2  
7.016685910779742]

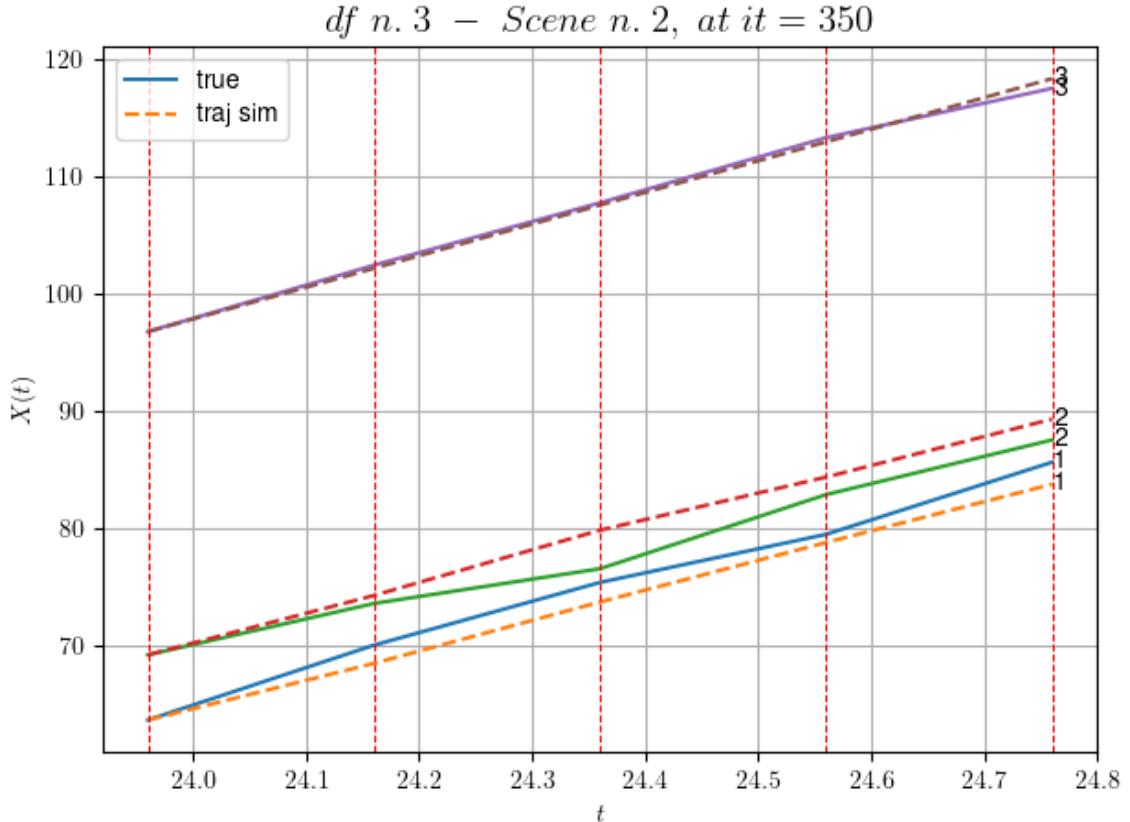
- Time interval n.1: [24.16, 24.36]  
\* y\_true: [26.79271708 14.85171745]  
\* v\_ann: [26.229263305664062, 27.87713623046875, 2  
7.016685910779742]

- Time interval n.2: [24.36, 24.56]  
\* y\_true: [20.5424093 31.65411216]  
\* v\_ann: [25.39090347290039, 22.681074142456055, 2  
7.016685910779742]

- Time interval n.3: [24.56, 24.76]  
\* y\_true: [30.8240747 23.35345154]  
\* v\_ann: [24.90959930419922, 24.780330657958984, 2  
7.016685910779742]

-

\* err= 1.7891008887296629  
\* Learning rate NN = 0.000478296831715852  
\* diff = 0.000725508835182298



For scene 2/55

- \* use LR\_NN=0.001 with err=26.597031999863916 at it=19
- \* v0\_scn\_mean = 27.272376917677466
- \* MAE = 1.7863664692236194

---



---

- Time interval n.0: [42.96, 43.16]
  - \* y\_true: [34.44093898 36.40531345]
  - \* v\_ann: [24.928321838378906, 24.850759506225586, 27.35069258451141]

---

- Time interval n.1: [43.16, 43.36]
  - \* y\_true: [27.09071898 44.10770887]
  - \* v\_ann: [34.13570785522461, 32.03287124633789, 27.35069258451141]

---

- Time interval n.2: [43.36, 43.56]
  - \* y\_true: [24.51583897 25.2301032 ]
  - \* v\_ann: [38.770931243896484, 30.075815200805664, 27.35069258451141]

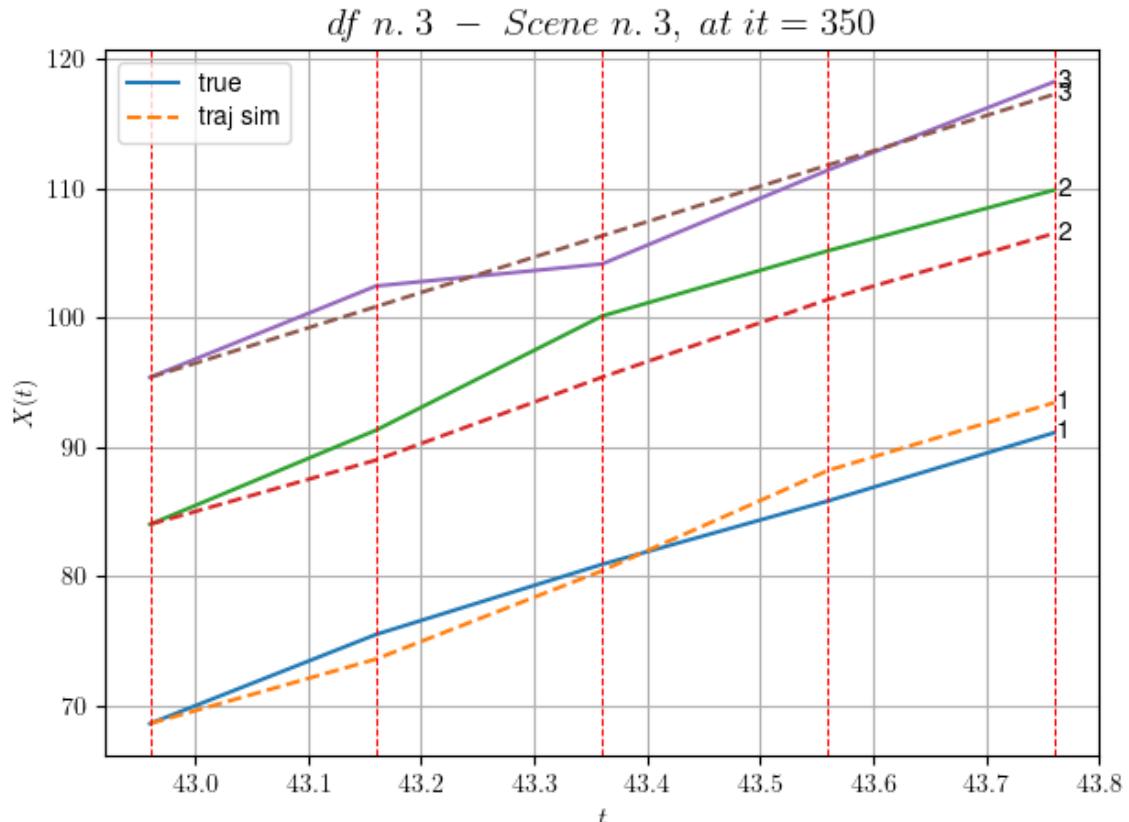
---

- Time interval n.3: [43.56, 43.76]
  - \* y\_true: [26.35394512 23.45522926]
  - \* v\_ann: [26.20341682434082, 25.505260467529297, 27.35069258451141]

```

* err= 5.0777227501919615
* Learning rate NN = 0.000478296831715852
* diff = 0.006331572407465735

```



For scene 3/55

```

* use LR_NN=0.001 with err=21.56319687397216 at it=19
* v0_scn_mean = 27.577756869527697
* MAE = 4.283547021307496

```

```

- Time interval n.0: [61.76, 61.96]
  * y_true: [28.79377133 7.10177762]
  * v_ann: [29.156003952026367, 28.979339599609375, 2
  7.830106096169622]

```

```

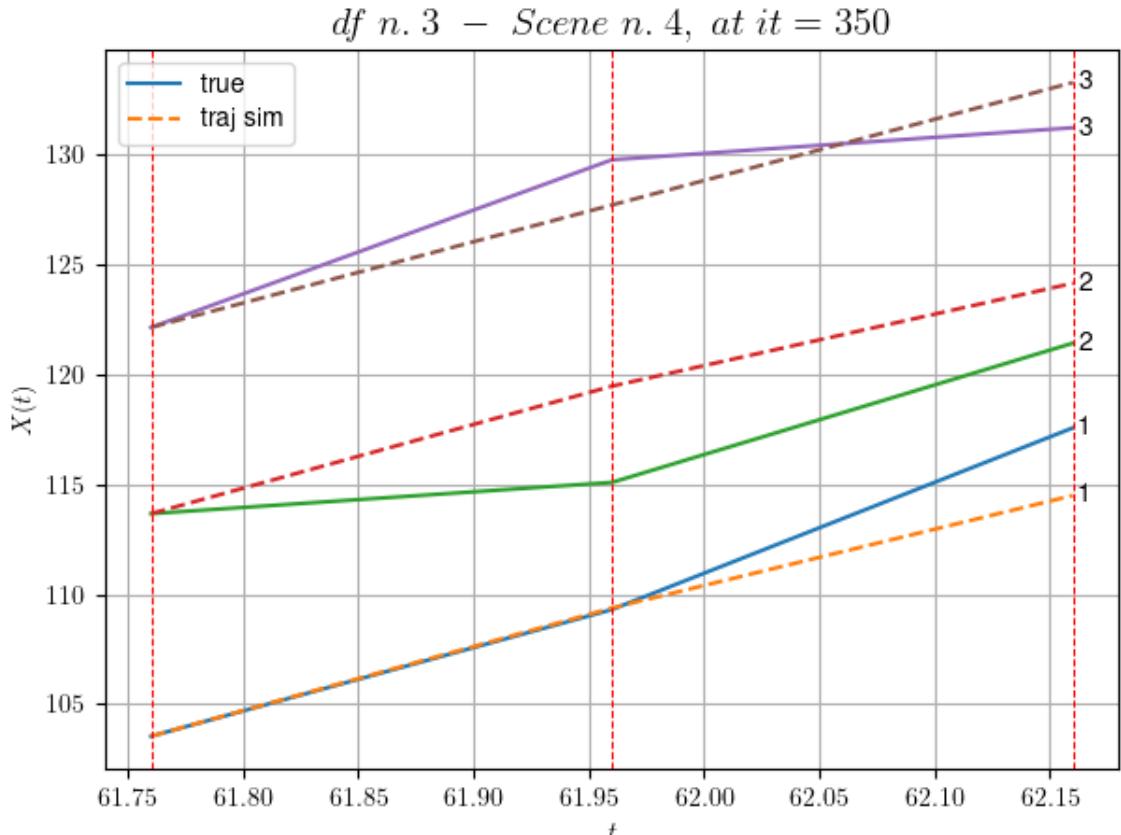
- Time interval n.1: [61.96, 62.16]
  * y_true: [41.29768472 31.64601894]
  * v_ann: [25.569509506225586, 23.382627487182617, 2
  7.830106096169622]

```

```

* err= 4.939671573077294
* Learning rate NN = 0.0007289999630302191
* diff = 0.016304073720642798

```



For scene 4/55

- \* use LR\_NN=0.001 with err=7.324420816376825 at it=19
- \* v0\_scn\_mean = 28.01608127026752
- \* MAE = 4.939671573077294

---



---

- Time interval n.0: [63.76, 63.96]
- \* y\_true: [39.33120973 30.97229006]
- \* v\_ann: [33.68941879272461, 25.894834518432617, 3 3.839854928033795]

---



---

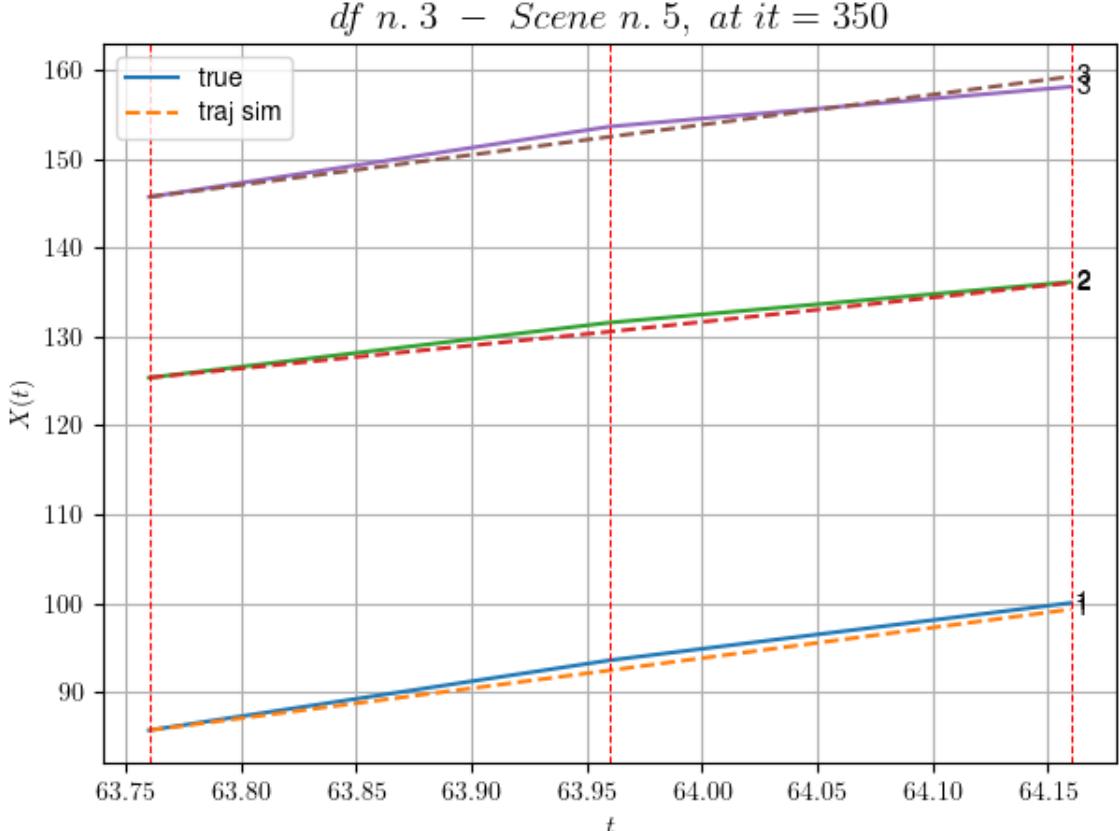
- Time interval n.1: [63.96, 64.16]
- \* y\_true: [32.2308074 22.86038312]
- \* v\_ann: [34.27445602416992, 27.340991973876953, 3 3.839854928033795]

---



---

- \* err= 0.6067194594185157
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 0.0010225330042420433



For scene 5/55

- \* use LR\_NN=5e-05 with err=2.1025748232972963 at it=19
- \* v0\_scn\_mean = 33.510752344957446
- \* MAE = 0.591941441110655

---



---

- Time interval n.0: [67.16, 67.36]  
 \* y\_true: [27.17586615 28.72375126]  
 \* v\_ann: [25.57978057861328, 24.381244659423828, 3  
 2.13930608407808]

---

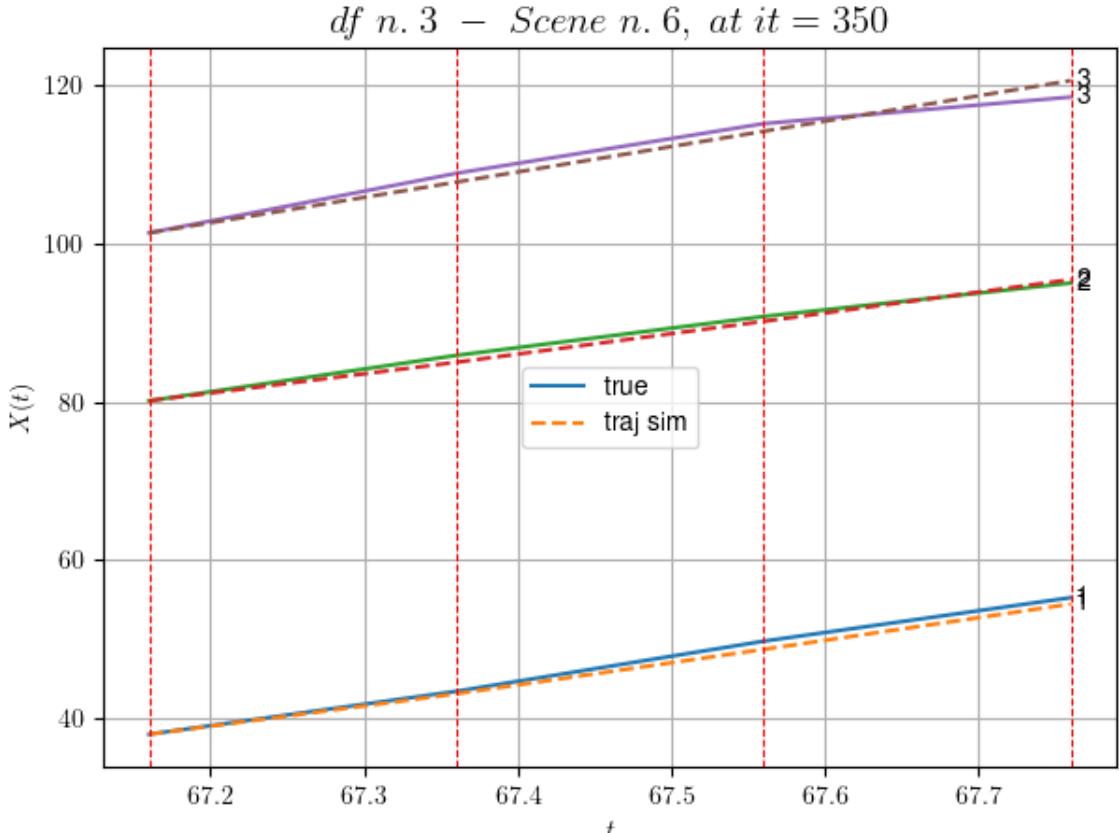
- Time interval n.1: [67.36, 67.56]  
 \* y\_true: [31.70635664 24.62373081]  
 \* v\_ann: [28.12199592590332, 25.86783218383789, 32.  
 13930608407808]

---

- Time interval n.2: [67.56, 67.76]  
 \* y\_true: [27.5714436 21.15852297]  
 \* v\_ann: [28.725534439086914, 26.486610412597656, 3  
 2.13930608407808]

---

\* err= 0.8087930682646266  
 \* Learning rate NN = 5.904899080633186e-05  
 \* diff = 0.0020407110514493176



For scene 6/55

\* use LR\_NN=0.0001 with err=4.381460640782722 at it=19  
 \* v0\_scn\_mean = 31.95595250133714  
 \* MAE = 0.7954968333686449

---



---

- Time interval n.0: [72.76, 72.96]  
 \* y\_true: [28.501496 30.93407752]  
 \* v\_ann: [31.7071475982666, 30.408037185668945, 28.  
 1212538387427]

---

- Time interval n.1: [72.96, 73.16]  
 \* y\_true: [36.65243351 31.9148258 ]  
 \* v\_ann: [31.32698631286621, 30.419837951660156, 2  
 8.1212538387427]

---

- Time interval n.2: [73.16, 73.36]  
 \* y\_true: [27.70226144 28.33497935]  
 \* v\_ann: [32.119354248046875, 31.870479583740234, 2  
 8.1212538387427]

---

- Time interval n.3: [73.36, 73.56]  
 \* y\_true: [34.7534691 39.55781959]  
 \* v\_ann: [31.092594146728516, 32.265602111816406, 2

8.1212538387427]

```

-----  

-----  

    - Time interval n.4: [73.56, 73.76]  

      * y_true: [35.21414381 29.47666535]  

      * v_ann: [32.70180892944336, 34.6649284362793, 28.1  

212538387427]  

-----  

-----  

    - Time interval n.5: [73.76, 73.96]  

      * y_true: [30.89430642 26.20657024]  

      * v_ann: [32.2940559387207, 30.881486892700195, 28.  

1212538387427]  

-----  

-----  

    - Time interval n.6: [73.96, 74.16]  

      * y_true: [32.05509091 31.88895952]  

      * v_ann: [31.28707504272461, 30.675920486450195, 2  

8.1212538387427]  

-----  

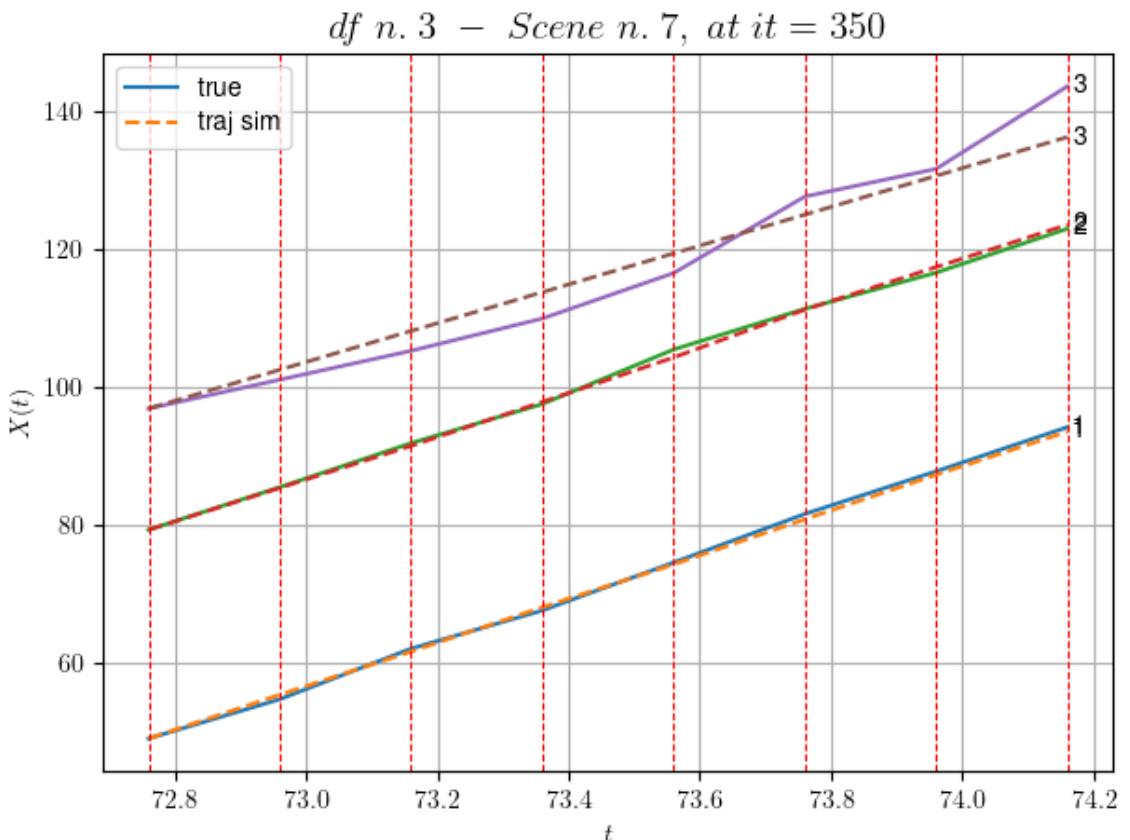
-----  

      * err= 4.159750809920846  

      * Learning rate NN = 2.5418647055630572e-05  

      * diff = 0.0003609989117681067

```



For scene 7/55

- \* use LR\_NN=0.0001 with err=47.09311094466495 at it=19
- \* v0\_scn\_mean = 28.282275602898505
- \* MAE = 4.13934931289097

```

=====
=====

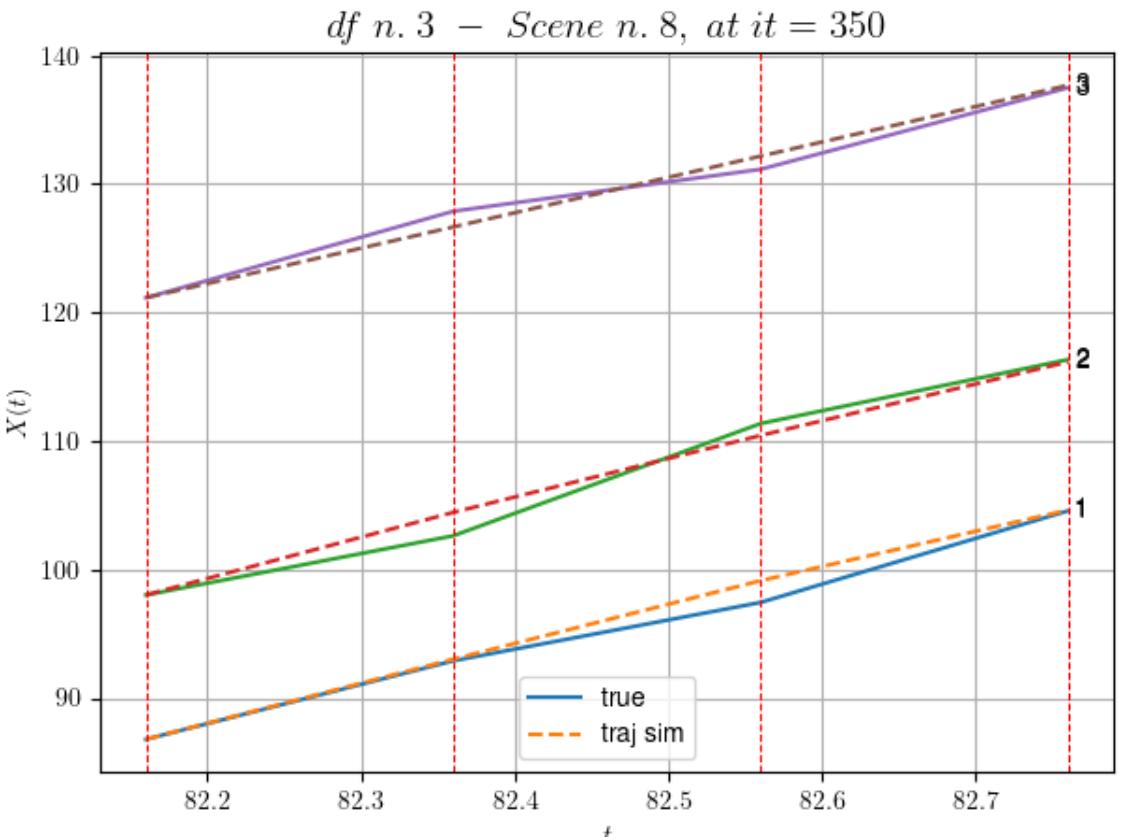
    - Time interval n.0: [82.16, 82.36]
      * y_true: [30.54468004 23.04450554]
      * v_ann: [31.169429779052734, 32.13331604003906, 2
7.55025511528059]

-----
    - Time interval n.1: [82.36, 82.56]
      * y_true: [22.71402344 43.65971655]
      * v_ann: [30.556886672973633, 29.9437313079834, 27.
55025511528059]

-----
    - Time interval n.2: [82.56, 82.76]
      * y_true: [35.61686857 24.88594316]
      * v_ann: [27.47536849975586, 28.609216690063477, 2
7.55025511528059]

-----
* err= 0.8048505594110823
* Learning rate NN = 0.0002952449722215533
* diff = 0.00012506542216700702

```



For scene 8/55

```

* use LR_NN=0.0005 with err=6.637796310722114 at it=19
* v0_scn_mean = 27.760215487364654
* MAE = 0.8002126236200467

```

```

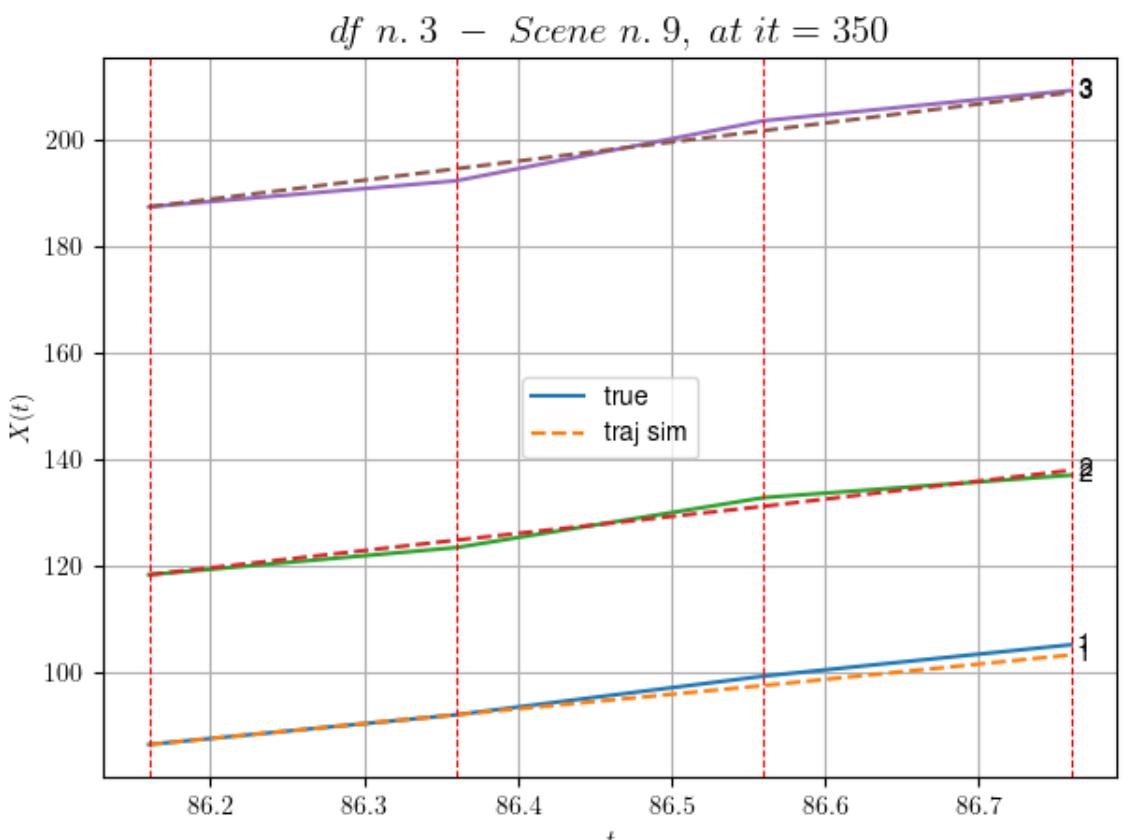
=====
- Time interval n.0: [86.16, 86.36]
  * y_true: [27.89181051 25.45740923]
  * v_ann: [27.88667106628418, 32.43852615356445, 35.
764694958435115]

-----
- Time interval n.1: [86.36, 86.56]
  * y_true: [36.25627338 46.92477715]
  * v_ann: [27.471757888793945, 31.783979415893555, 3
5.764694958435115]

-----
- Time interval n.2: [86.56, 86.76]
  * y_true: [29.50579063 21.07714474]
  * v_ann: [28.745615005493164, 33.826194763183594, 3
5.764694958435115]

-----
* err= 1.7431883900664096
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.018036773558243402

```



For scene 9/55  
\* use LR\_NN=1e-05 with err=13.813661099412466 at it=19  
\* v0\_scn\_mean = 35.27062004231875  
\* MAE = 1.7431883900664096

```
=====
- Time interval n.0: [130.96, 131.16]
  * y_true: [15.85249734 39.95916833]
  * v_ann: [32.03648376464844, 30.593887329101562, 3
1.752325223025004]

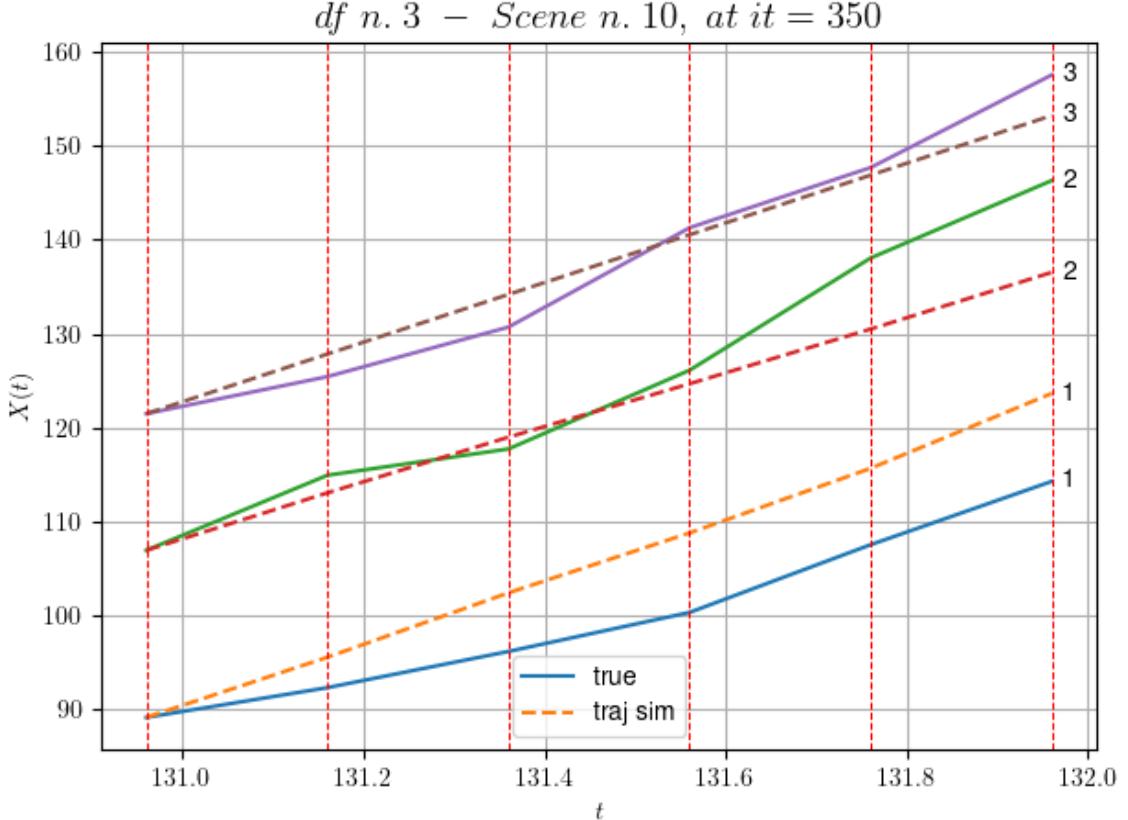
-----
- Time interval n.1: [131.16, 131.36]
  * y_true: [19.2732587 14.0236874]
  * v_ann: [34.291770935058594, 29.66135025024414, 3
1.752325223025004]

-----
- Time interval n.2: [131.36, 131.56]
  * y_true: [20.77382027 41.90201833]
  * v_ann: [31.90293312072754, 28.428966522216797, 3
1.752325223025004]

-----
- Time interval n.3: [131.56, 131.76]
  * y_true: [36.06757222 59.75967406]
  * v_ann: [34.40879821777344, 29.12322235107422, 31.
752325223025004]

-----
- Time interval n.4: [131.76, 131.96]
  * y_true: [33.71775213 41.23564164]
  * v_ann: [39.87129592895508, 30.201480865478516, 3
1.752325223025004]

-----
* err= 26.260311523638837
* Learning rate NN = 3.874203684972599e-05
* diff = 0.015658662247602706
```



For scene 10/55

\* use LR\_NN=0.0001 with err=59.495249498174054 at it=19

\* v0\_scn\_mean = 31.60213862272469

\* MAE = 15.106803405774043

- 
- 
- Time interval n.0: [139.16, 139.36]
    - \* y\_true: [22.50033849 31.62238978]
    - \* v\_ann: [26.468700408935547, 28.202381134033203, 2 8.144643973847398]
- 
- Time interval n.1: [139.36, 139.56]
    - \* y\_true: [29.90063418 17.15160439]
    - \* v\_ann: [27.309288024902344, 27.61103057861328, 2 8.144643973847398]
- 
- Time interval n.2: [139.56, 139.76]
    - \* y\_true: [27.10078793 37.57385655]
    - \* v\_ann: [25.756465911865234, 27.831193923950195, 2 8.144643973847398]
- 
- Time interval n.3: [139.76, 139.96]
    - \* y\_true: [25.40095052 21.65266443]
    - \* v\_ann: [27.31576919555664, 28.45586395263672, 28. 144643973847398]

```
- Time interval n.4: [139.96, 140.16]
  * y_true: [21.40097883 32.03445568]
  * v_ann: [26.544570922851562, 27.36029815673828, 2
8.144643973847398]

-----
- Time interval n.5: [140.16, 140.36]
  * y_true: [21.7011754 31.91506312]
  * v_ann: [27.49907875061035, 26.948143005371094, 2
8.144643973847398]

-----
- Time interval n.6: [140.36, 140.56]
  * y_true: [30.50199276 23.65435061]
  * v_ann: [28.37306785583496, 26.402454376220703, 2
8.144643973847398]

-----
- Time interval n.7: [140.56, 140.76]
  * y_true: [27.90220498 42.04863469]
  * v_ann: [27.625123977661133, 28.311656951904297, 2
8.144643973847398]

-----
- Time interval n.8: [140.76, 140.96]
  * y_true: [45.30444602 33.92792147]
  * v_ann: [29.823482513427734, 28.550861358642578, 2
8.144643973847398]

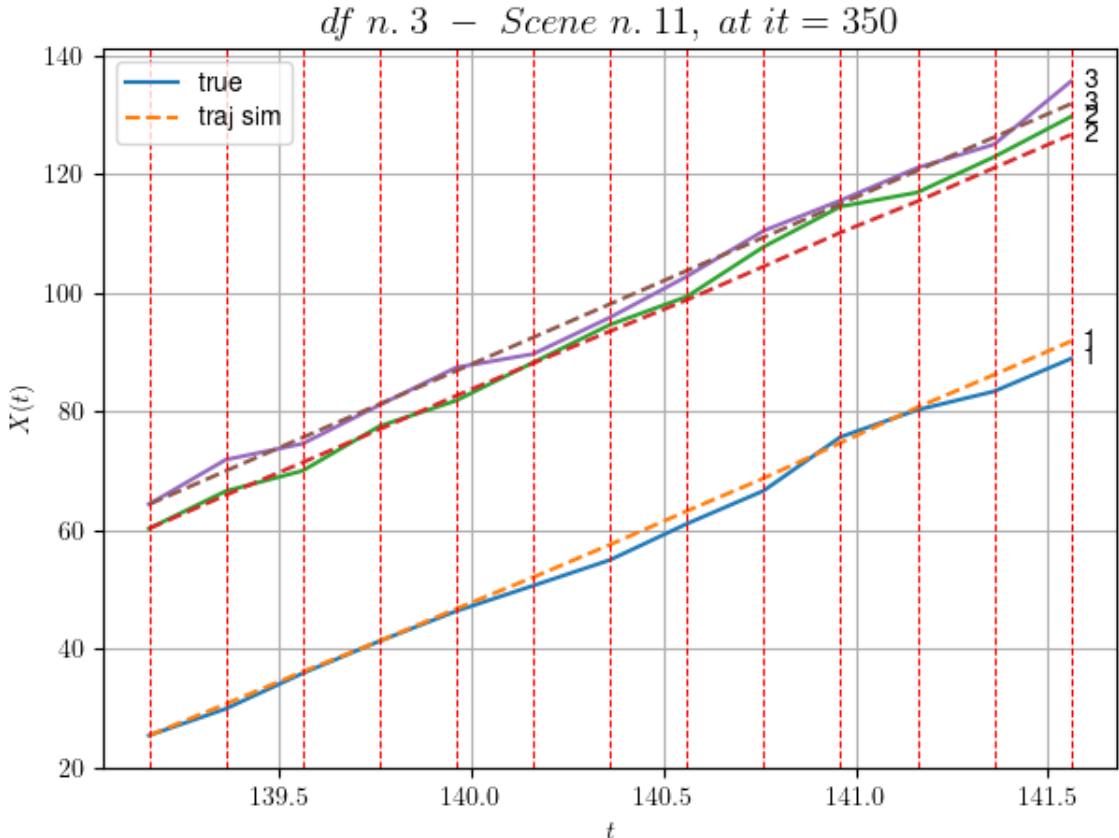
-----
- Time interval n.9: [140.96, 141.16]
  * y_true: [22.85268623 11.9131035 ]
  * v_ann: [29.991600036621094, 26.297393798828125, 2
8.144643973847398]

-----
- Time interval n.10: [141.16, 141.36]
  * y_true: [15.65202595 30.01833255]
  * v_ann: [27.531801223754883, 28.27002716064453, 2
8.144643973847398]

-----
- Time interval n.11: [141.36, 141.56]
  * y_true: [27.55395105 33.94025545]
  * v_ann: [28.298009872436523, 28.010164260864258, 2
8.144643973847398]

-----
* err= 3.149844060503962
```

\* Learning rate NN = 4.431466732057743e-05  
 \* diff = 0.0015451481957606816



For scene 11/55

\* use LR\_NN=0.0005 with err=239.74358814427353 at it=19  
 \* v0\_scn\_mean = 28.30366103886062  
 \* MAE = 2.424785138833824

---



---

- Time interval n.0: [143.76, 143.96]  
 \* y\_true: [30.62207823 41.7261053 ]  
 \* v\_ann: [27.458877563476562, 26.496183395385742, 2  
 9.414748692205062]

---

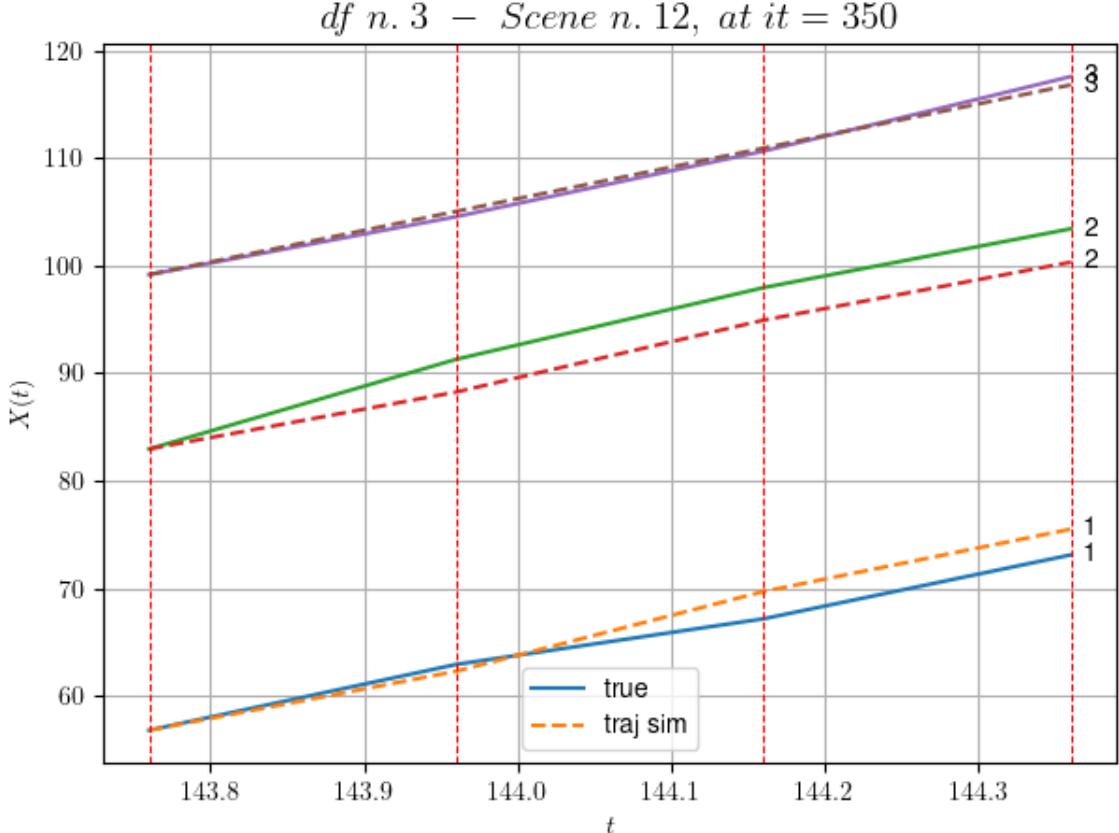
- Time interval n.1: [143.96, 144.16]  
 \* y\_true: [21.21173425 33.31570327]  
 \* v\_ann: [37.069034576416016, 33.42289733886719, 2  
 9.414748692205062]

---

- Time interval n.2: [144.16, 144.36]  
 \* y\_true: [29.72284222 27.36558717]  
 \* v\_ann: [28.996652603149414, 26.969507217407227, 2  
 9.414748692205062]

\* err= 3.4631443603828695

\* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.00026468567862281134



For scene 12/55

\* use LR\_NN=0.0005 with err=17.53563658624119 at it=19  
 \* v0\_scn\_mean = 29.464908846886726  
 \* MAE = 3.4628219253165784

---



---

- Time interval n.0: [149.36, 149.56]  
 \* y\_true: [25.90049539 27.45094024]  
 \* v\_ann: [27.12377166748047, 28.246835708618164, 2  
 3.4436027042894]

---



---

- Time interval n.1: [149.56, 149.76]  
 \* y\_true: [21.18057417 22.42095425]  
 \* v\_ann: [26.930288314819336, 26.97701072692871, 2  
 3.4436027042894]

---



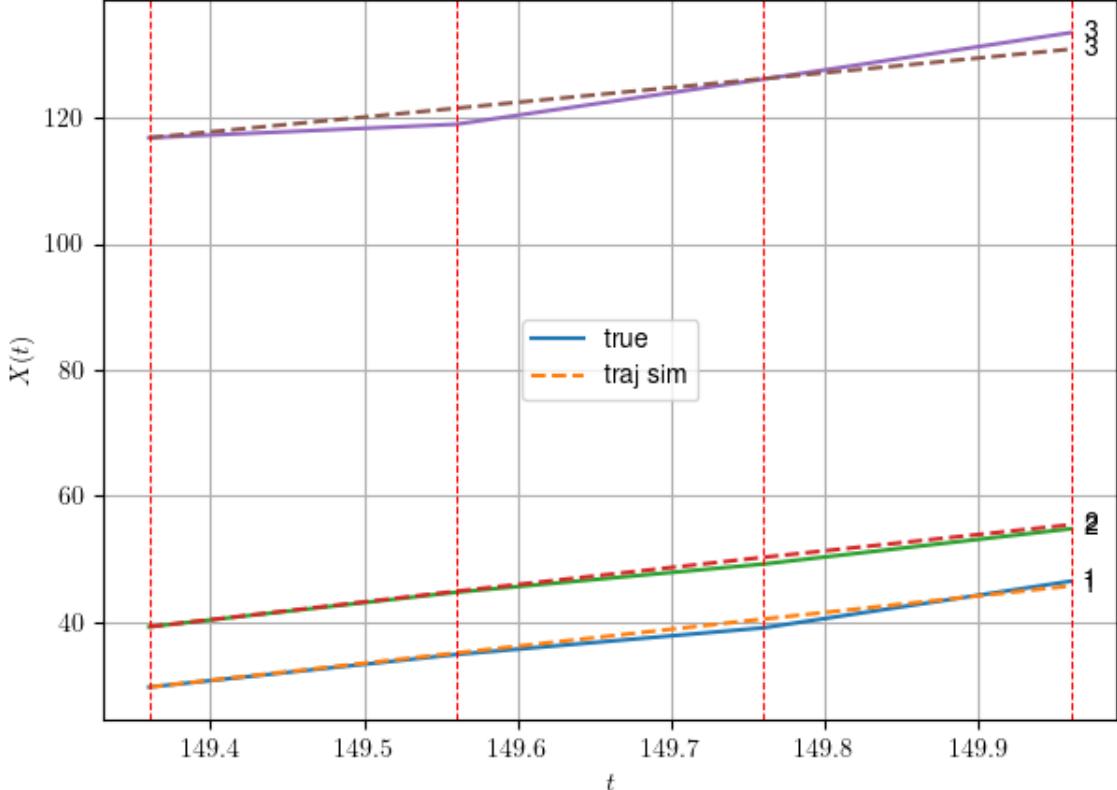
---

- Time interval n.2: [149.76, 149.96]  
 \* y\_true: [37.02126181 27.98148311]  
 \* v\_ann: [26.30828094482422, 25.849624633789062, 2  
 3.4436027042894]

\* err= 1.4615817624469123

\* Learning rate NN = 5.904899080633186e-05  
 \* diff = 0.00010488373346520050

df n. 3 - Scene n. 13, at it = 350



For scene 13/55

\* use LR\_NN=0.0001 with err=26.403990316958154 at it=19  
 \* v0\_scn\_mean = 24.00553208082398  
 \* MAE = 1.4065825011292301

---



---

- Time interval n.0: [156.16, 156.36]  
 \* y\_true: [12.56997445 35.72646923]  
 \* v\_ann: [25.419126510620117, 29.48014259338379, 3  
 6.77956791836885]

---

- Time interval n.1: [156.36, 156.56]  
 \* y\_true: [42.07610638 31.26485338]  
 \* v\_ann: [31.37784194946289, 29.517080307006836, 3  
 6.77956791836885]

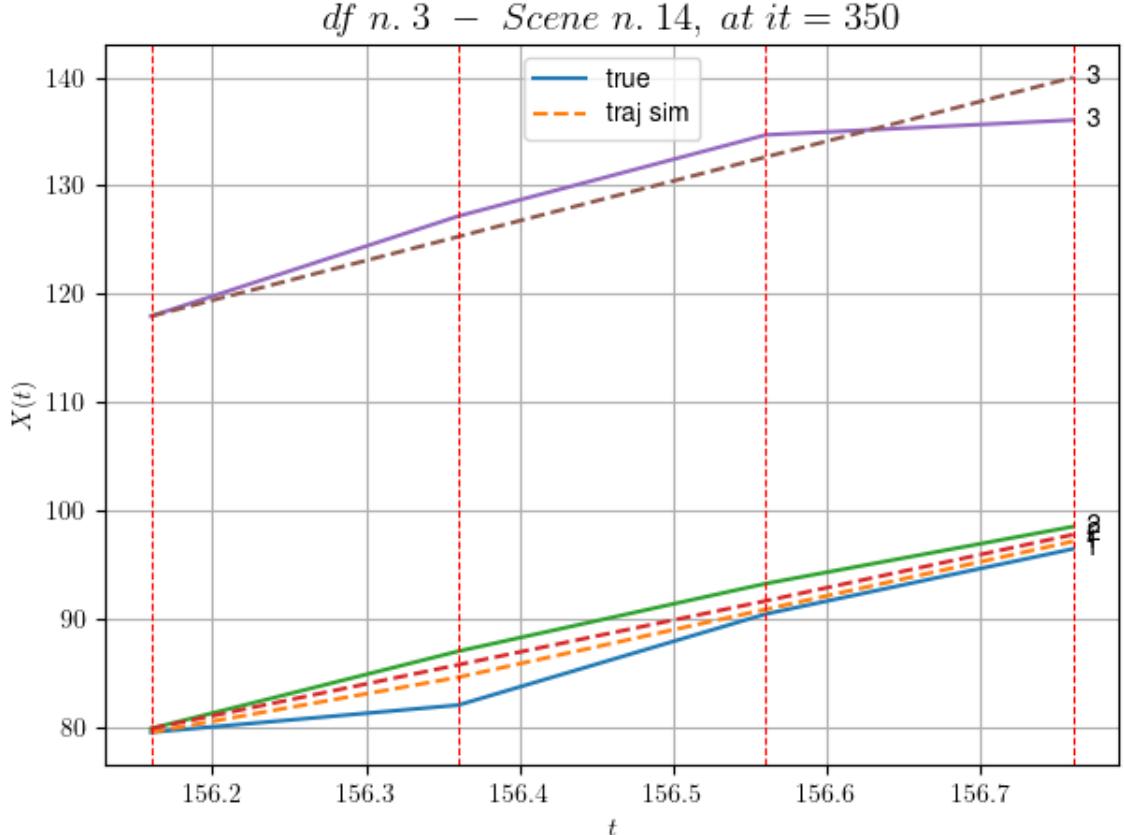
---

- Time interval n.2: [156.56, 156.76]  
 \* y\_true: [30.09491831 26.35466702]  
 \* v\_ann: [31.44399070739746, 30.634340286254883, 3  
 6.77956791836885]

---

\* err= 2.933227310591344  
 \* Learning rate NN = 2.952449540316593e-05

\* diff = 0.00010361698444238954



For scene 14/55

\* use LR\_NN=5e-05 with err=28.609135846750416 at it=19  
 \* v0\_scn\_mean = 36.19851124933011  
 \* MAE = 2.613554201005115

---



---

- Time interval n.0: [207.96, 208.16]  
 \* y\_true: [30.12104774 28.85226703]  
 \* v\_ann: [30.918596267700195, 30.679521560668945, 3  
 1.1249015167828]

---

- Time interval n.1: [208.16, 208.36]  
 \* y\_true: [31.19139939 27.73265496]  
 \* v\_ann: [29.819015502929688, 29.95290756225586, 3  
 1.1249015167828]

---

- Time interval n.2: [208.36, 208.56]  
 \* y\_true: [31.59181924 26.81292648]  
 \* v\_ann: [29.43616485595703, 29.512672424316406, 3  
 1.1249015167828]

---

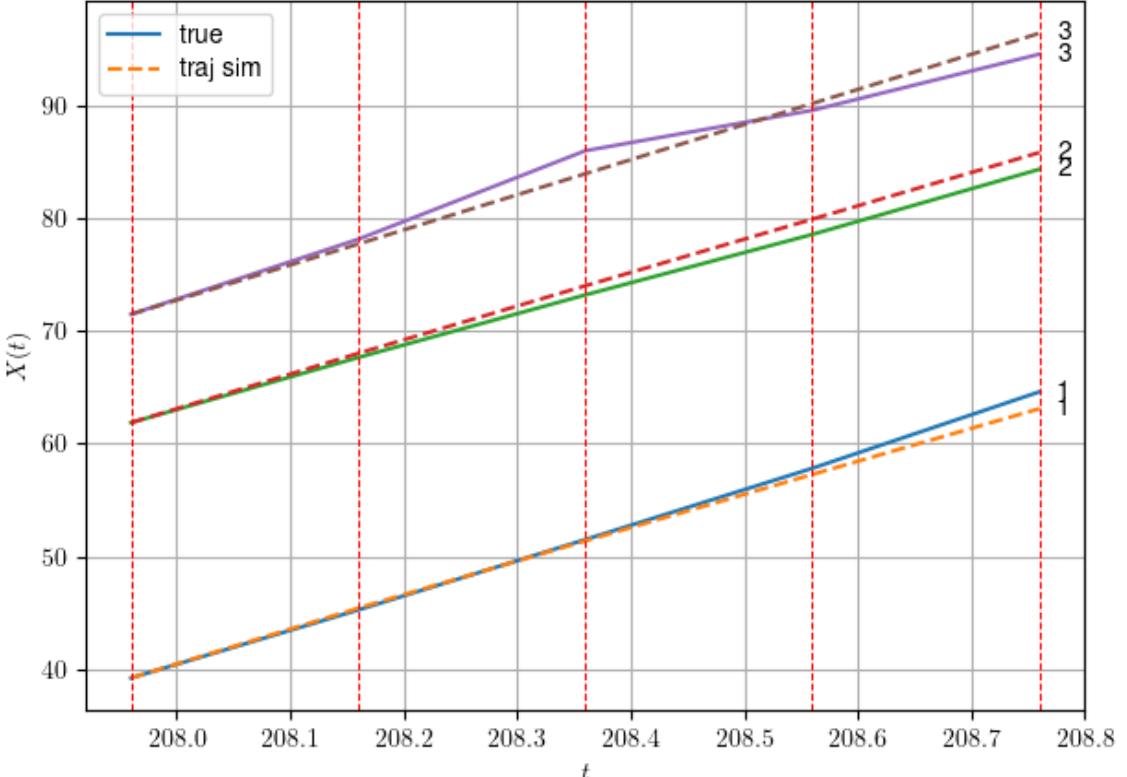
- Time interval n.3: [208.56, 208.76]  
 \* y\_true: [33.88244728 28.87369213]

\* v\_ann: [29.1566162109375, 29.54792022705078, 31.1  
249015167828]

---

\* err= 1.0331325735800743  
\* Learning rate NN = 0.000239148415857926  
\* diff = 0.00023487189635917893

*df n. 3 – Scene n. 15, at it = 350*



For scene 15/55

\* use LR\_NN=0.0005 with err=9.51258559110638 at it=19  
\* v0\_scn\_mean = 31.028489542419344  
\* MAE = 0.9867366118946695

---



---

- Time interval n.0: [218.16, 218.36]  
\* y\_true: [26.47083003 31.40159485]  
\* v\_ann: [32.51288604736328, 32.02362823486328, 31.  
94691151510615]

---



---

- Time interval n.1: [218.36, 218.56]  
\* y\_true: [32.09751616 29.50187244]  
\* v\_ann: [29.998632431030273, 30.08245086669922, 3  
1.94691151510615]

---



---

- Time interval n.2: [218.56, 218.76]  
\* y\_true: [31.61167285 38.50305628]

```
* v_ann: [30.85411834716797, 31.15361213684082, 31.
94691151510615]
```

---

```
- Time interval n.3: [218.76, 218.96]
* y_true: [30.522016 20.15190279]
* v_ann: [31.55730438232422, 33.15715789794922, 31.
```

```
94691151510615]
```

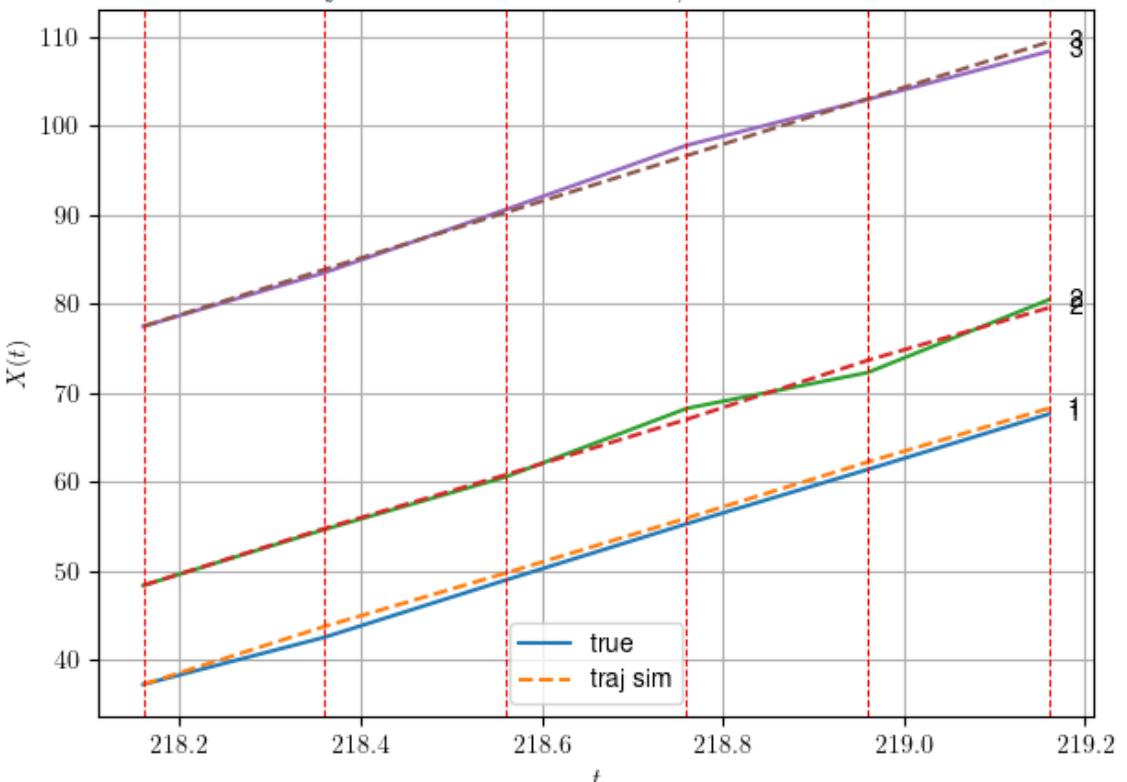
---

```
- Time interval n.4: [218.96, 219.16]
* y_true: [31.13252968 40.9045659 ]
* v_ann: [30.16444206237793, 29.499696731567383, 3
1.94691151510615]
```

---

```
* err= 0.5909052095020672
* Learning rate NN = 0.0001937102060765028
* diff = 0.0006025110511005072
```

*df n. 3 – Scene n. 16, at it = 350*



For scene 16/55

```
* use LR_NN=0.0005 with err=26.772960367531656 at it=19
* v0_scn_mean = 31.780047500540157
* MAE = 0.5672926794099263
```

---



---



---

```
- Time interval n.0: [222.96, 223.16]
* y_true: [37.21103813 39.71315438]
* v_ann: [35.050323486328125, 34.2397575378418, 31.
```

279741440153785]

```
- Time interval n.1: [223.16, 223.36]
  * y_true: [31.35126998 28.99272163]
  * v_ann: [35.65785598754883, 35.22203063964844, 31.
```

279741440153785]

```
- Time interval n.2: [223.36, 223.56]
  * y_true: [33.72173898 31.78369531]
  * v_ann: [34.910396575927734, 34.38518142700195, 3
```

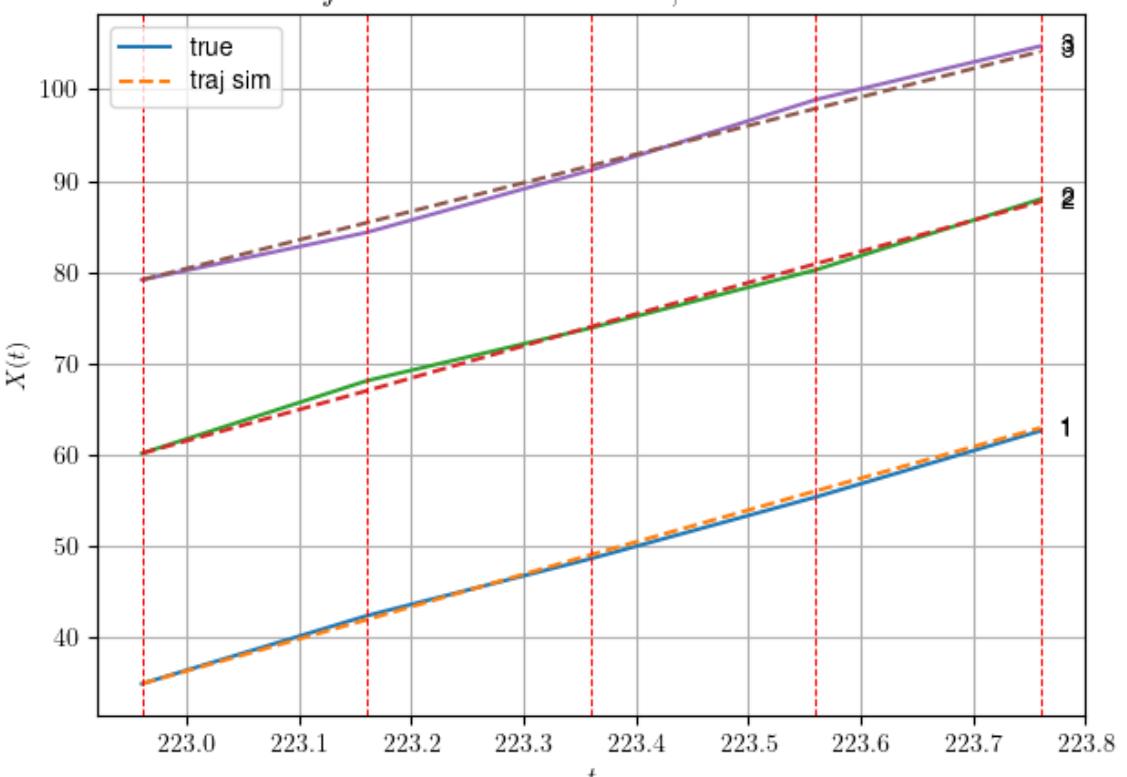
1.279741440153785]

```
- Time interval n.3: [223.56, 223.76]
  * y_true: [36.23248355 38.79526469]
  * v_ann: [34.57347106933594, 33.922359466552734, 3
```

1.279741440153785]

```
* err= 0.358431042785228
* Learning rate NN = 2.3914839403005317e-05
* diff = 0.00016212744797100553
```

df n. 3 – Scene n. 17, at it = 350



For scene 17/55

```
* use LR_NN=5e-05 with err=6.183690697465774 at it=19
* v0_scn_mean = 31.1700585949637
* MAE = 0.358431042785228
```

```
=====
- Time interval n.0: [247.36, 247.56]
  * y_true: [24.34113117 25.37248976]
  * v_ann: [29.0559024810791, 26.78928565979004, 29.1
99550876740712]

-----
- Time interval n.1: [247.56, 247.76]
  * y_true: [20.86113385 27.00305492]
  * v_ann: [27.329509735107422, 25.86216163635254, 2
9.199550876740712]

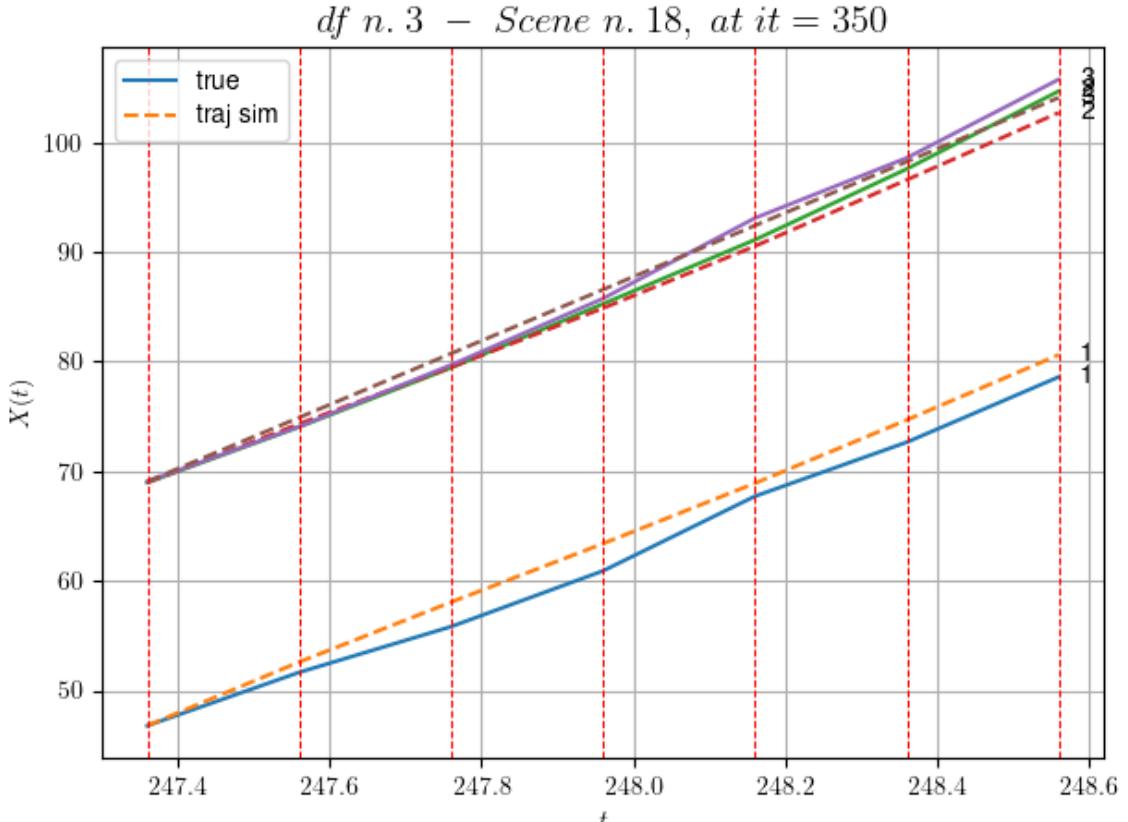
-----
- Time interval n.2: [247.76, 247.96]
  * y_true: [25.44173909 29.15378269]
  * v_ann: [26.717138290405273, 26.902185440063477, 2
9.199550876740712]

-----
- Time interval n.3: [247.96, 248.16]
  * y_true: [34.05263307 29.24437105]
  * v_ann: [27.528257369995117, 28.31702423095703, 2
9.199550876740712]

-----
- Time interval n.4: [248.16, 248.36]
  * y_true: [24.6823336 32.34552948]
  * v_ann: [28.903745651245117, 30.281139373779297, 2
9.199550876740712]

-----
- Time interval n.5: [248.36, 248.56]
  * y_true: [29.77329807 35.48696999]
  * v_ann: [29.717693328857422, 30.616283416748047, 2
9.199550876740712]

=====
* err= 1.5680186723235898
* Learning rate NN = 0.00031381050939671695
* diff = 0.0003171175871679033
```



For scene 18/55

- \* use LR\_NN=0.001 with err=5.493471525362871 at it=19
- \* v0\_scn\_mean = 29.26815499825642
- \* MAE = 1.108216813614553

---



---

- Time interval n.0: [269.56, 269.76]
- \* y\_true: [27.75027124 32.18076388]
- \* v\_ann: [29.179847717285156, 29.336231231689453, 3 0.53917177371945]

---

- Time interval n.1: [269.76, 269.96]
- \* y\_true: [33.80053503 32.77104018]
- \* v\_ann: [29.258018493652344, 29.303760528564453, 3 0.53917177371945]

---

- Time interval n.2: [269.96, 270.16]
- \* y\_true: [22.10049768 29.95131945]
- \* v\_ann: [30.609872817993164, 30.862573623657227, 3 0.53917177371945]

---

- Time interval n.3: [270.16, 270.36]
- \* y\_true: [32.40098084 29.70158012]
- \* v\_ann: [28.85087013244629, 29.160297393798828, 3

0.53917177371945]

---

- Time interval n.4: [270.36, 270.56]
  - \* y\_true: [29.55119411 25.63174114]
  - \* v\_ann: [29.571292877197266, 30.189971923828125, 3

0.53917177371945]

---

- Time interval n.5: [270.56, 270.76]
  - \* y\_true: [29.3015063 30.75243246]
  - \* v\_ann: [28.86603546142578, 29.3424129486084, 30.5

3917177371945]

---

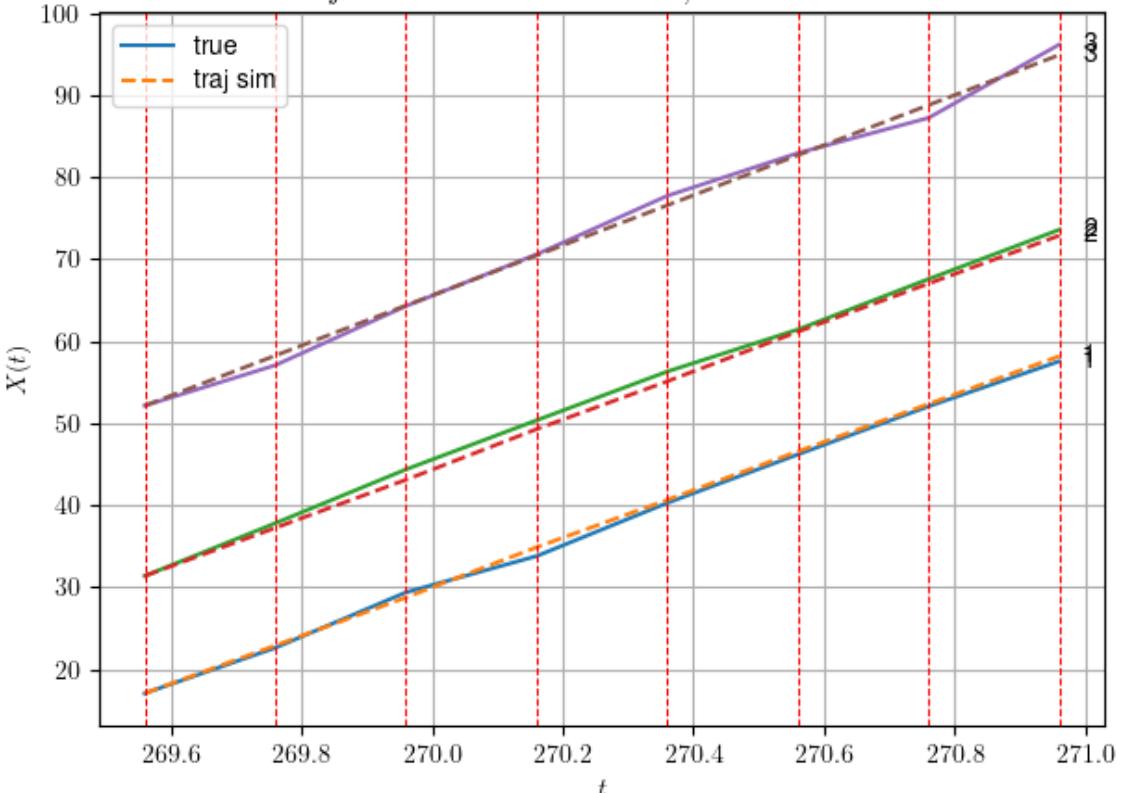
- Time interval n.6: [270.76, 270.96]
  - \* y\_true: [27.50174001 30.06304641]
  - \* v\_ann: [29.12931251525879, 29.266508102416992, 3

0.53917177371945]

---

- \* err= 0.6086458217770642
- \* Learning rate NN = 0.00012709324073512107
- \* diff = 0.001158800201025076

*df n. 3 – Scene n. 19, at it = 350*



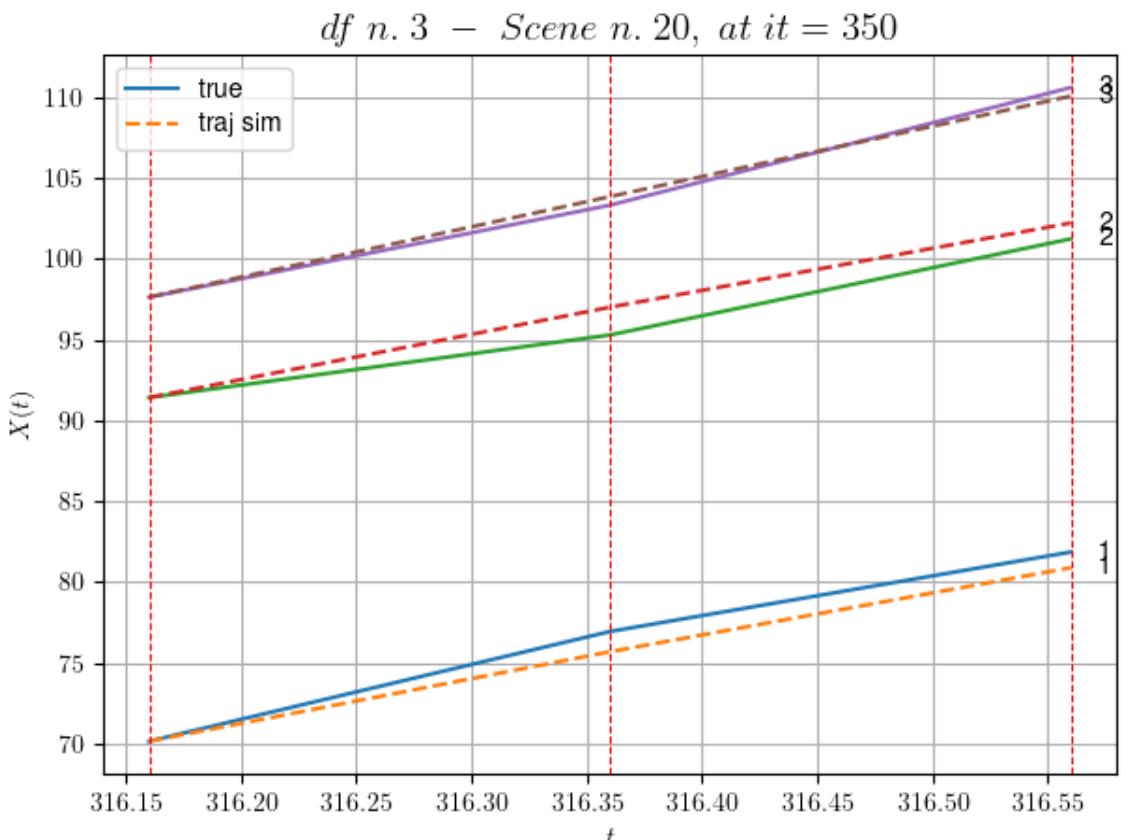
For scene 19/55

- \* use LR\_NN=0.0005 with err=5.704461764899353 at it=19
- \* v0\_scn\_mean = 30.492960959306323
- \* MAE = 0.4707952105075408

```
=====
- Time interval n.0: [316.16, 316.36]
  * y_true: [33.9635286 19.3731464]
  * v_ann: [27.695039749145508, 27.974506378173828, 3
  1.119723216260347]
```

```
=====
- Time interval n.1: [316.36, 316.56]
  * y_true: [24.60296417 29.75560281]
  * v_ann: [26.018709182739258, 26.072124481201172, 3
  1.119723216260347]
```

```
=====
* err= 0.7777577611392342
* Learning rate NN = 7.289998757187277e-05
* diff = 7.799163590882507e-05
```



For scene 20/55

```
* use LR_NN=0.0001 with err=3.191952989182653 at it=19
* v0_scn_mean = 31.02375505868519
* MAE = 0.7777577611392342
```

```
=====
- Time interval n.0: [317.76, 317.96]
  * y_true: [22.24301013 28.10582296]
  * v_ann: [28.032629013061523, 30.83994483947754, 2
  8.729615682184505]
```

```

-----  

-----  

    - Time interval n.1: [317.96, 318.16]  

      * y_true: [28.26433817 33.10585656]  

      * v_ann: [23.519412994384766, 28.  

729615682184505]  

-----
```

```

-----  

-----  

    - Time interval n.2: [318.16, 318.36]  

      * y_true: [11.28182915 18.67354228]  

      * v_ann: [30.40513038635254, 15.42831802368164, 28.  

729615682184505]  

-----
```

```

-----  

-----  

    - Time interval n.3: [318.36, 318.56]  

      * y_true: [28.12514655 32.86712293]  

      * v_ann: [21.542098999023438, 20.25080680847168, 2  

8.729615682184505]  

-----
```

```

-----  

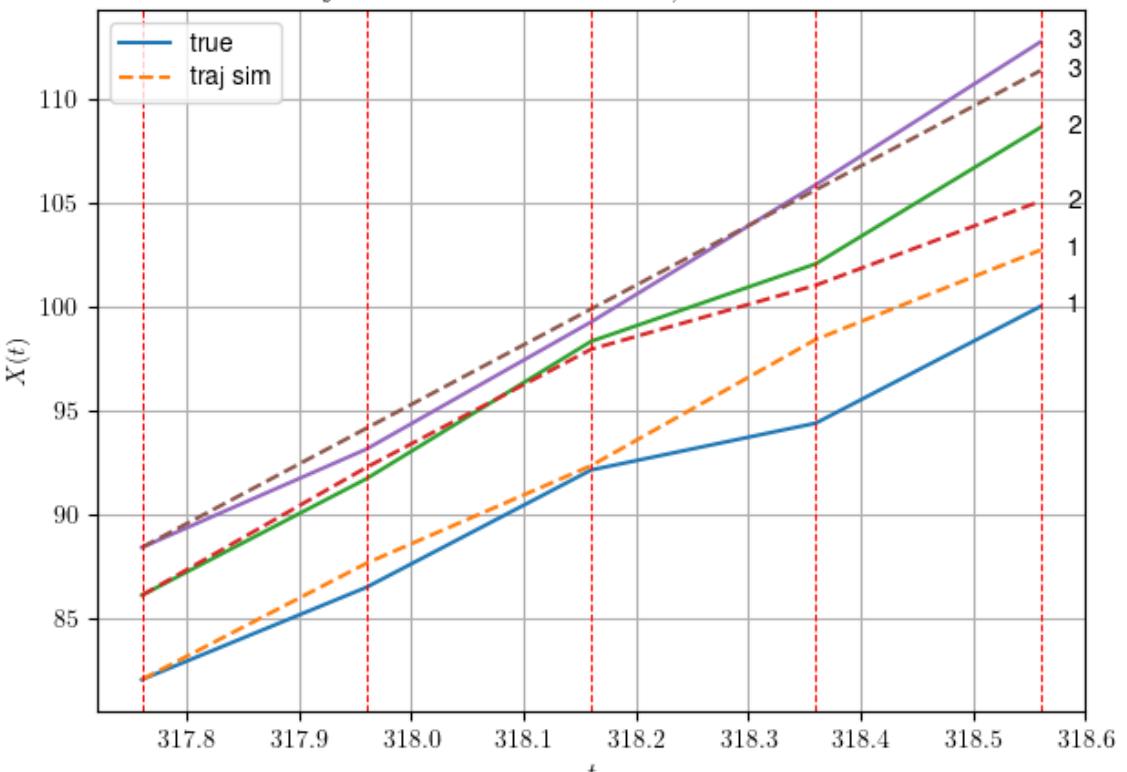
-----  

      * err= 2.836633808741666  

      * Learning rate NN = 0.002391484100371599  

      * diff = 0.0032660776158239813
```

*df n. 3 – Scene n. 21, at it = 350*



For scene 21/55

```

* use LR_NN=0.005 with err=14.627044713911081 at it=19  

* v0_scn_mean = 28.838496556157345  

* MAE = 2.836633808741666
```

```
- Time interval n.0: [325.76, 325.96]
  * y_true: [25.31057708 30.22149101]
  * v_ann: [21.97768783569336, 27.154569625854492, 3
3.13552965013222]

-----
- Time interval n.1: [325.96, 326.16]
  * y_true: [25.23074384 33.46208613]
  * v_ann: [24.49083709716797, 30.759979248046875, 3
3.13552965013222]

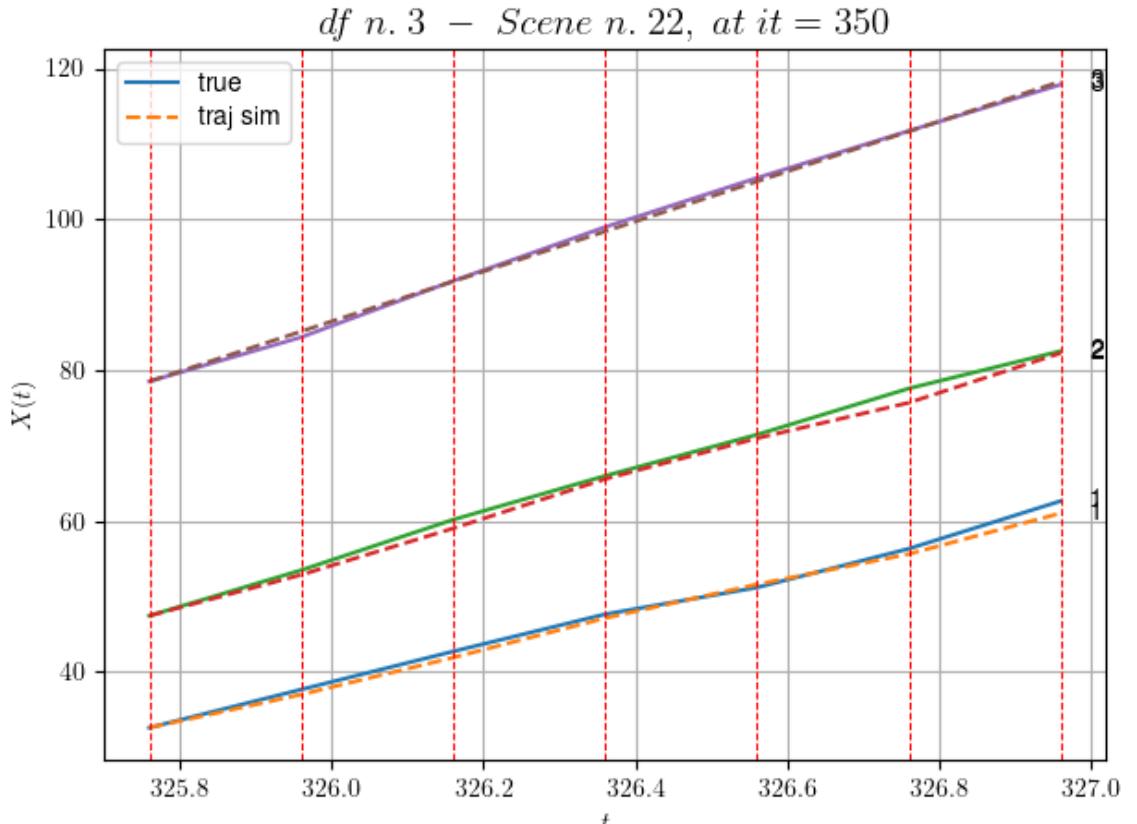
-----
- Time interval n.2: [326.16, 326.36]
  * y_true: [24.63092838 29.01218385]
  * v_ann: [26.13072395324707, 32.681854248046875, 3
3.13552965013222]

-----
- Time interval n.3: [326.36, 326.56]
  * y_true: [17.72077879 27.33248549]
  * v_ann: [22.360822677612305, 27.00834846496582, 3
3.13552965013222]

-----
- Time interval n.4: [326.56, 326.76]
  * y_true: [25.71142574 30.60327071]
  * v_ann: [20.113237380981445, 23.57953643798828, 3
3.13552965013222]

-----
- Time interval n.5: [326.76, 326.96]
  * y_true: [31.6120671 24.79299826]
  * v_ann: [27.08793067932129, 32.91807556152344, 33.
13552965013222]

-----
* err= 0.5573673536636693
* Learning rate NN = 0.00015690525469835848
* diff = 0.0015976323308458662
```



For scene 22/55

- \* use LR\_NN=0.0005 with err=11.308324379220599 at it=19
- \* v0\_scn\_mean = 32.866792698734464
- \* MAE = 0.5454049440405512

---



---

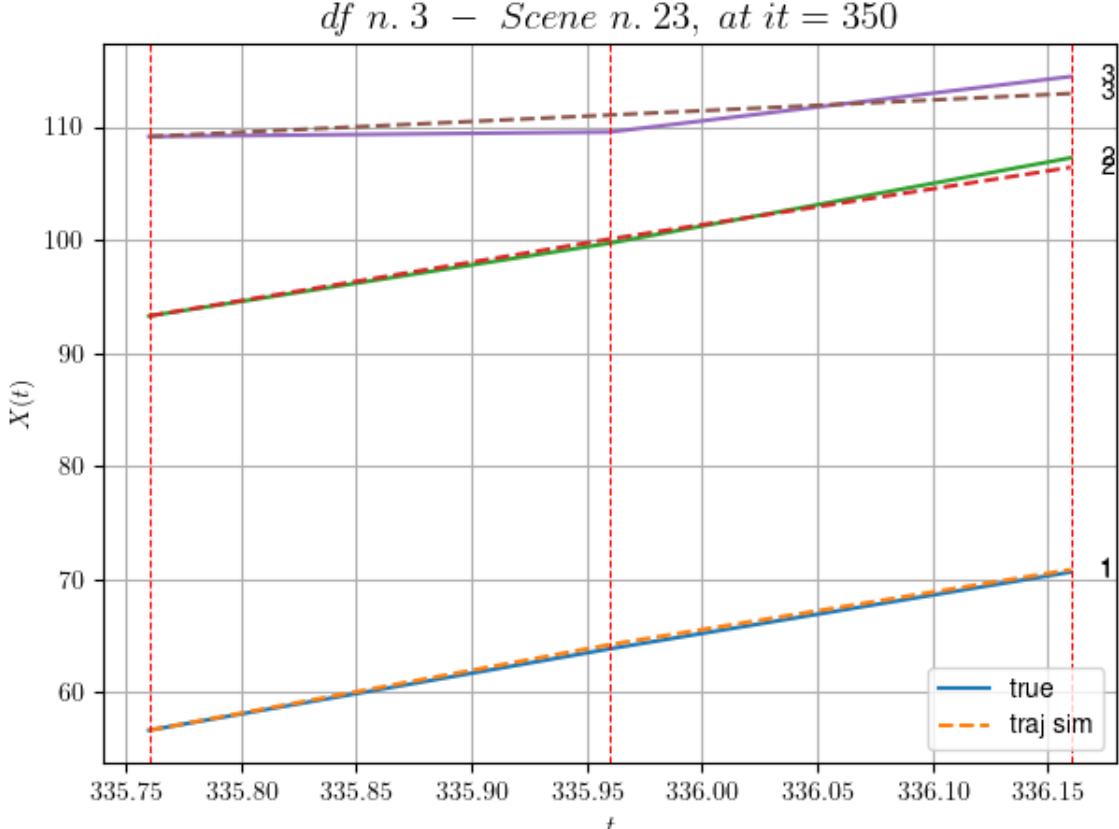
- Time interval n.0: [335.76, 335.96]
- \* y\_true: [36.00253797 32.17585284]
- \* v\_ann: [37.85216522216797, 33.994232177734375, 9.495828685169702]

---

- Time interval n.1: [335.96, 336.16]
- \* y\_true: [33.90297107 37.71766361]
- \* v\_ann: [33.14580535888672, 31.676393508911133, 9.495828685169702]

---

- \* err= 0.6151445816724469
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 0.0049675302542337985



For scene 23/55

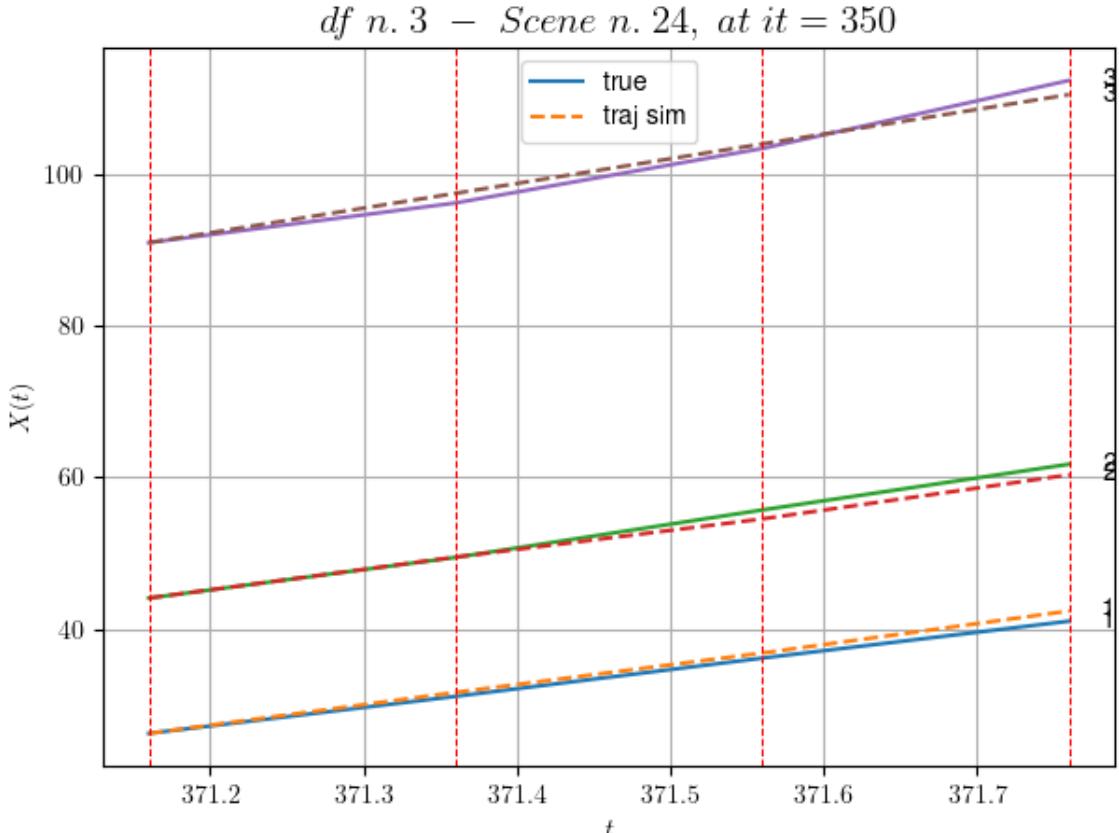
\* use LR\_NN=0.0001 with err=16.955484718530002 at it=19  
 \* v0\_scn\_mean = 11.253180426321075  
 \* MAE = 0.6151445816724469

- Time interval n.0: [371.16, 371.36]  
 \* y\_true: [24.42036896 26.80112378]  
 \* v\_ann: [27.031797409057617, 27.007322311401367, 3  
 2.53948924917022]

- Time interval n.1: [371.36, 371.56]  
 \* y\_true: [25.21053633 31.30165898]  
 \* v\_ann: [25.936058044433594, 25.17158317565918, 3  
 2.53948924917022]

- Time interval n.2: [371.56, 371.76]  
 \* y\_true: [24.36067127 30.15199262]  
 \* v\_ann: [27.730539321899414, 29.068178176879883, 3  
 2.53948924917022]

\* err= 0.9448887193618166  
 \* Learning rate NN = 5.904899080633186e-05  
 \* diff = 0.00010386135424678145



For scene 24/55

```
* use LR_NN=0.0001 with err=7.50218093237806 at it=19
* v0_scn_mean = 32.321837153646065
* MAE = 0.9382322212453937
```

---



---

- Time interval n.0: [387.36, 387.56]
  - \* y\_true: [32.47194771 39.46360823]
  - \* v\_ann: [0.0003094935673289001, 4.1401056844955764e-13, 33.03187618027038]
  
- Time interval n.1: [387.56, 387.76]
  - \* y\_true: [28.80212467 26.65295039]
  - \* v\_ann: [4.6916120481910184e-05, 2.0378008308563622e-11, 33.03187618027038]
  
- Time interval n.2: [387.76, 387.96]
  - \* y\_true: [28.30253286 24.25305315]
  - \* v\_ann: [8.372434240300208e-05, 2.8964471879971976e-13, 33.03187618027038]
  
- Time interval n.3: [387.96, 388.16]
  - \* y\_true: [34.31356051 24.78356316]
  - \* v\_ann: [0.0002498278336133808, 2.68491927638264e-

14, 33.03187618027038]

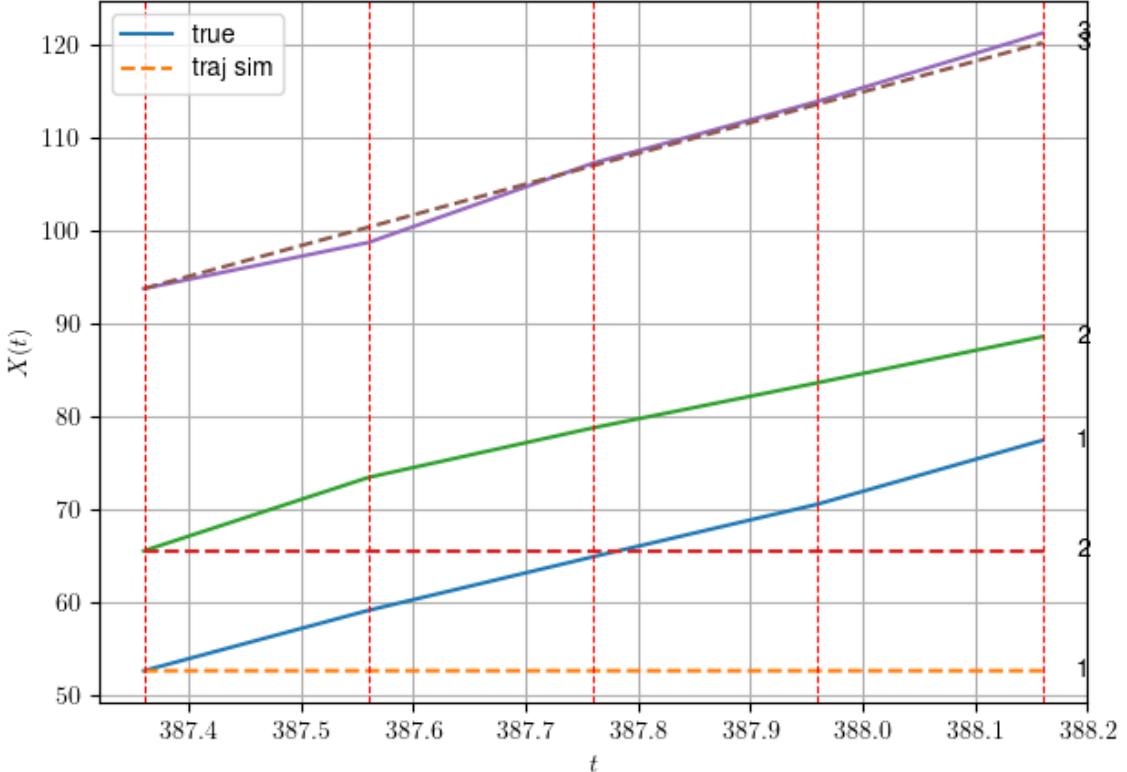
---



---

- \* err= 148.36477116181973
- \* Learning rate NN = 0.000239148415857926
- \* diff = 3.6333182436010247e-06

*df n. 3 – Scene n. 25, at it = 350*



For scene 25/55

- \* use LR\_NN=0.0005 with err=16.286913891857775 at it=19
- \* v0\_scn\_mean = 32.772023060505184
- \* MAE = 21.227881543341198

---



---



---



---

- Time interval n.0: [390.36, 390.56]
- \* y\_true: [34.37306474 33.21473815]
- \* v\_ann: [2.640578600221488e-07, 4.293061010685051e-06, 36.35421452147256]

---



---



---

- Time interval n.1: [390.56, 390.76]
- \* y\_true: [31.79338609 29.7348149 ]
- \* v\_ann: [3.5989290836369037e-07, 2.558964524723706e-07, 36.35421452147256]

---

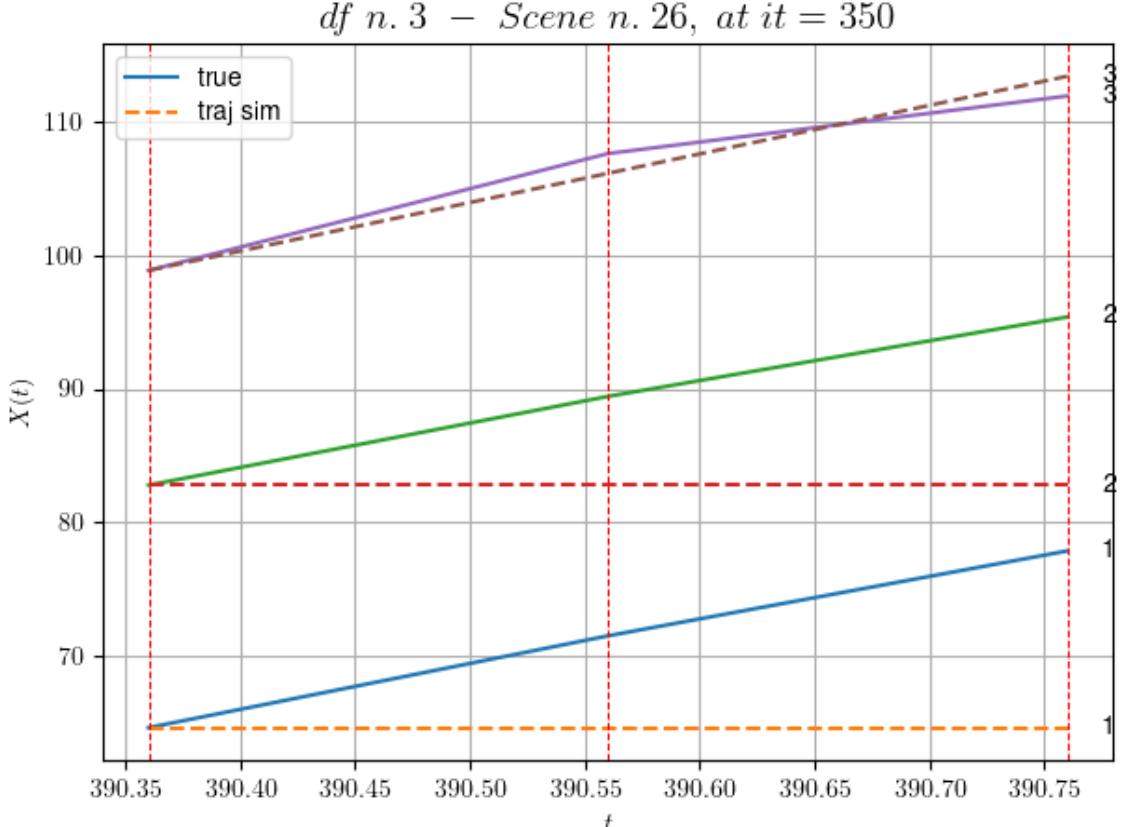


---



---

- \* err= 47.709926425391465
- \* Learning rate NN = 7.289998757187277e-05
- \* diff = 1.0833598409476508e-06



For scene 26/55

\* use LR\_NN=0.0001 with err=1.0495685156884973 at it=19  
 \* v0\_scn\_mean = 35.809613631169675  
 \* MAE = 47.66132358311639

---



---

- Time interval n.0: [427.96, 428.16]  
 \* y\_true: [33.16108667 24.70091575]  
 \* v\_ann: [28.78144073486328, 1.0717911545747588e-1  
 8, 37.34980306665185]

---

- Time interval n.1: [428.16, 428.36]  
 \* y\_true: [36.08159054 35.68166414]  
 \* v\_ann: [36.10935974121094, 7.081268334337432e-20,  
 37.34980306665185]

---

- Time interval n.2: [428.36, 428.56]  
 \* y\_true: [27.64533545 36.4184567 ]  
 \* v\_ann: [34.073272705078125, 9.0898838739361e-20,  
 37.34980306665185]

---

- Time interval n.3: [428.56, 428.76]  
 \* y\_true: [24.96174823 38.17283814]  
 \* v\_ann: [28.874820709228516, 7.170484933280105e-2

0, 37.34980306665185]

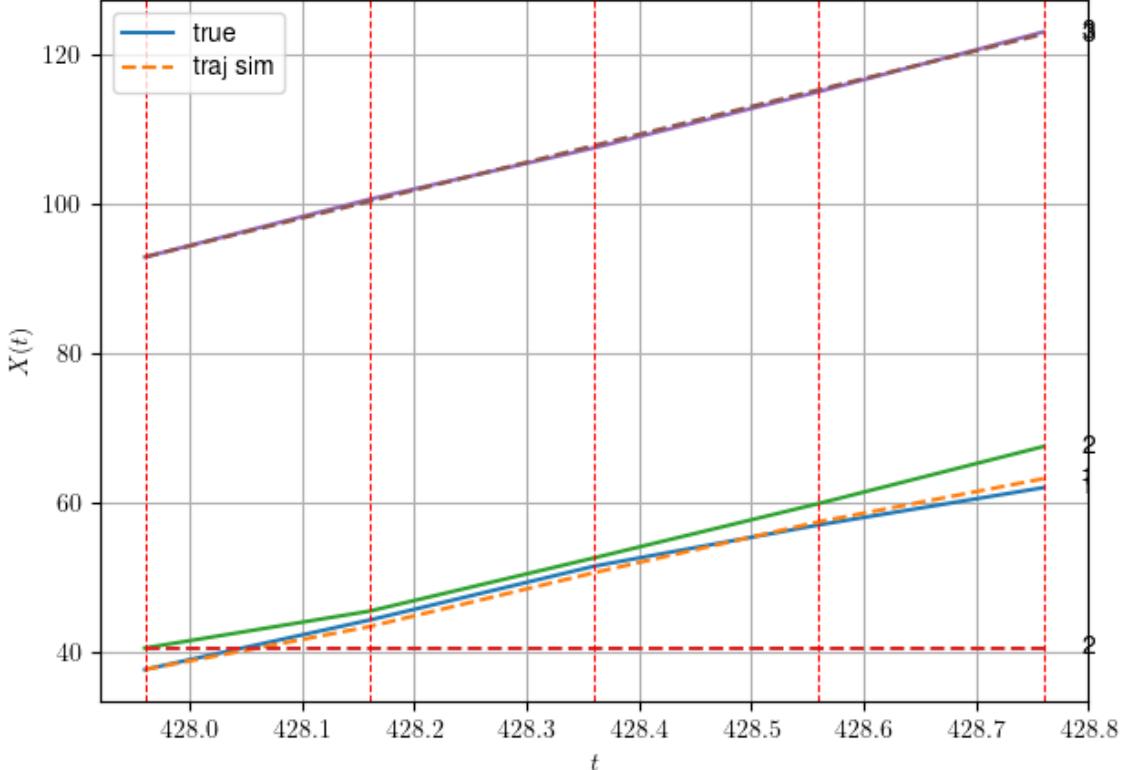
---



---

- \* err= 85.14931099405935
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 0.0006403139402948455

*df n. 3 – Scene n. 27, at it = 350*



For scene 27/55

- \* use LR\_NN=5e-05 with err=76.79812646461257 at it=19
- \* v0\_scn\_mean = 36.71987323345032
- \* MAE = 85.14931099405935

---



---

- Time interval n.0: [439.36, 439.56]
- \* y\_true: [29.12388438 22.06331107]
- \* v\_ann: [27.90685272216797, 28.012508392333984, 3  
3.53635301945251]

---



---

- Time interval n.1: [439.56, 439.76]
- \* y\_true: [38.07606081 22.99369197]
- \* v\_ann: [28.43059730529785, 23.972850799560547, 3  
3.53635301945251]

---



---

- Time interval n.2: [439.76, 439.96]
- \* y\_true: [23.98424021 18.65338098]
- \* v\_ann: [21.287994384765625, 24.952104568481445, 3  
3.53635301945251]

---



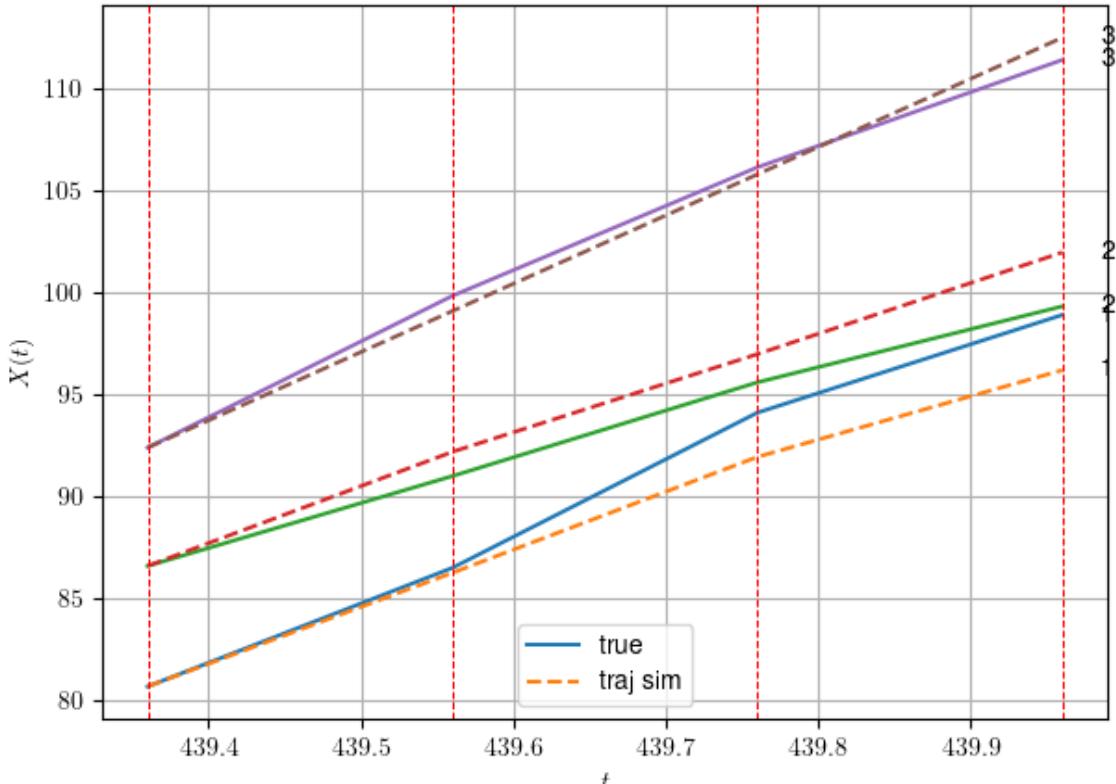
---

```

* err= 2.0279576113452875
* Learning rate NN = 0.0005904899444431067
* diff = 0.001332517811159839

```

*df n. 3 – Scene n. 28, at it = 350*



For scene 28/55

```

* use LR_NN=0.001 with err=13.354067747317659 at it=19
* v0_scn_mean = 33.23326268526436
* MAE = 1.2574167641953071

```

---



---

- Time interval n.0: [448.36, 448.56]  
\* y\_true: [32.70350359 27.85524745]  
\* v\_ann: [32.31513214111328, 32.74832534790039, 31.  
58503673308329]

---

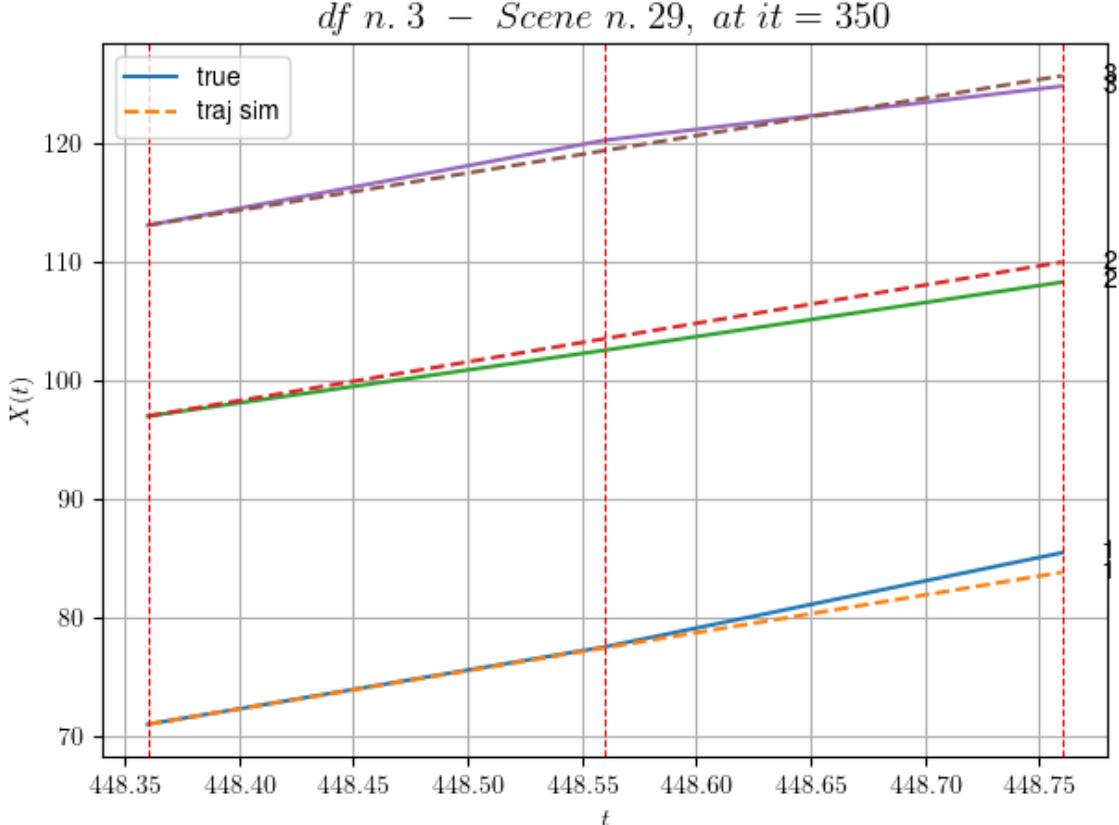
- Time interval n.1: [448.56, 448.76]  
\* y\_true: [39.76511656 28.75604876]  
\* v\_ann: [31.893911361694336, 32.33863067626953, 3  
1.58503673308329]

---

```

* err= 0.8996367767005665
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.0013936444854013574

```



For scene 29/55

\* use LR\_NN=5e-05 with err=0.6004903502222778 at it=19  
 \* v0\_scn\_mean = 31.449187933349894  
 \* MAE = 0.8996367767005665

---



---

- Time interval n.0: [465.16, 465.36]  
 \* y\_true: [25.95020905 30.0319773 ]  
 \* v\_ann: [5.555174105009025e-15, 1.4528812243952416  
 e-05, 24.722117202498676]

---

- Time interval n.1: [465.36, 465.56]  
 \* y\_true: [21.30025919 28.782318 ]  
 \* v\_ann: [2.2808327221259667e-15, 2.70342716248706e  
 -05, 24.722117202498676]

---

- Time interval n.2: [465.56, 465.76]  
 \* y\_true: [22.00036741 28.59272475]  
 \* v\_ann: [4.462830781230105e-16, 1.0551084415055811  
 e-05, 24.722117202498676]

---

- Time interval n.3: [465.76, 465.96]  
 \* y\_true: [26.90061063 23.70259195]  
 \* v\_ann: [1.0605608211831469e-16, 5.524973676074296

e-05, 24.722117202498676]

```

-----
- Time interval n.4: [465.96, 466.16]
  * y_true: [23.75070885 23.26288454]
  * v_ann: [2.1295464438179218e-16, 0.000464560929685
83107, 24.722117202498676]

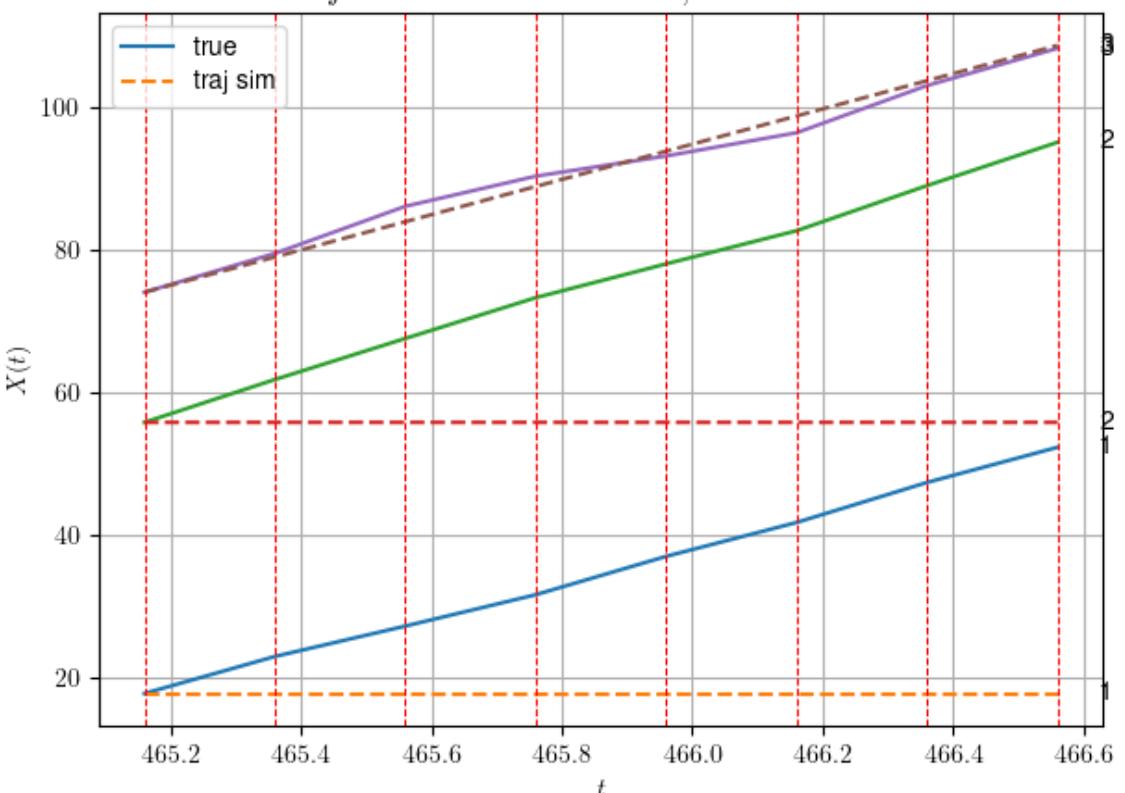
-----
- Time interval n.5: [466.16, 466.36]
  * y_true: [28.05107156 31.61450449]
  * v_ann: [2.3692657676159534e-16, 0.002191580366343
26, 24.722117202498676]

-----
- Time interval n.6: [466.36, 466.56]
  * y_true: [24.65117633 30.37492519]
  * v_ann: [1.0916027919898939e-16, 0.001584541052579
8798, 24.722117202498676]

-----
* err= 319.759306028679
* Learning rate NN = 0.00012709324073512107
* diff = 4 8229401337468735e-05

```

*df n. 3 – Scene n. 30, at it = 350*



For scene 30/55

```

* use LR_NN=0.0005 with err=65.2033781721621 at it=19
* v0_scn_mean = 25.17446889140034
* MAE = 43.67791921595191
=====
```

```
=====
- Time interval n.0: [467.16, 467.36]
  * y_true: [14.52040439 29.14139959]
  * v_ann: [19.842424392700195, 21.0917911529541, 20.
776329501781685]

-----
- Time interval n.1: [467.36, 467.56]
  * y_true: [ 8.96028804 21.01119683]
  * v_ann: [19.197521209716797, 19.919719696044922, 2
0.776329501781685]

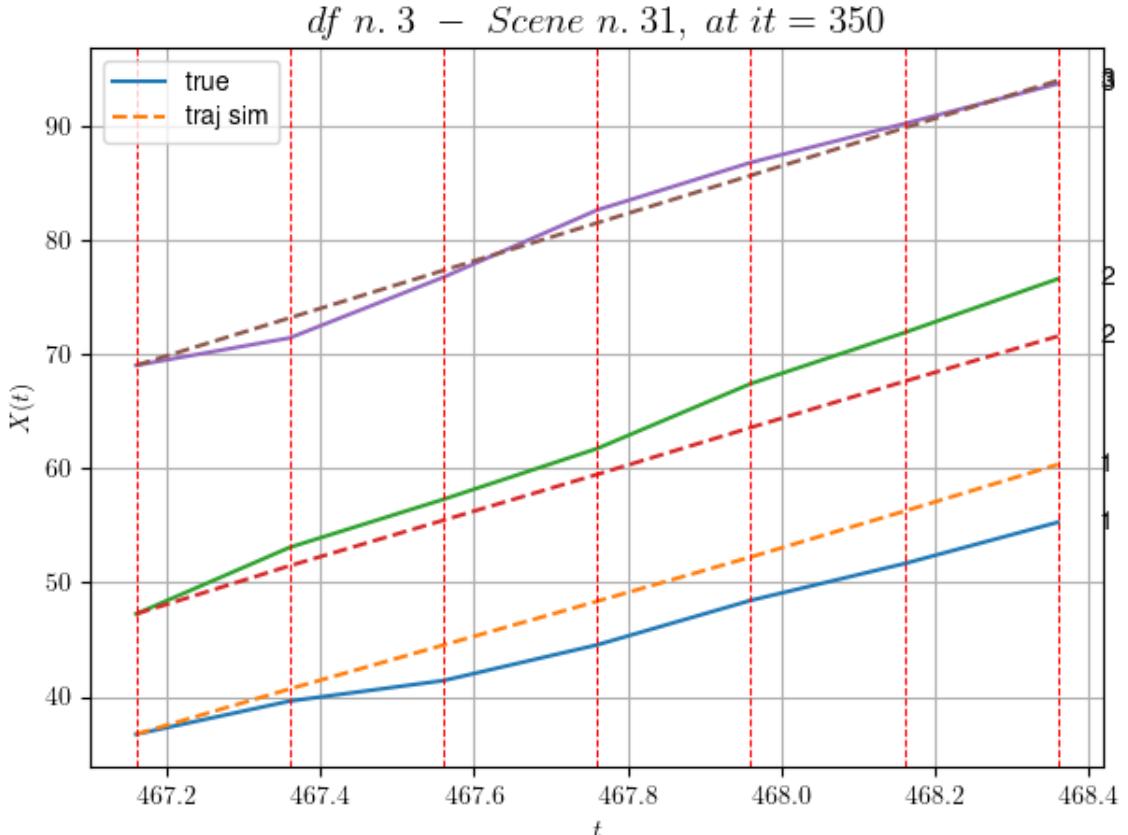
-----
- Time interval n.2: [467.56, 467.76]
  * y_true: [15.62056342 22.22157858]
  * v_ann: [19.15242576599121, 20.045433044433594, 2
0.776329501781685]

-----
- Time interval n.3: [467.76, 467.96]
  * y_true: [19.48080782 28.40220095]
  * v_ann: [19.37481117248535, 20.527048110961914, 2
0.776329501781685]

-----
- Time interval n.4: [467.96, 468.16]
  * y_true: [16.10078185 22.34213456]
  * v_ann: [20.06639289855957, 20.19317054748535, 20.
776329501781685]

-----
- Time interval n.5: [468.16, 468.36]
  * y_true: [18.12099432 23.56241547]
  * v_ann: [20.444509506225586, 19.813949584960938, 2
0.776329501781685]

-----
* err= 7.706117001916102
* Learning rate NN = 3.138104875688441e-05
* diff = 0.0433852072191625
```



For scene 31/55

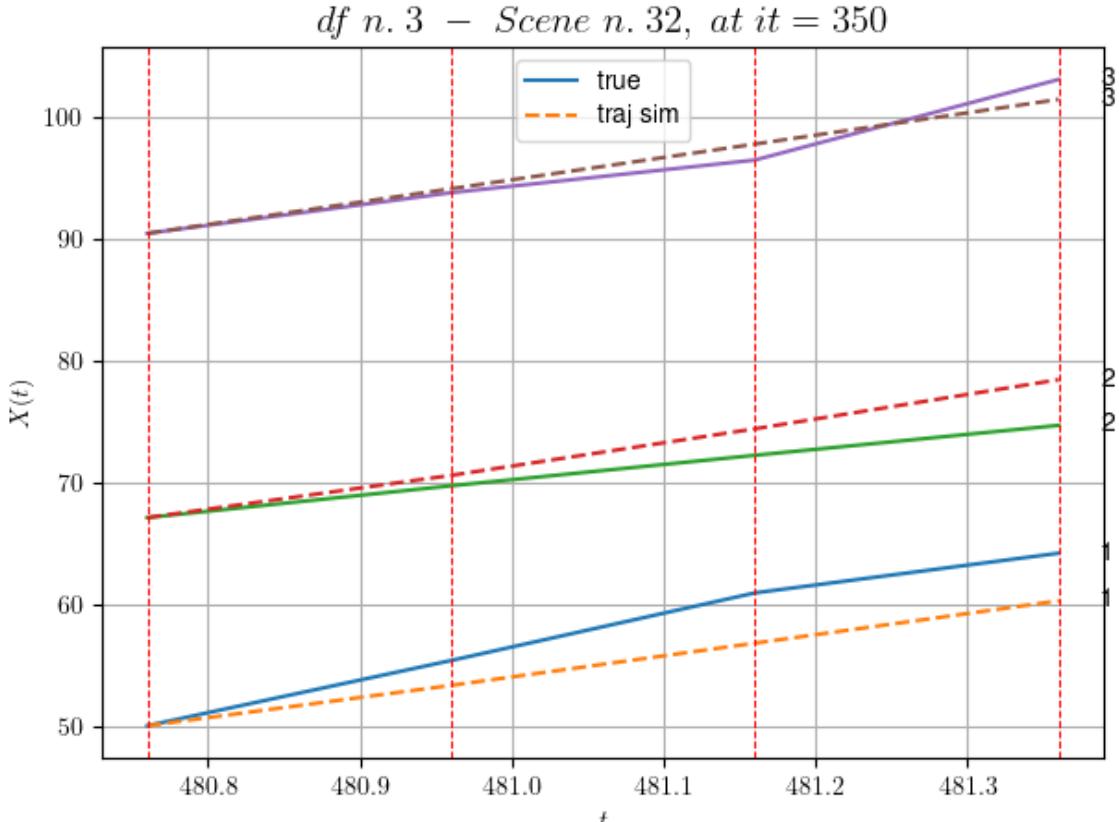
\* use LR\_NN=0.0001 with err=15.992296201031792 at it=19  
 \* v0\_scn\_mean = 21.56686295768007  
 \* MAE = 7.706117001916102

- Time interval n.0: [480.76, 480.96]  
 \* y\_true: [26.72145209 13.04113053]  
 \* v\_ann: [16.51922607421875, 17.309335708618164, 1  
 8.304926244694727]

- Time interval n.1: [480.96, 481.16]  
 \* y\_true: [27.70182882 12.50117676]  
 \* v\_ann: [17.312271118164062, 19.085525512695312, 1  
 8.304926244694727]

- Time interval n.2: [481.16, 481.36]  
 \* y\_true: [16.26121495 12.26123448]  
 \* v\_ann: [17.35651206970215, 20.132381439208984, 1  
 8.304926244694727]

\* err= 5.023829580829371  
 \* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.004630791706436099



For scene 32/55

- \* use LR\_NN=0.0005 with err=15.345183053092782 at it=19
- \* v0\_scn\_mean = 19.307276347569537
- \* MAE = 5.023829580829371

---



---

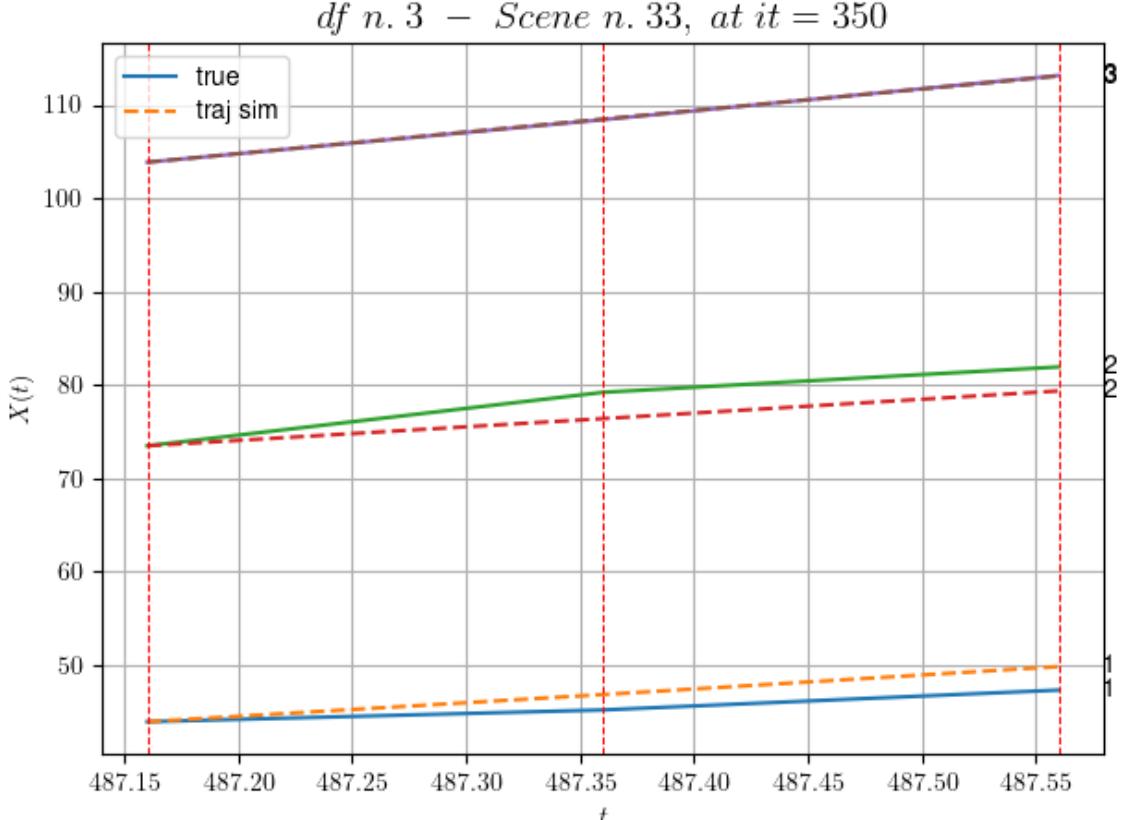
- Time interval n.0: [487.16, 487.36]
- \* y\_true: [ 6.3002445 28.62315801]
- \* v\_ann: [14.532510757446289, 14.547280311584473, 2 3.071881683469584]

---

- Time interval n.1: [487.36, 487.56]
- \* y\_true: [10.63044184 13.60161023]
- \* v\_ann: [14.976936340332031, 14.833110809326172, 2 3.071881683469584]

---

- \* err= 2.6191315136257063
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 0.0001974670327373751



For scene 33/55

- \* use LR\_NN=5e-05 with err=3.8868094323501086 at it=19
- \* v0\_scn\_mean = 23.665670166773314
- \* MAE = 2.6191315136257063

---



---

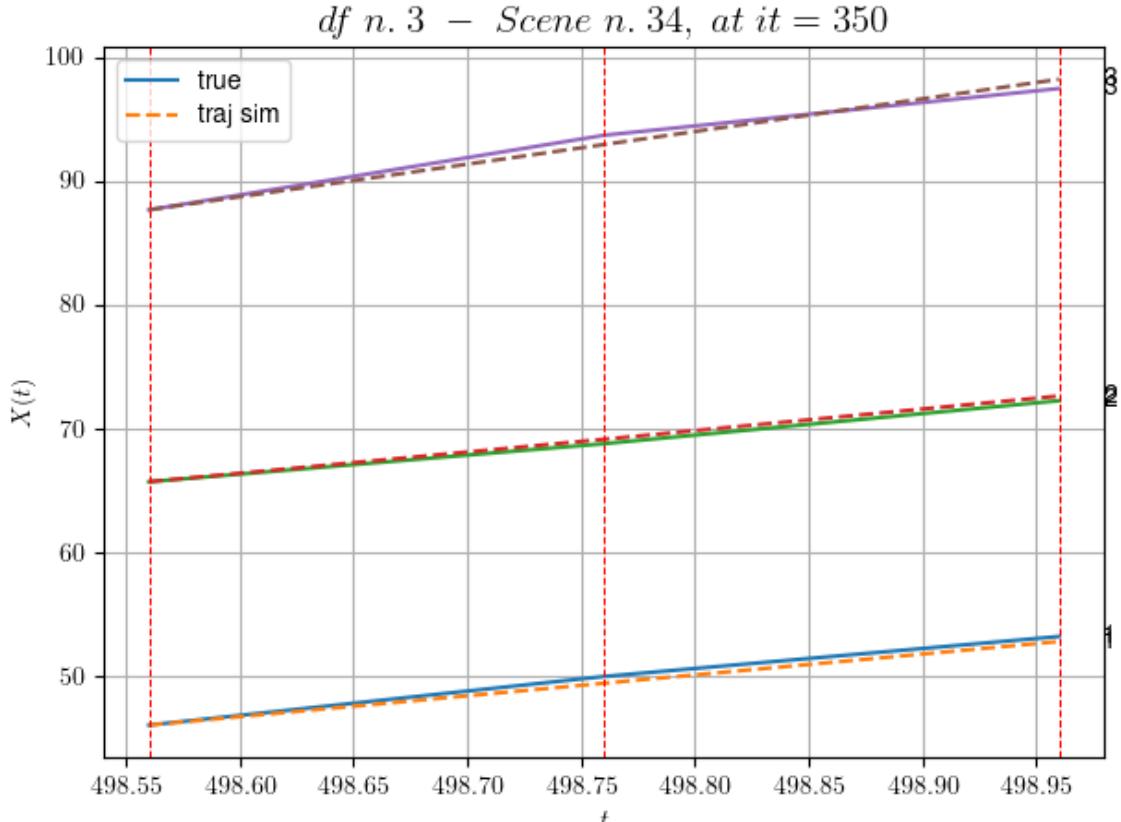
- Time interval n.0: [498.56, 498.76]
- \* y\_true: [19.66086018 15.38134444]
- \* v\_ann: [16.93297004699707, 17.164981842041016, 2  
6.404288947134958]

---

- Time interval n.1: [498.76, 498.96]
- \* y\_true: [16.17082592 17.38167269]
- \* v\_ann: [16.875516891479492, 17.499223709106445, 2  
6.404288947134958]

---

- \* err= 0.20650223811842763
- \* Learning rate NN = 3.6449993785936385e-05
- \* diff = 4.968732736215786e-05



For scene 34/55

\* use LR\_NN=5e-05 with err=0.8419566579375924 at it=19

\* v0\_scn\_mean = 26.712466682406937

\* MAE = 0.20650223811842763

---



---

- Time interval n.0: [517.96, 518.16]  
 \* y\_true: [11.01062169 17.99135838]  
 \* v\_ann: [14.213898658752441, 13.390511512756348, 1  
 3.435858379544593]

---



---



---

- Time interval n.1: [518.16, 518.36]  
 \* y\_true: [13.11081201 12.94110202]  
 \* v\_ann: [13.300128936767578, 14.1123046875, 13.435  
 858379544593]

---

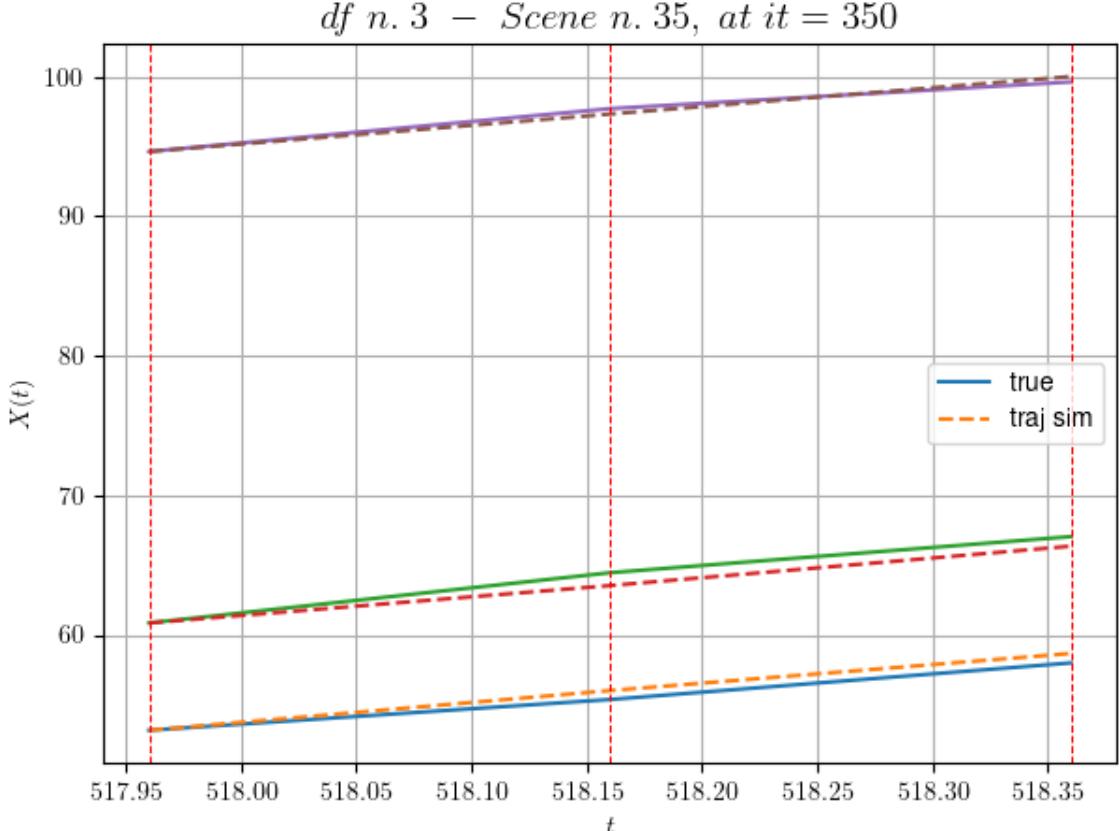


---



---

\* err= 0.27646702281787433  
 \* Learning rate NN = 0.0007289999630302191  
 \* diff = 2.6343750517299203e-05



For scene 35/55

```
* use LR_NN=0.001 with err=7.300986513134377 at it=19
* v0_scn_mean = 14.855521855353429
* MAE = 0.2762161268142105
```

---



---

```
- Time interval n.0: [527.36, 527.56]
* y_true: [14.45064103 23.0016556 ]
* v_ann: [16.72607421875, 16.75476837158203, 16.921
000530114533]
```

---

```
- Time interval n.1: [527.56, 527.76]
* y_true: [16.14079976 10.04077962]
* v_ann: [16.86724090576172, 16.76889419555664, 16.
921000530114533]
```

---

```
- Time interval n.2: [527.76, 527.96]
* y_true: [12.25068777 19.3317022 ]
* v_ann: [16.691455841064453, 16.68570327758789, 1
6.921000530114533]
```

---

```
- Time interval n.3: [527.96, 528.16]
* y_true: [17.36107311 21.34208771]
* v_ann: [16.776103973388672, 16.669281005859375, 1
```

6.921000530114533]

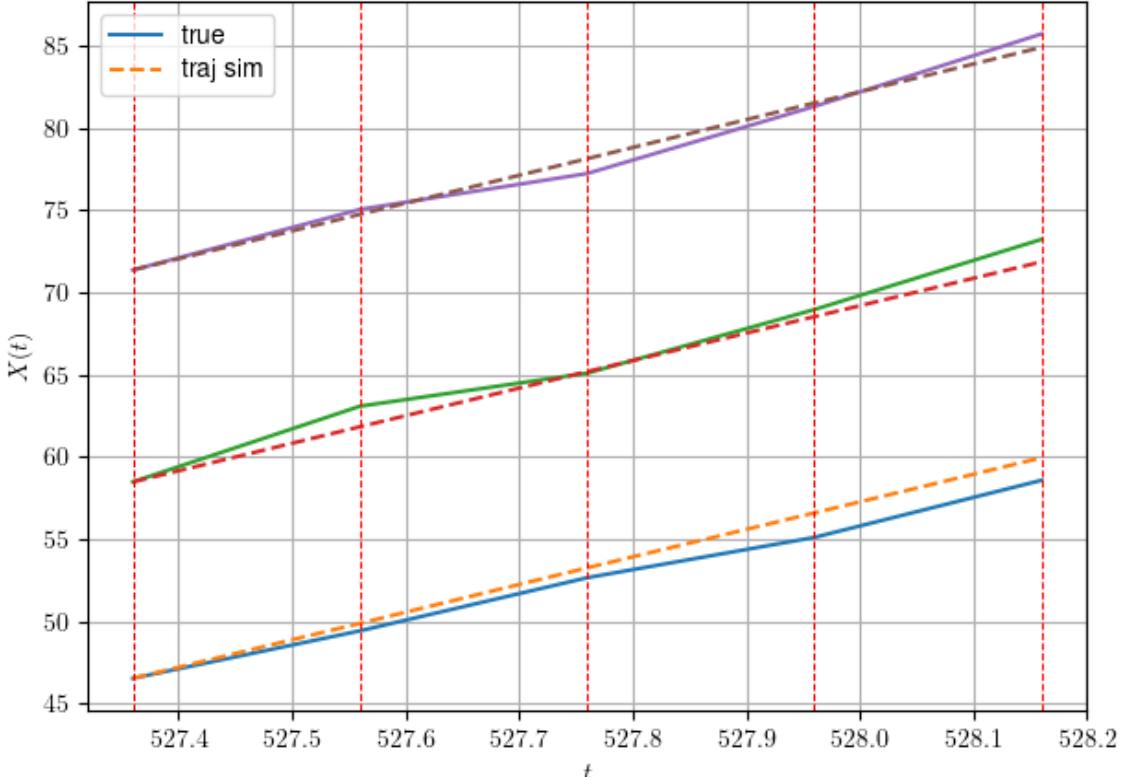
---



---

- \* err= 0.6605227940481666
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 1.663275904073558e-05

*df n. 3 – Scene n. 36, at it = 350*



For scene 36/55

- \* use LR\_NN=5e-05 with err=14.099541717928021 at it=19
- \* v0\_scn\_mean = 18.041962803496954
- \* MAE = 0.6586993885323132

---



---

- Time interval n.0: [530.36, 530.56]
- \* y\_true: [16.07060164 26.13260896]
- \* v\_ann: [19.9601993560791, 19.120834350585938, 18.054941466396027]

---



---

- Time interval n.1: [530.56, 530.76]
- \* y\_true: [15.14064363 18.85215172]
- \* v\_ann: [20.4320011138916, 19.00345802307129, 18.054941466396027]

---



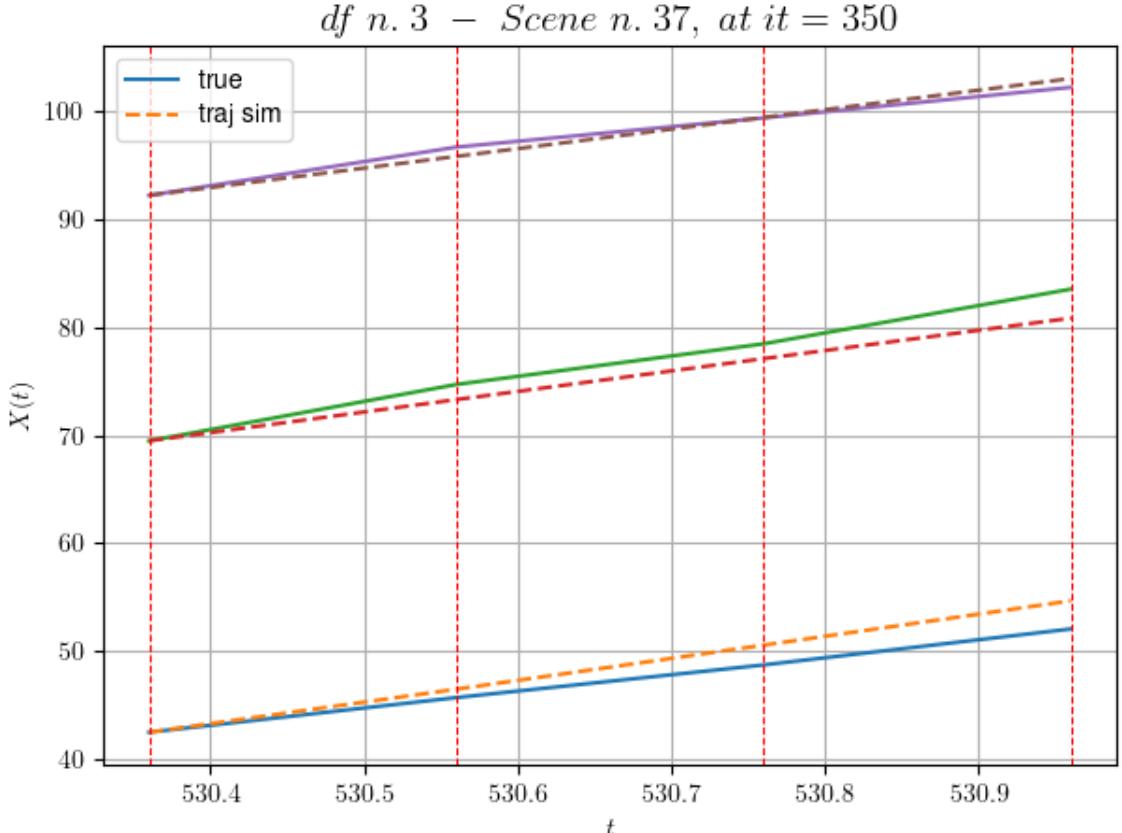
---

- Time interval n.2: [530.76, 530.96]
- \* y\_true: [16.69081323 25.36324467]
- \* v\_ann: [20.561498641967773, 18.77197265625, 18.054941466396027]

```

* err= 1.9411060206364565
* Learning rate NN = 5.9048988987342454e-06
* diff = 0.0008335363883693603

```



For scene 37/55

```

* use LR_NN=1e-05 with err=10.805670629865437 at it=19
* v0_scn_mean = 19.078717023567016
* MAE = 1.9411060206364565

```

- 
- 
- Time interval n.0: [576.56, 576.76]
    - \* y\_true: [22.12000755 22.50086521]
    - \* v\_ann: [23.146469116210938, 22.228303909301758, 21.51674944574931]
- 
- 
- Time interval n.1: [576.76, 576.96]
    - \* y\_true: [22.90003133 17.69083 ]
    - \* v\_ann: [23.037809371948242, 22.194673538208008, 21.51674944574931]
- 
- 
- Time interval n.2: [576.96, 577.16]
    - \* y\_true: [24.57008129 24.8113942 ]
    - \* v\_ann: [22.36356544494629, 21.75132942199707, 21.51674944574931]

```

-----  

- Time interval n.3: [577.16, 577.36]  

* y_true: [26.44016601 28.10183764]  

* v_ann: [22.977008819580078, 22.142349243164062, 2  

1.51674944574931]
-----
```

```

-----  

- Time interval n.4: [577.36, 577.56]  

* y_true: [27.01028631 17.73134123]  

* v_ann: [24.14016342163086, 22.776355743408203, 2  

1.51674944574931]
-----
```

```

-----  

- Time interval n.5: [577.56, 577.76]  

* y_true: [28.59045436 12.12102827]  

* v_ann: [23.665613174438477, 22.730436325073242, 2  

1.51674944574931]
-----
```

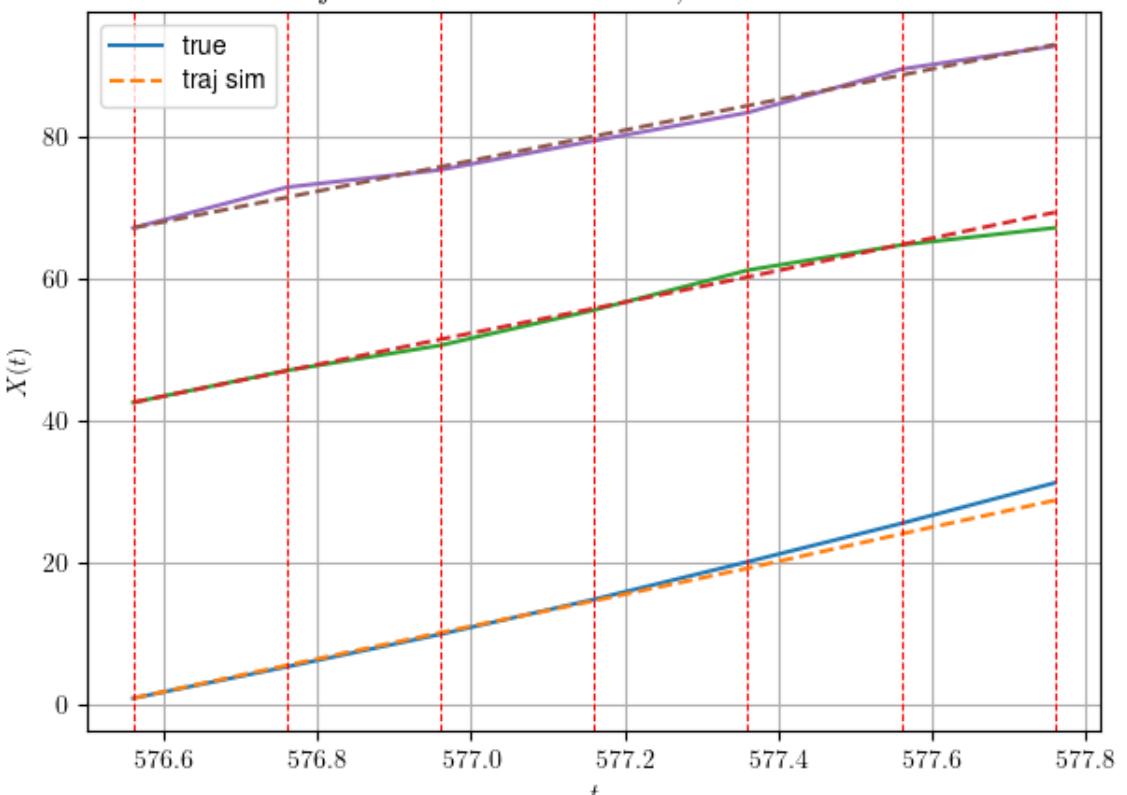
```

* err= 0.9491739673258682  

* Learning rate NN = 3.138104875688441e-05  

* diff = 0.0070436676279203025
```

*df n. 3 – Scene n. 38, at it = 350*



For scene 38/55

```

* use LR_NN=0.0001 with err=19.64741848447939 at it=19
* v0_scn_mean = 22.24382370313931
* MAE = 0.7624929309290956
=====
```

```
=====
- Time interval n.0: [579.56, 579.76]
  * y_true: [21.03058275 42.18516565]
  * v_ann: [25.253629684448242, 23.780235290527344, 2
5.358438002860318]

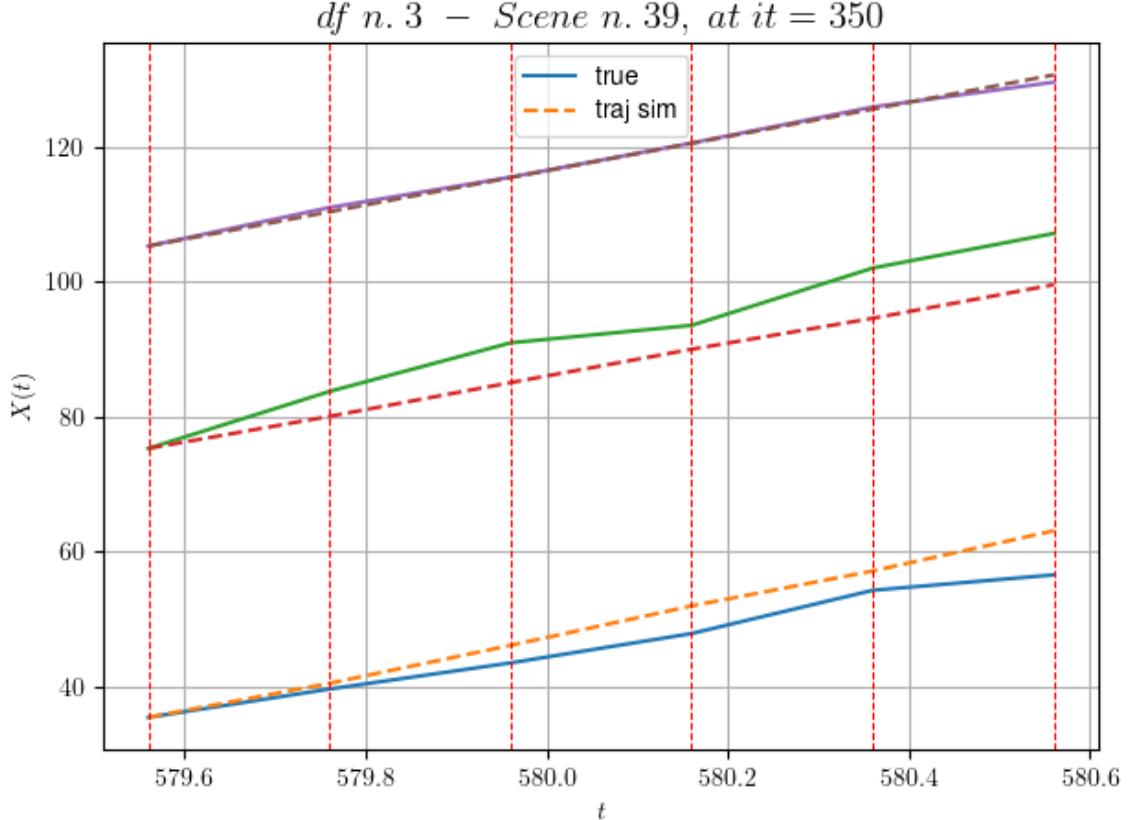
-----
- Time interval n.1: [579.76, 579.96]
  * y_true: [19.36065083 36.06520173]
  * v_ann: [28.12603759765625, 24.97986602783203, 25.
358438002860318]

-----
- Time interval n.2: [579.96, 580.16]
  * y_true: [21.76088956 12.96224398]
  * v_ann: [29.208776473999023, 24.719045639038086, 2
5.358438002860318]

-----
- Time interval n.3: [580.16, 580.36]
  * y_true: [32.02164742 42.42773504]
  * v_ann: [25.913253784179688, 22.958566665649414, 2
5.358438002860318]

-----
- Time interval n.4: [580.36, 580.56]
  * y_true: [11.44064385 25.66536311]
  * v_ann: [29.764305114746094, 24.87648582458496, 2
5.358438002860318]

-----
* err= 13.926828356742837
* Learning rate NN = 3.874203684972599e-05
* diff = 0.037257845242722354
```



For scene 39/55

\* use LR\_NN=0.0001 with err=37.23438832373244 at it=19

\* v0\_scn\_mean = 25.756252522262553

\* MAE = 13.926828356742837

---



---

- Time interval n.0: [592.16, 592.36]  
 \* y\_true: [ 4.45046478 21.56401461]  
 \* v\_ann: [16.263816833496094, 15.010947227478027, 2  
 4.71001897344754]

---

- Time interval n.1: [592.36, 592.56]  
 \* y\_true: [14.40168088 21.61284101]  
 \* v\_ann: [10.636551856994629, 15.607162475585938, 2  
 4.71001897344754]

---

- Time interval n.2: [592.56, 592.76]  
 \* y\_true: [14.40168088 22.933287 ]  
 \* v\_ann: [12.698363304138184, 15.738348960876465, 2  
 4.71001897344754]

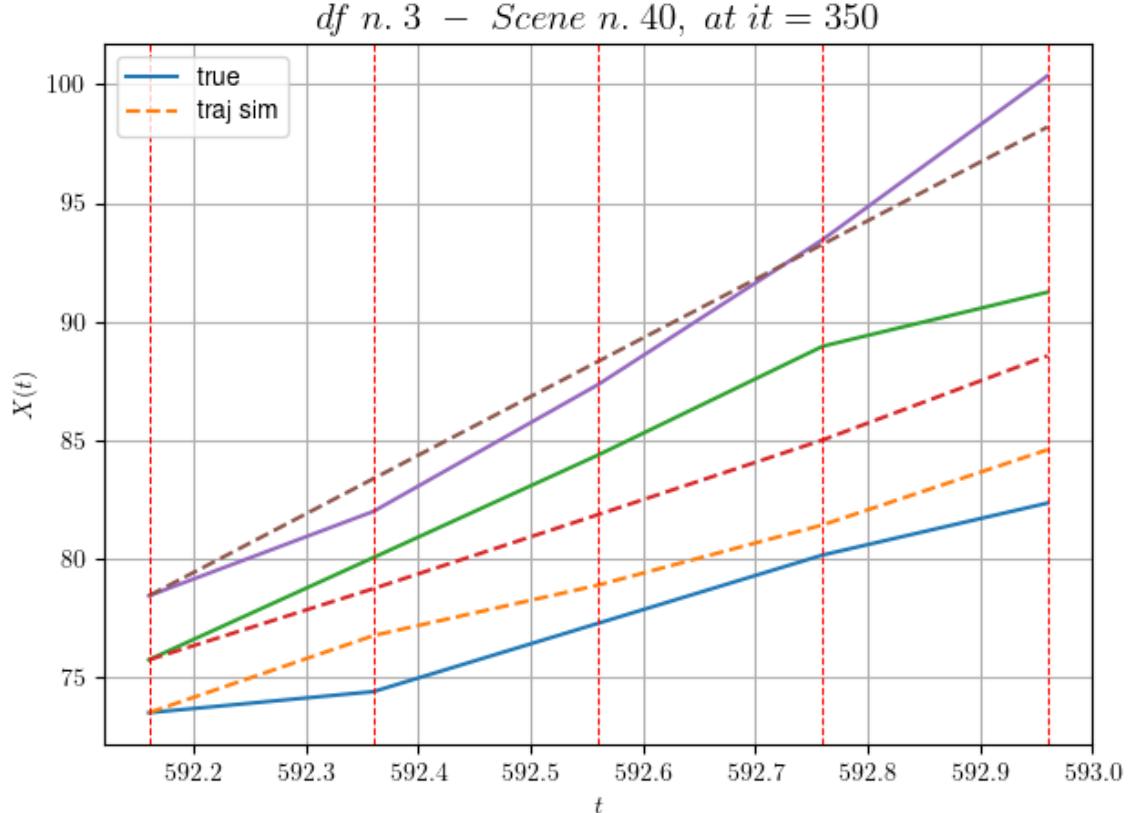
---

- Time interval n.3: [592.76, 592.96]  
 \* y\_true: [10.94538603 11.39186219]  
 \* v\_ann: [15.845694541931152, 17.74795913696289, 2  
 4.71001897344754]

```

* err= 3.5478355487976194
* Learning rate NN = 0.002391484100371599
* diff = 0.0007768488110806437

```



For scene 40/55

```

* use LR_NN=0.005 with err=13.241681213710935 at it=19
* v0_scn_mean = 25.163407565696268
* MAE = 2.8596409661356925

```

---



---

- Time interval n.0: [21.56, 21.76]  
\* y\_true: [26.48927836 26.93283237 27.60013316]  
\* v\_ann: [23.46121597290039, 27.52960205078125, 22.  
851274490356445, 29.083788662827413]

---



---

- Time interval n.1: [21.76, 21.96]  
\* y\_true: [24.19440937 24.35304119 22.73494812]  
\* v\_ann: [23.63699722290039, 27.817882537841797, 2  
2.972164154052734, 29.083788662827413]

---

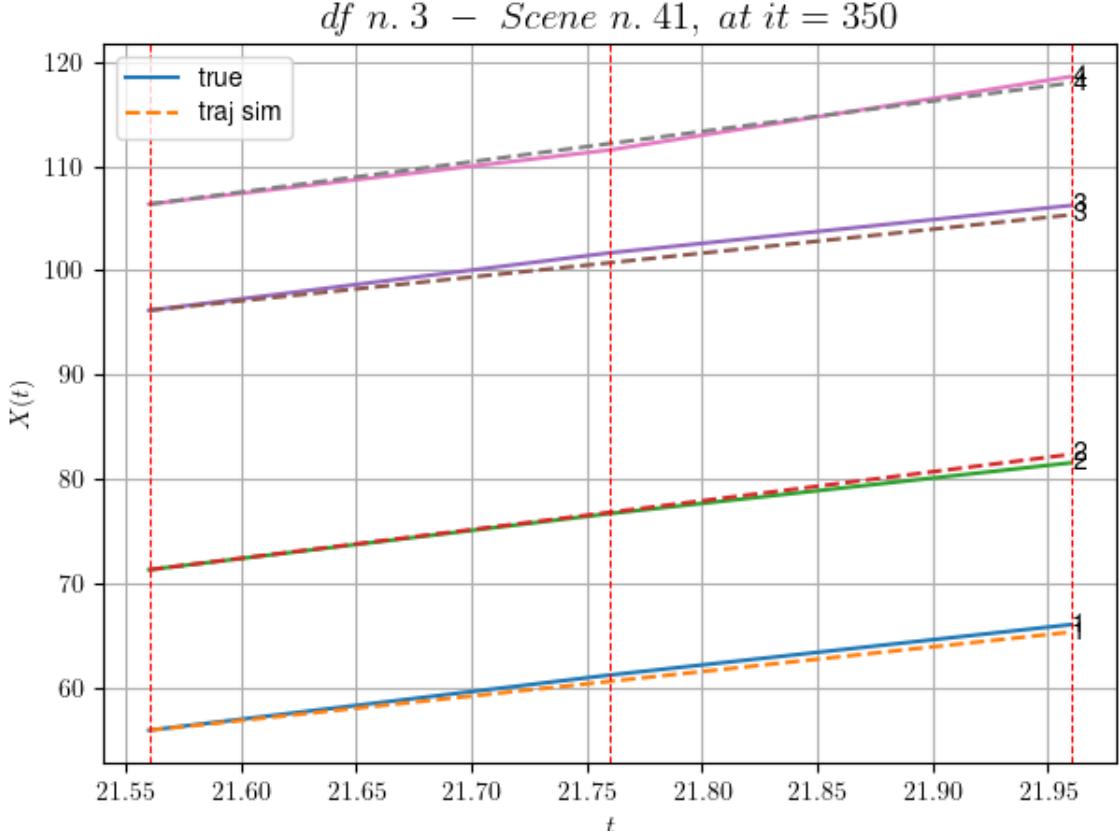


---

```

* err= 0.3353478090967013
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.016084336847995873

```



For scene 41/55

\* use LR\_NN=5e-05 with err=3.7495578393338467 at it=19  
 \* v0\_scn\_mean = 29.188365659888323  
 \* MAE = 0.3353478090967013

---



---

- Time interval n.0: [31.36, 31.56]  
 \* y\_true: [24.92105739 19.11766565 26.56610692]  
 \* v\_ann: [19.026641845703125, 21.695663452148438, 2  
 3.07142448425293, 30.91704367792894]

---

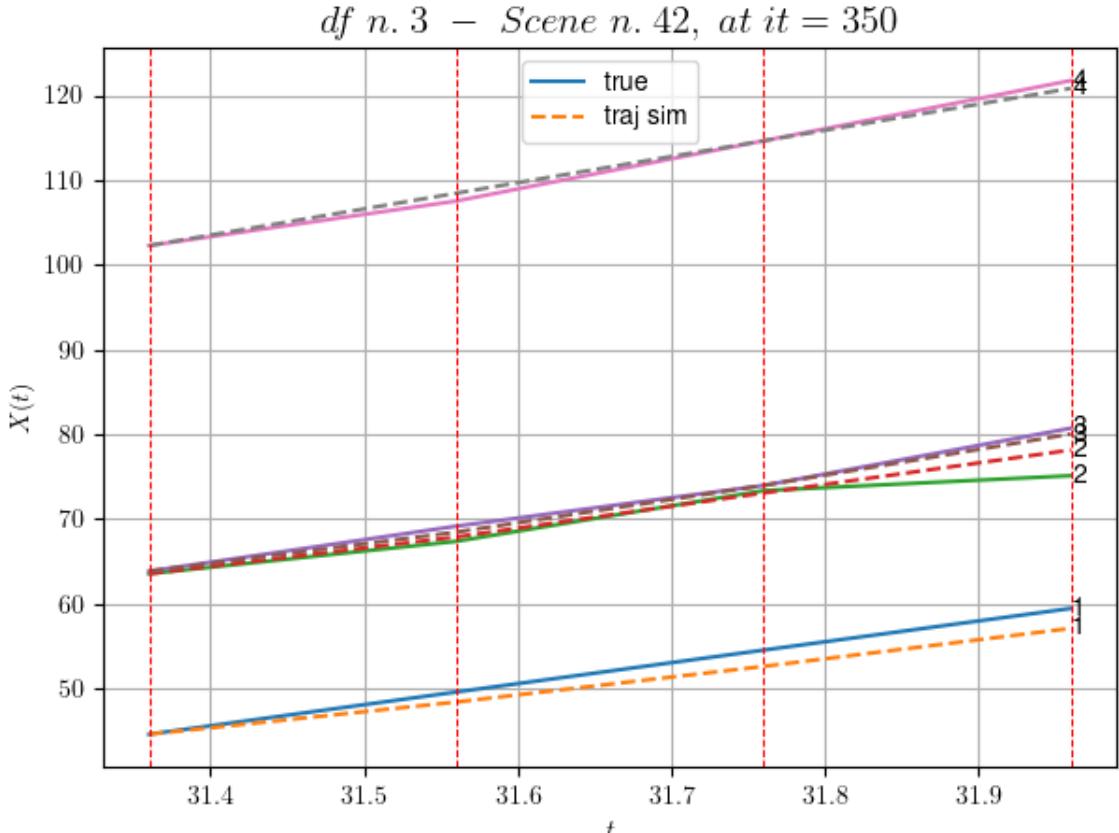
- Time interval n.1: [31.56, 31.76]  
 \* y\_true: [24.72130541 29.91666352 24.00857353]  
 \* v\_ann: [21.012619018554688, 25.920867919921875, 2  
 7.516693115234375, 30.91704367792894]

---

- Time interval n.2: [31.76, 31.96]  
 \* y\_true: [24.58151426 8.80091982 33.80389928]  
 \* v\_ann: [22.43848991394043, 25.3758602142334, 30.3  
 99829864501953, 30.91704367792894]

---

\* err= 1.4242355656819932  
 \* Learning rate NN = 0.0005904899444431067  
 \* diff = 0.8589330767168866



For scene 42/55

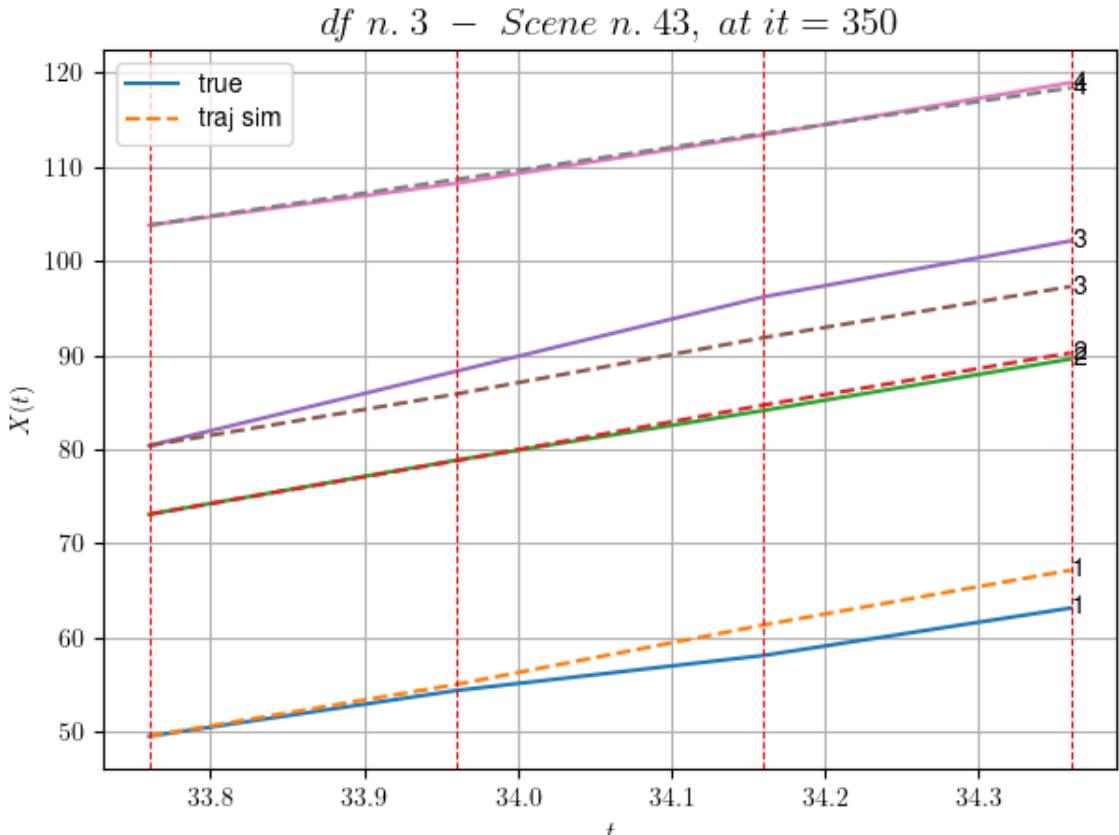
\* use LR\_NN=0.001 with err=9.373669774259064 at it=19  
 \* v0\_scn\_mean = 30.812371676917227  
 \* MAE = 1.1648427935481462

- Time interval n.0: [33.76, 33.96]  
 \* y\_true: [24.27120267 28.75319668 39.53553599]  
 \* v\_ann: [27.483078002929688, 28.42693328857422, 2  
 7.44293212890625, 24.316455544260645]

- Time interval n.1: [33.96, 34.16]  
 \* y\_true: [18.63110748 26.36338094 39.47623422]  
 \* v\_ann: [31.602825164794922, 29.59503936767578, 2  
 9.927692413330078, 24.316455544260645]

- Time interval n.2: [34.16, 34.36]  
 \* y\_true: [25.20172426 27.37399424 29.73574355]  
 \* v\_ann: [29.115510940551758, 27.71795082092285, 2  
 7.141616821289062, 24.316455544260645]

\* err= 4.774537206597091  
 \* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.00605968783460753



For scene 43/55

\* use LR\_NN=0.0005 with err=15.049646358352739 at it=19  
 \* v0\_scn\_mean = 24.96517924776504  
 \* MAE = 4.335532761931224

---



---

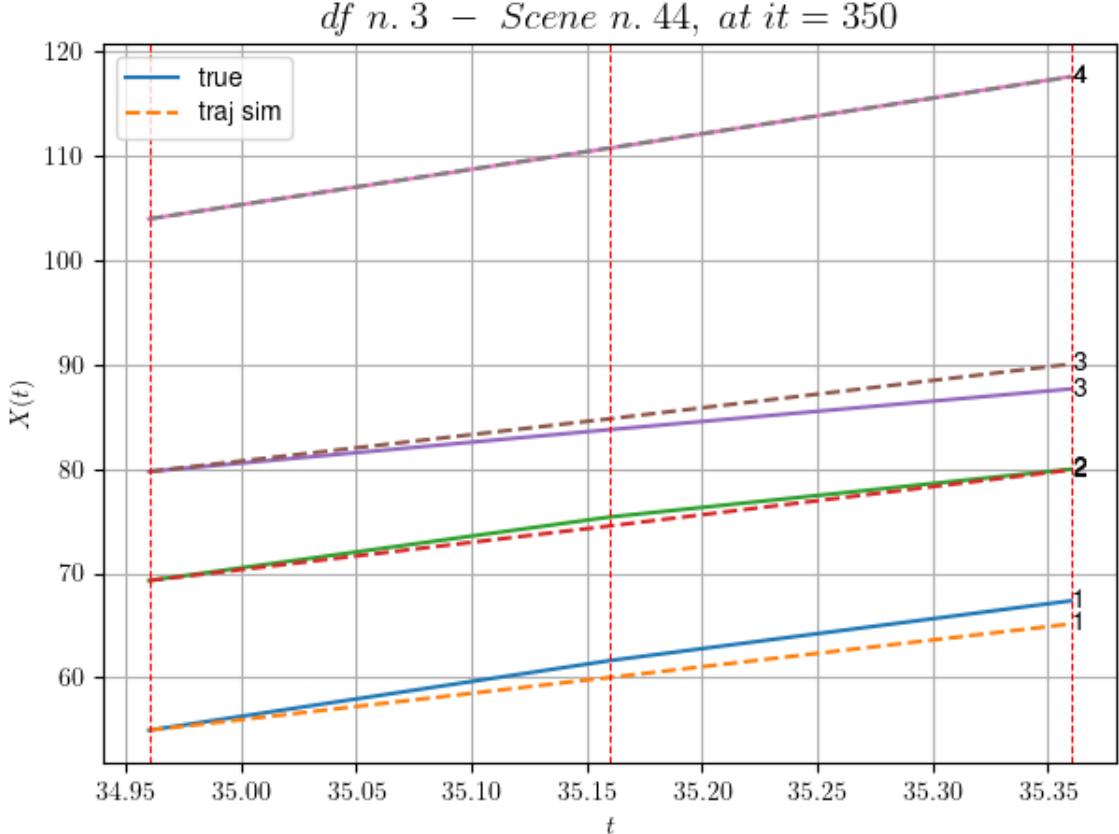
- Time interval n.0: [34.96, 35.16]  
 \* y\_true: [33.40218228 30.49313647 20.11252108]  
 \* v\_ann: [25.324371337890625, 26.20924949645996, 2  
 5.315114974975586, 34.043949579976285]

---

- Time interval n.1: [35.16, 35.36]  
 \* y\_true: [28.66899207 22.90260208 19.5026699 ]  
 \* v\_ann: [25.64698028564453, 26.855100631713867, 2  
 6.21670150756836, 34.043949579976285]

---

\* err= 1.2534702201402417  
 \* Learning rate NN = 3.6449993785936385e-05  
 \* diff = 0.0014874416225398868



For scene 44/55

\* use LR\_NN=5e-05 with err=9.762593232783901 at it=19  
 \* v0\_scn\_mean = 33.58237037201238  
 \* MAE = 1.2534702201402417

---



---

- Time interval n.0: [83.36, 83.56]
  - \* y\_true: [27.1108197 22.97496526 13.79424223]
  - \* v\_ann: [28.481985092163086, 27.52761459350586, 2 8.944286346435547, 26.108277505261114]
- Time interval n.1: [83.56, 83.76]
  - \* y\_true: [28.73111951 35.1785896 26.83859352]
  - \* v\_ann: [27.97480010986328, 27.648269653320312, 2 8.77462387084961, 26.108277505261114]
- Time interval n.2: [83.76, 83.96]
  - \* y\_true: [29.25142438 34.77932949 18.27648805]
  - \* v\_ann: [28.246444702148438, 27.91913604736328, 2 8.527015686035156, 26.108277505261114]
- Time interval n.3: [83.96, 84.16]
  - \* y\_true: [27.70171969 23.46694627 45.36715188]
  - \* v\_ann: [28.321027755737305, 28.370908737182617, 2

8.394756317138672, 26.108277505261114]

---

- Time interval n.4: [84.16, 84.36]
  - \* y\_true: [26.72197507 21.43687952 37.53588876]
  - \* v\_ann: [28.453880310058594, 27.819860458374023, 2 9.092397689819336, 26.108277505261114]

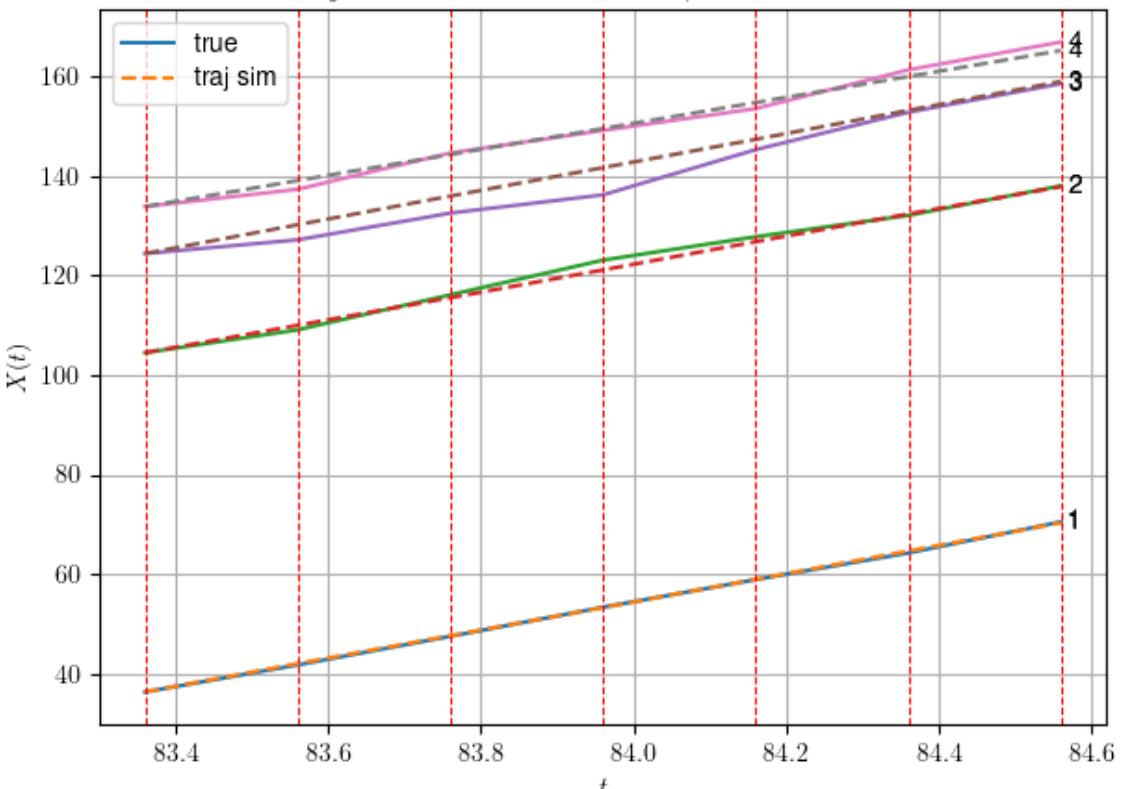
---

- Time interval n.5: [84.36, 84.56]
  - \* y\_true: [31.24277517 29.71036516 28.7233215 ]
  - \* v\_ann: [28.344133377075195, 27.38839340209961, 2 9.054676055908203, 26.108277505261114]

---

- \* err= 2.5493863457849018
- \* Learning rate NN = 3.138104830213706e-06
- \* diff = 0.00016553427741117233

*df n. 3 – Scene n. 45, at it = 350*



For scene 45/55

- \* use LR\_NN=1e-05 with err=99.85995076571008 at it=19
- \* v0\_scn\_mean = 26.552481408205743
- \* MAE = 2.4605731486143356

---



---

- Time interval n.0: [94.36, 94.56]
  - \* y\_true: [33.70387327 38.57908217 21.70251029]
  - \* v\_ann: [29.64695930480957, 29.951313018798828, 2

9.470287322998047, 29.526223424799525]

---

- Time interval n.1: [94.56, 94.76]
  - \* y\_true: [29.14386677 24.50535727 32.05702124]
  - \* v\_ann: [32.566627502441406, 28.39508628845215, 32.88042068481445, 29.526223424799525]

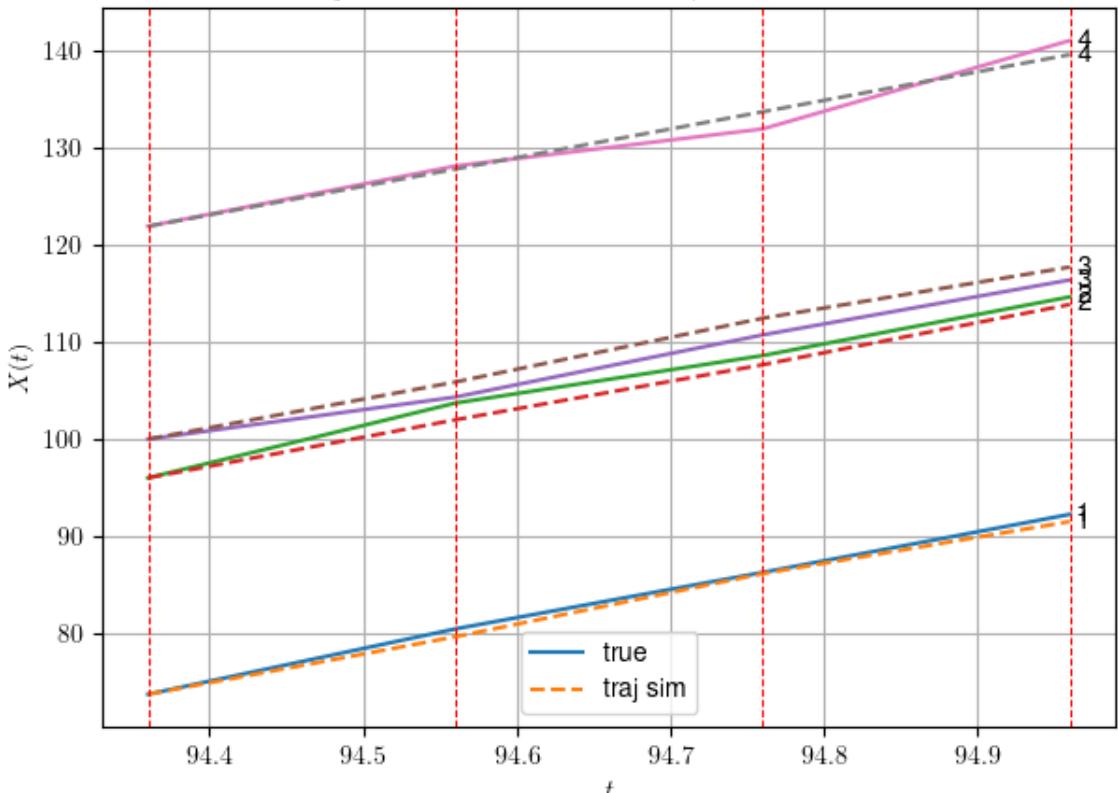
---

- Time interval n.2: [94.76, 94.96]
  - \* y\_true: [29.96461386 30.28702151 28.36707369]
  - \* v\_ann: [26.90121841430664, 31.098295211791992, 26.42866325378418, 29.526223424799525]

---

- \* err= 1.1361302641156306
- \* Learning rate NN = 0.0005904899444431067
- \* ~~diff = 0.00000015600503014E~~

*df n. 3 – Scene n. 46, at it = 350*



For scene 46/55

- \* use LR\_NN=0.001 with err=21.570903914841743 at it=19
- \* v0\_scn\_mean = 29.580300611472712
- \* MAE = 1.1361302641156306

---



---

- Time interval n.0: [142.16, 142.36]
  - \* y\_true: [31.90177154 33.47450881 19.84324761]
  - \* v\_ann: [25.169174194335938, 25.40439796447754, 25.810129165649414, 28.12150482470027]

```

-----  

-----  

    - Time interval n.1: [142.36, 142.56]  

      * y_true: [31.50218522 24.08376432 24.27420294]  

      * v_ann: [26.284008026123047, 27.083982467651367, 2  

    7.415355682373047, 28.12150482470027]

```

```

-----  

-----  

    - Time interval n.2: [142.56, 142.76]  

      * y_true: [24.70204715 30.9853993 17.45337402]  

      * v_ann: [26.095600128173828, 27.01653289794922, 2  

    7.33316421508789, 28.12150482470027]

```

```

-----  

-----  

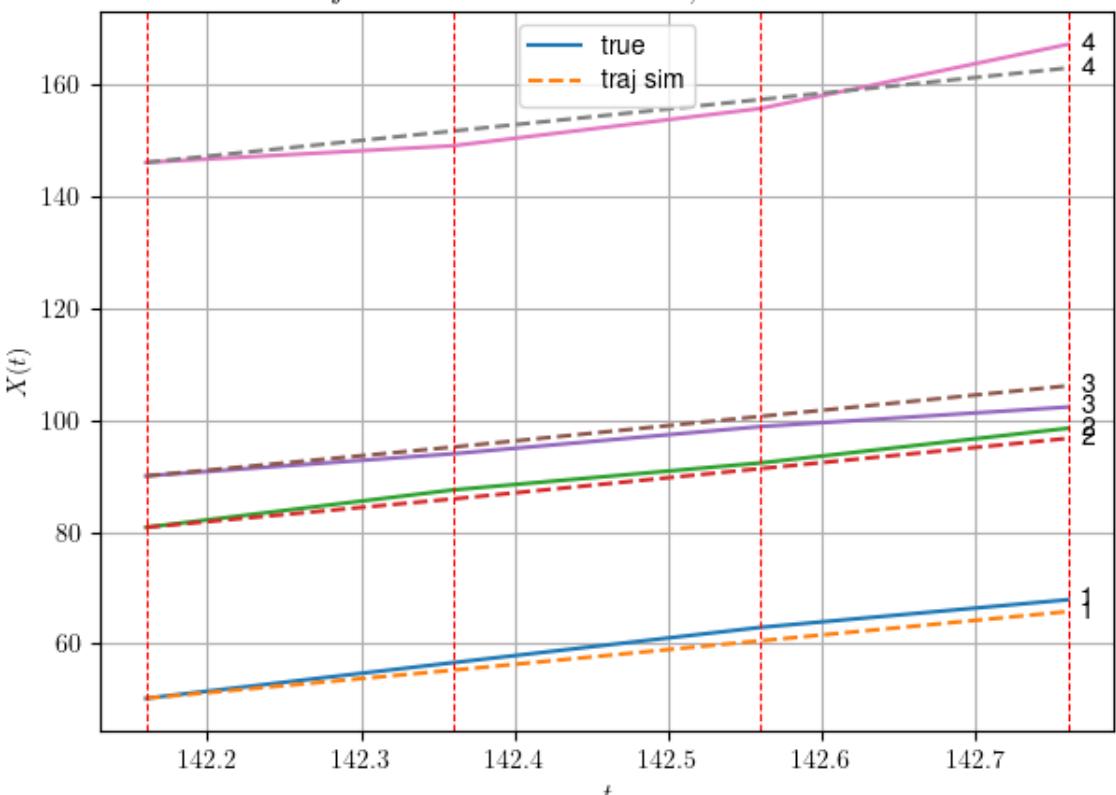
    * err= 4.097734903752793  

    * Learning rate NN = 5.904899080633186e-05  

    * diff = 0.003893509602602485

```

*df n. 3 – Scene n. 47, at it = 350*



For scene 47/55

```

* use LR_NN=0.0001 with err=32.77198953728207 at it=19  

* v0_scn_mean = 28.33591756601419  

* MAE = 4.097734903752793

```

```

=====  

-----  

    - Time interval n.0: [170.36, 170.56]  

      * y_true: [24.1106547 30.95205085 31.86307572]  

      * v_ann: [25.548641204833984, 25.634492874145508, 2  

    5.48127555847168, 32.996113961383685]

```

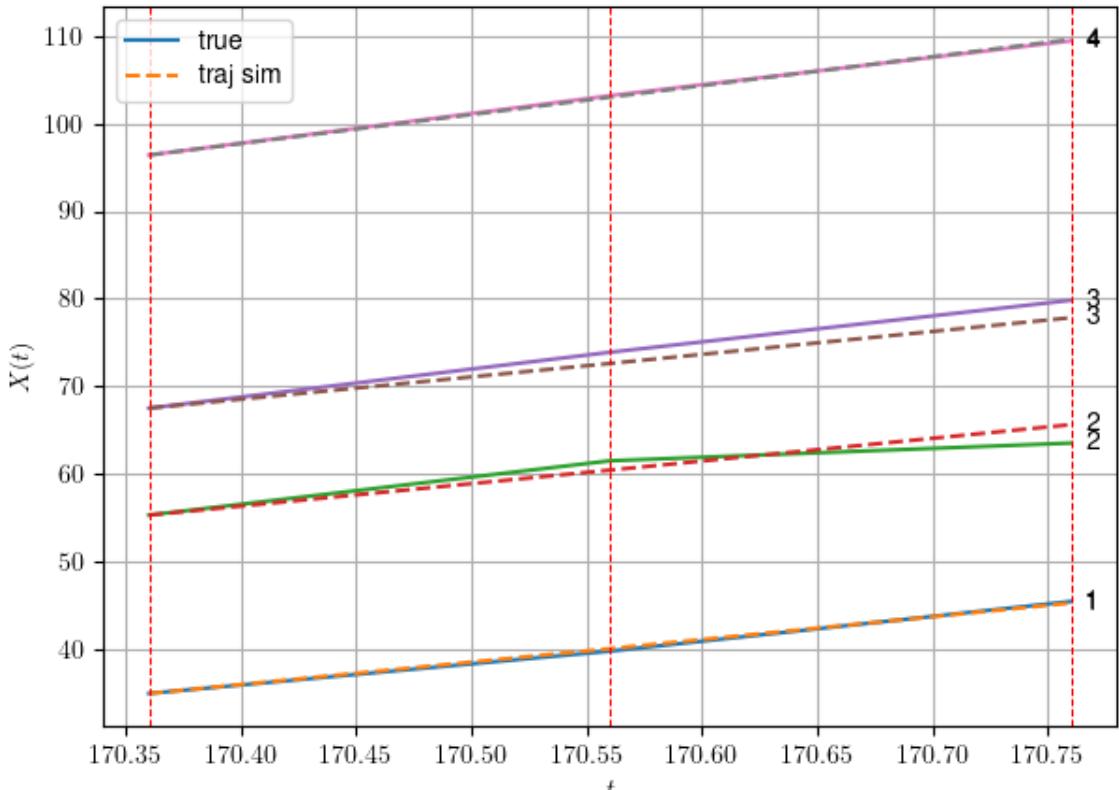
```

- Time interval n.1: [170.56, 170.76]
  * y_true: [28.33103197 10.10076519 29.63331411]
  * v_ann: [26.0006046295166, 25.91627311706543, 26.0
84476470947266, 32.996113961383685]
```

```

* err= 0.9410385098187999
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.000702942946471663
```

*df n. 3 – Scene n. 48, at it = 350*



For scene 48/55

```

* use LR_NN=5e-05 with err=1.795983309196488 at it=19
* v0_scn_mean = 32.65413543719226
* MAE = 0.9164604177200655
```

```

=====
=====
- Time interval n.0: [248.16, 248.36]
  * y_true: [31.21204442 24.6823336 32.34552948]
  * v_ann: [31.132736206054688, 33.52888107299805, 3
0.497007369995117, 30.24893521731518]
```

```

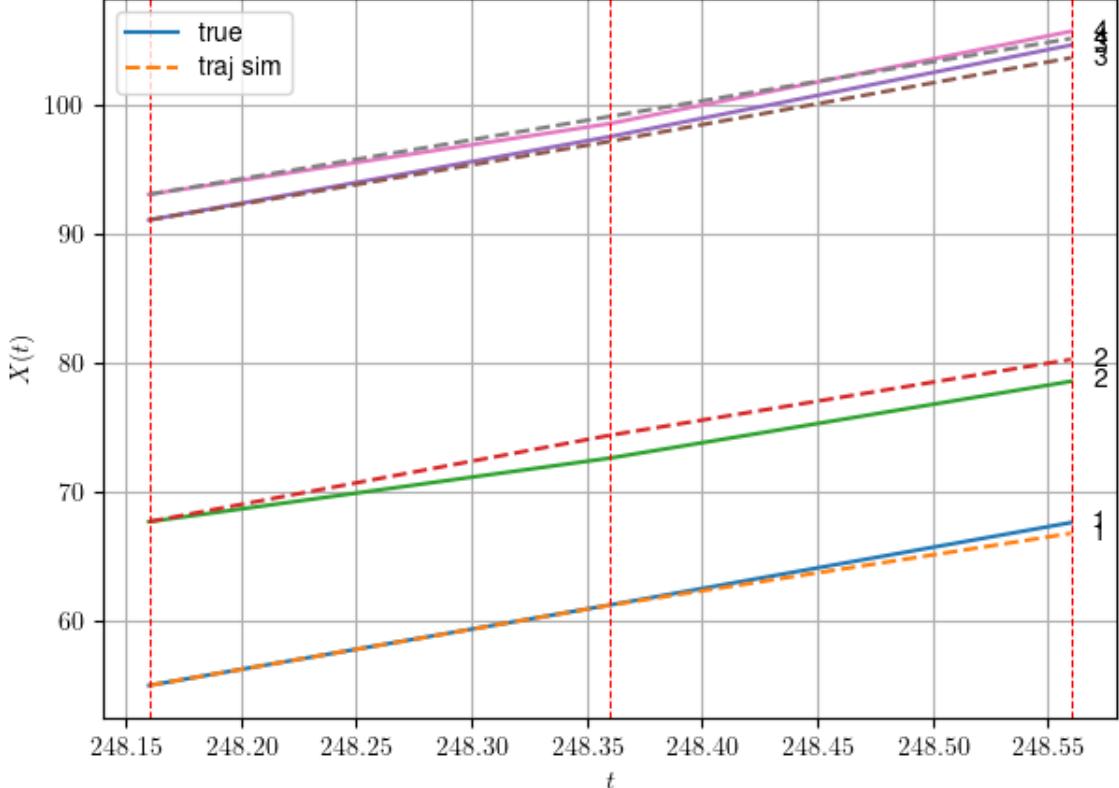
=====
=====
- Time interval n.1: [248.36, 248.56]
  * y_true: [31.9625999 29.77329807 35.48696999]
  * v_ann: [27.871265411376953, 29.416532516479492, 3
2.40571975708008, 30.24893521731518]
```

```

* err= 0.7028318046743258
* Learning rate NN = 0.0007289999630302191
* diff = 0.0006052562837259856

```

*df n. 3 – Scene n. 49, at it = 350*



For scene 49/55

```

* use LR_NN=0.001 with err=12.461373706131882 at it=19
* v0_scn_mean = 30.22052157907149
* MAE = 0.4773056309944237

```

```

- Time interval n.0: [320.56, 320.76]
  * y_true: [27.61038846 20.60122903 24.07186814]
  * v_ann: [35.43089294433594, 32.606712341308594, 3
  4.40009689331055, 28.13040675966605]

```

```

- Time interval n.1: [320.76, 320.96]
  * y_true: [30.26064275 26.25184013 33.56317876]
  * v_ann: [17.417205810546875, 22.254968643188477, 1
  6.971790313720703, 28.13040675966605]

```

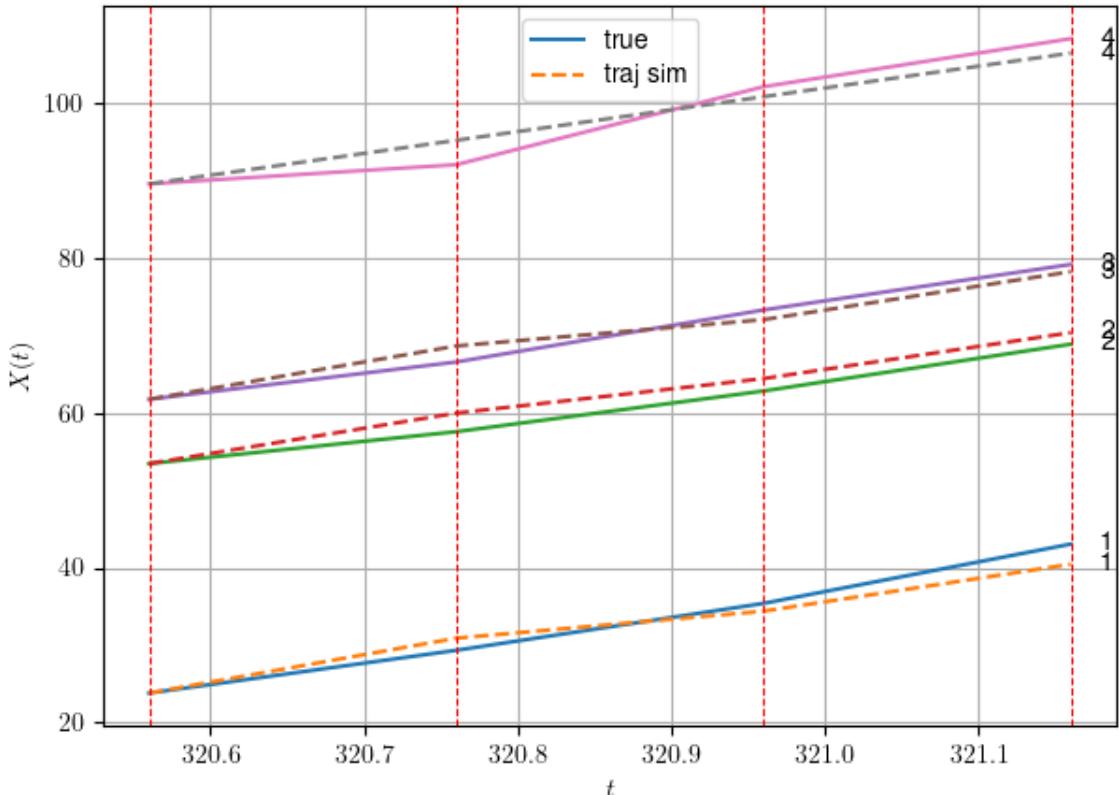
```

- Time interval n.2: [320.96, 321.16]
  * y_true: [38.25114958 30.20253063 29.36323845]
  * v_ann: [30.28278923034668, 29.637664794921875, 3
  0.957887649536133, 28.13040675966605]

```

```
* err= 2.655496413089077
* Learning rate NN = 0.0005904899444431067
* diff = 0.0011049251010852105
```

df n. 3 – Scene n. 50, at it = 350



For scene 50/55

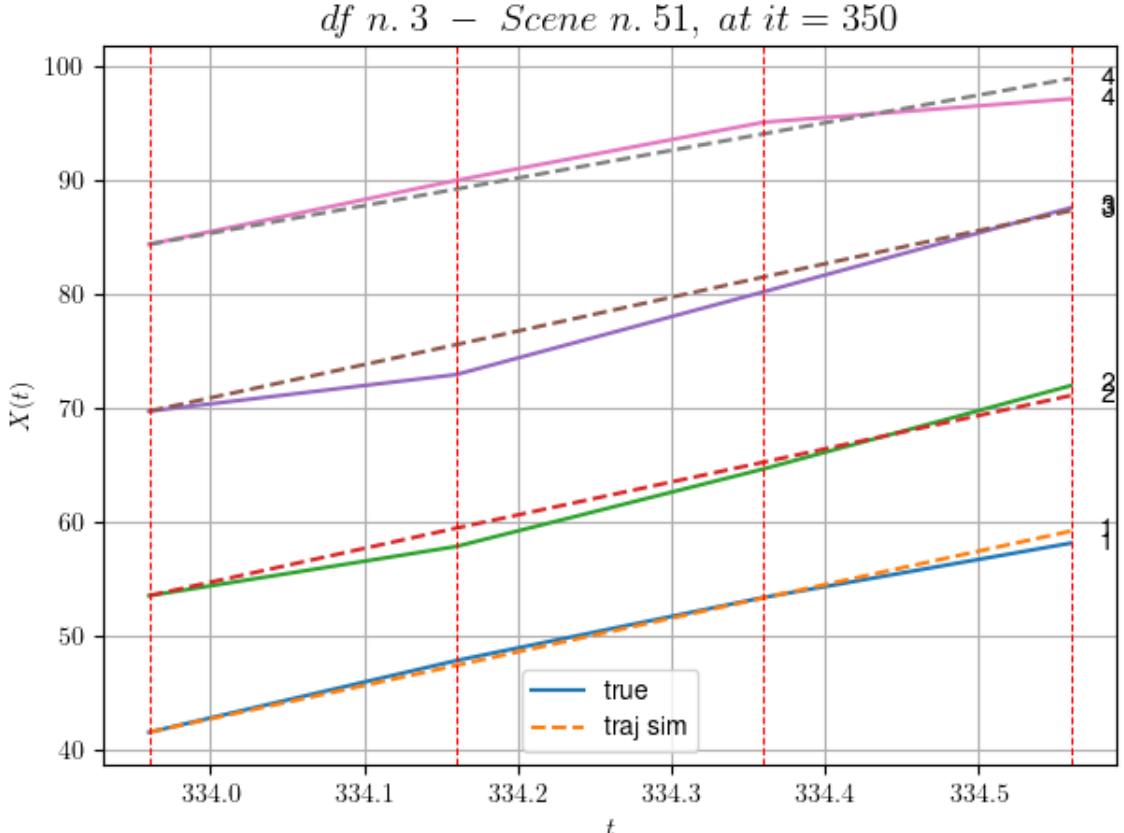
```
* use LR_NN=0.001 with err=7.371924622173847 at it=19
* v0_scn_mean = 28.343803427953326
* MAE = 1.5348163385689746
```

```
=====
=====
- Time interval n.0: [333.96, 334.16]
  * y_true: [31.40121985 21.58136302 16.05156144]
  * v_ann: [29.28033447265625, 29.626033782958984, 2
9.16485023498535, 24.219597199973922]
```

```
=====
=====
- Time interval n.1: [334.16, 334.36]
  * y_true: [27.67132891 33.9725354 36.25406589]
  * v_ann: [29.57513427734375, 28.886381149291992, 2
9.646425247192383, 24.219597199973922]
```

```
=====
=====
- Time interval n.2: [334.36, 334.56]
  * y_true: [23.81145278 36.52334008 36.85496039]
  * v_ann: [29.28738021850586, 29.202547073364258, 2
9.023704528808594, 24.219597199973922]
```

```
* err= 1.1499825705953024
* Learning rate NN = 2.952449540316593e-05
* diff = 0.00016400340812117165
```



For scene 51/55

```
* use LR_NN=5e-05 with err=4.3769725604373715 at it=19
* v0_scn_mean = 24.87937638202867
* MAE = 1.1476144119792355
```

---



---

- Time interval n.0: [393.36, 393.56]
  - \* y\_true: [28.21049617 36.91227562 35.66212709]
  - \* v\_ann: [25.87494468688965, 31.743144989013672, 30.302831649780273, 27.006719107886315]

---



---



---

- Time interval n.1: [393.56, 393.76]
  - \* y\_true: [27.89067116 17.24119841 30.82238865]
  - \* v\_ann: [27.457622528076172, 27.907052993774414, 31.787113189697266, 27.006719107886315]

---

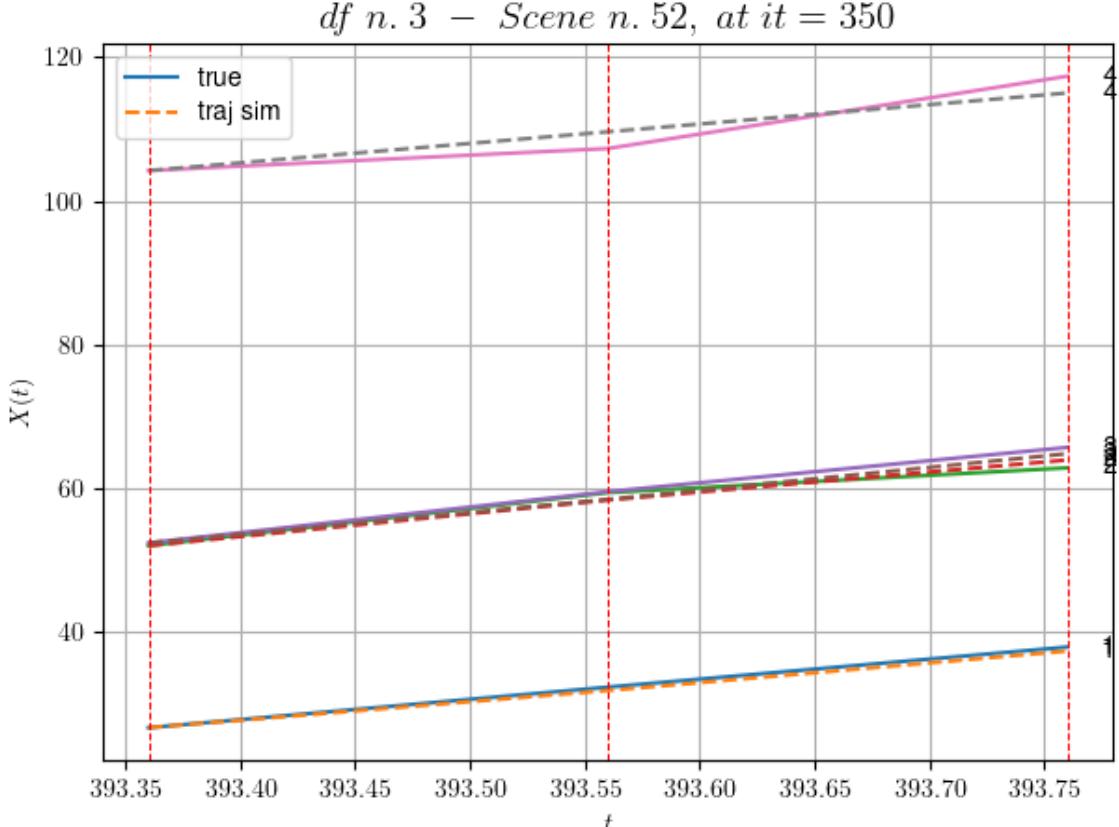


---



---

```
* err= 1.2988720934679348
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00016550371900359018
```



For scene 52/55

\* use LR\_NN=0.0001 with err=15.573675431235383 at it=19  
 \* v0\_scn\_mean = 27.348374263587164  
 \* MAE = 1.1633997865972339

---



---

- Time interval n.0: [521.76, 521.96]
  - \* y\_true: [10.54036018 15.07054541 11.30098461]
  - \* v\_ann: [14.287942886352539, 15.564104080200195, 1 5.33549690246582, 17.249600462639783]

---

- Time interval n.1: [521.96, 522.16]
  - \* y\_true: [20.11080333 12.92054275 19.50185752]
  - \* v\_ann: [18.126007080078125, 14.349664688110352, 1 4.562217712402344, 17.249600462639783]

---

- Time interval n.2: [522.16, 522.36]
  - \* y\_true: [16.31074126 16.85079656 12.50130097]
  - \* v\_ann: [13.160086631774902, 15.33564281463623, 1 5.113349914550781, 17.249600462639783]

---

- Time interval n.3: [522.36, 522.56]
  - \* y\_true: [11.43058292 15.20080004 9.15100954]
  - \* v\_ann: [13.45883560180664, 15.402698516845703, 1

5.057535171508789, 17.249600462639783]

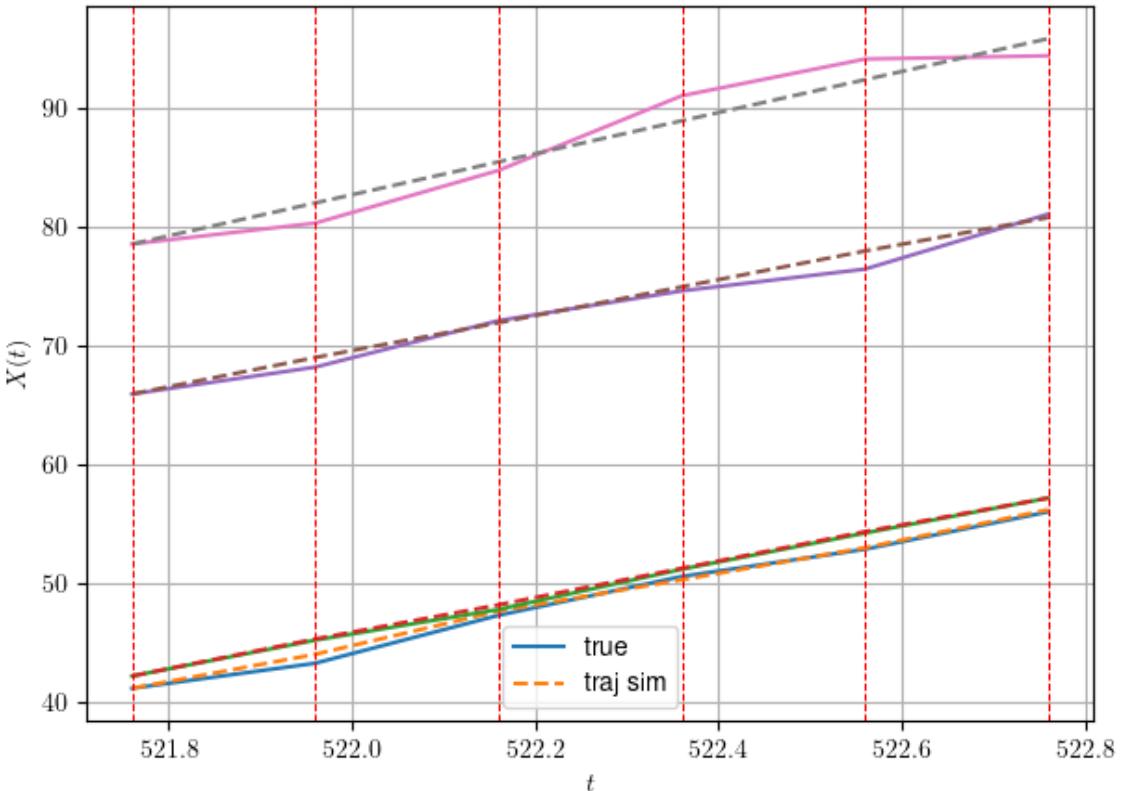
---

- Time interval n.4: [522.56, 522.76]
  - \* y\_true: [15.72089895 14.72089277 23.10276913]
  - \* v\_ann: [15.944677352905273, 14.115921020507812, 1  
4.036033630371094, 17.249600462639783]

---

- \* err= 0.7110366925372089
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 1.3233355415476211e-05

*df n. 3 – Scene n. 53, at it = 350*



For scene 53/55

- \* use LR\_NN=0.001 with err=25.72870225561614 at it=19
- \* v0\_scn\_mean = 18.704939903274074
- \* MAE = 0.7049277866115289

---



---

- Time interval n.0: [95.36, 95.56]
  - \* y\_true: [30.52238998 38.21809619 31.62683865 21.8  
1676128]
  - \* v\_ann: [25.134830474853516, 28.060617446899414, 2  
2.46654510498047, 28.429746627807617, 33.348609616246016]

---



---



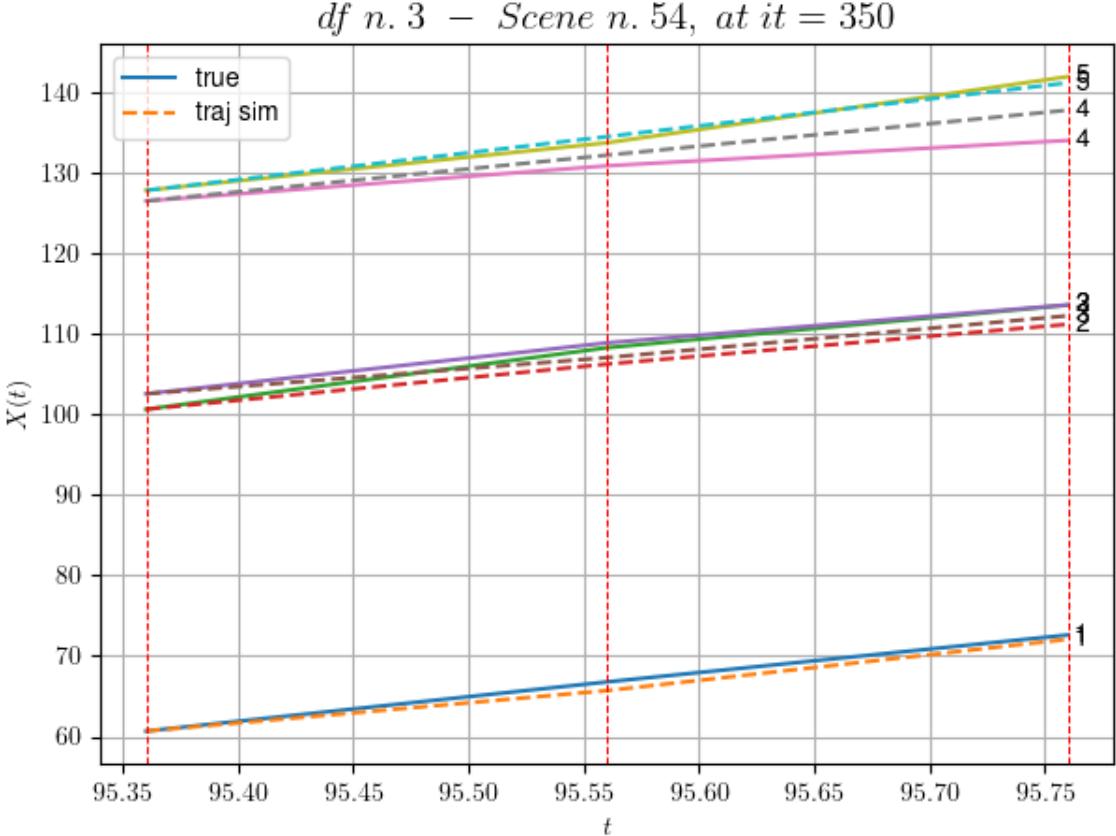
---

- Time interval n.1: [95.56, 95.76]
  - \* y\_true: [29.11270185 26.43618159 23.59563306 15.7  
3527867]

```
* v_ann: [31.854358673095703, 24.688426971435547, 2
5.963529586791992, 27.912839889526367, 33.348609616246016]
```

---

```
* err= 2.233313648444299
* Learning rate NN = 0.00036449998151510954
* diff = 0.0017378603395572512
```



For scene 54/55

```
* use LR_NN=0.0005 with err=17.474023968015626 at it=19
* v0_scn_mean = 32.87313348320182
* MAE = 2.2103647965464974
```

---



---

For df=3 with 55 scenes, time taken: 617.81

---



---



---



---



---



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---



---

In df n.4/10 we have 30 scenes

---



---



---



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---



---

- Time interval n.0: [7.04, 7.24]  
\* y\_true: [ 8.37556318 26.1843701 ]  
\* v\_ann: [17.764835357666016, 17.768030166625977, 3  
6.154185886666866 ]

---



---

```

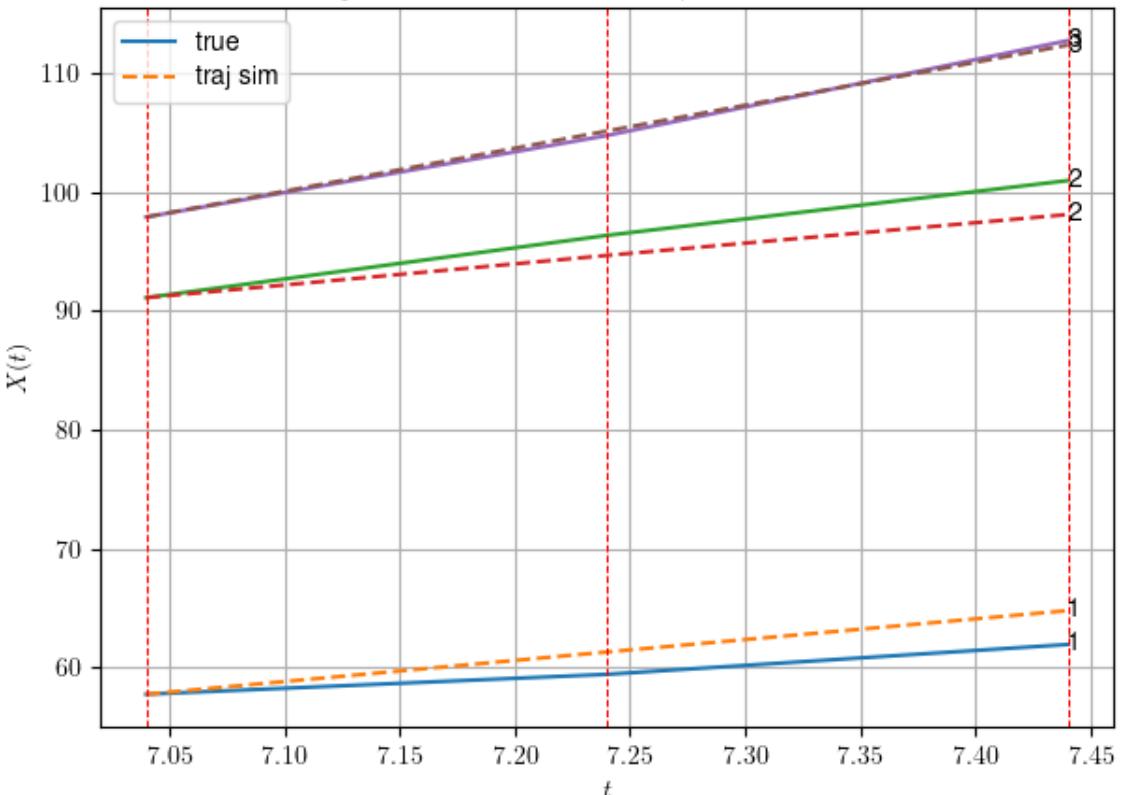
- Time interval n.1: [7.24, 7.44]
  * y_true: [12.54090657 23.03433042]
  * v_ann: [17.397260665893555, 17.180883407592773, 3
  6.154185886666866]
```

---

```

* err= 2.5452547322085692
* Learning rate NN = 0.00036449998151510954
* diff = 0.00010559727825798504
```

*df n. 4 – Scene n. 0, at it = 350*



For scene 0/30

```

* use LR_NN=0.0005 with err=12.219799272525151 at it=19
* v0_scn_mean = 35.62672885769243
* MAE = 2.5447323956821406
```

---



---

```

- Time interval n.0: [19.84, 20.04]
  * y_true: [38.50393497 35.76621737]
  * v_ann: [30.730234146118164, 28.972537994384766, 2
  6.058995147815413]
```

---



---

```

- Time interval n.1: [20.04, 20.24]
  * y_true: [14.10165462 33.63672046]
  * v_ann: [32.2280158996582, 29.41602325439453, 26.0
  58995147815413]
```

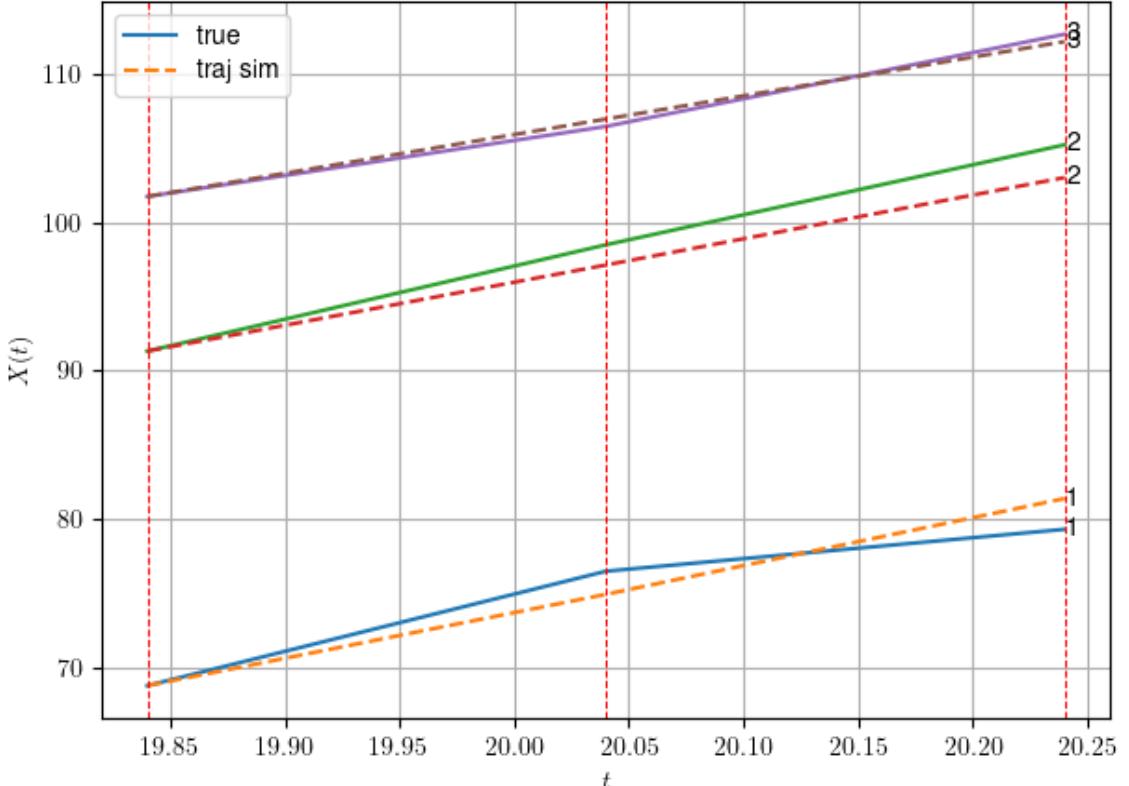
---



---

\* err= 1.5440912052929907  
 \* Learning rate NN = 7.289998757187277e-05  
 \* diff = 0.0038688353762610372

*df n. 4 – Scene n. 1, at it = 350*



For scene 1/30

\* use LR\_NN=0.0001 with err=10.442125254820956 at it=19  
 \* v0\_scn\_mean = 26.396766991043386  
 \* MAE = 1.5440912052929907

- 
- 
- Time interval n.0: [23.64, 23.84]
    - \* y\_true: [16.50112189 27.57447859]
    - \* v\_ann: [16.330955505371094, 21.93536949157715, 25.974604646459824]
  - Time interval n.1: [23.84, 24.04]
    - \* y\_true: [13.80103575 15.46275359]
    - \* v\_ann: [19.474374771118164, 14.650715827941895, 25.974604646459824]
  - Time interval n.2: [24.04, 24.24]
    - \* y\_true: [18.55153987 13.07248815]
    - \* v\_ann: [16.798187255859375, 16.853851318359375, 25.974604646459824]
- 
-

```

    - Time interval n.3: [24.24, 24.44]
      * y_true: [15.75144675 20.6942352 ]
      * v_ann: [16.029159545898438, 17.6544132232666, 25.
974604646459824]

```

---

```

    - Time interval n.4: [24.44, 24.64]
      * y_true: [ 8.80086699 23.00509018]
      * v_ann: [17.26628303527832, 15.490606307983398, 2
5.974604646459824]

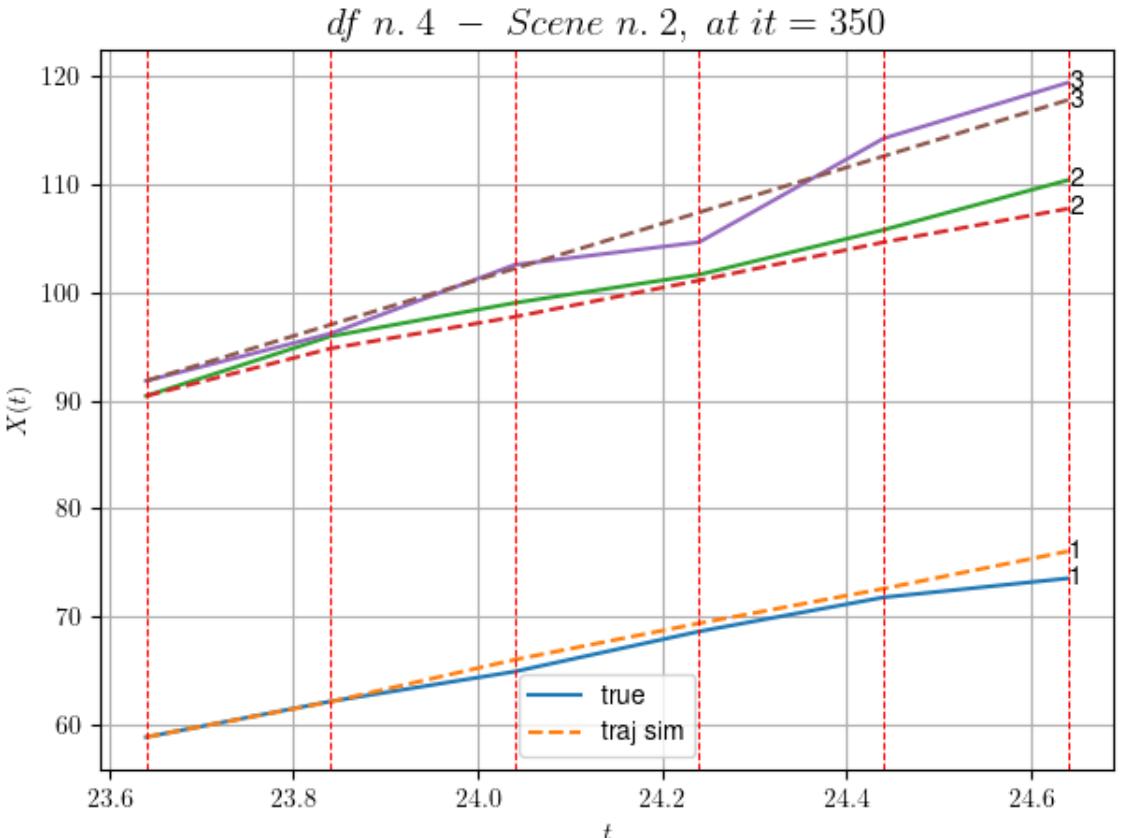
```

---

```

* err= 1.8821857091913081
* Learning rate NN = 0.0003874204121530056
* diff = A 000031251070077421106

```



For scene 2/30

```

* use LR_NN=0.001 with err=26.701927457490058 at it=19
* v0_scn_mean = 26.31960934939312
* MAE = 1.7851959303554612

```

---

```

    - Time interval n.0: [80.24, 80.44]
      * y_true: [20.8407888 28.56113721]
      * v_ann: [24.41345977783203, 28.79843521118164, 22.
367829423056083]

```

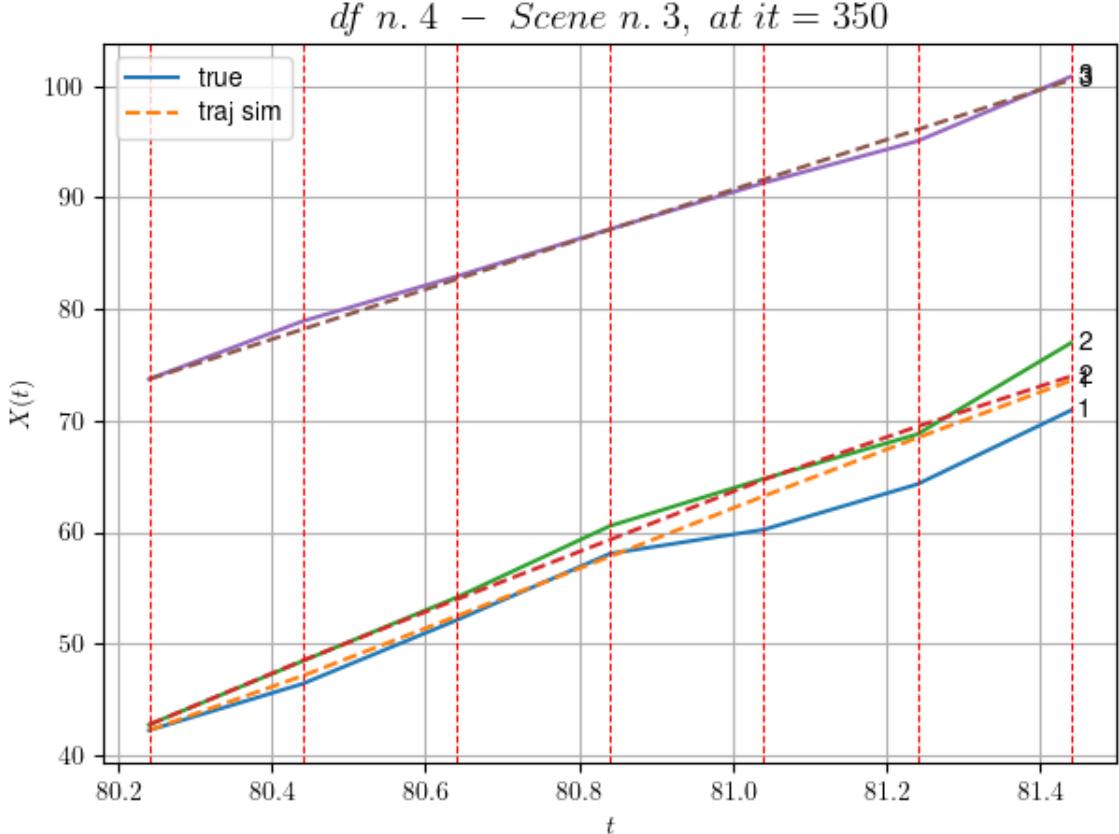
---

```

    - Time interval n.1: [80.44, 80.64]

```

```
* y_true: [28.49133895 28.481454 ]  
* v_ann: [26.68042755126953, 27.34910011291504, 22.  
367829423056083]  
-----  
-----  
- Time interval n.2: [80.64, 80.84]  
* y_true: [29.84173661 32.11200361]  
* v_ann: [26.81488609313965, 26.84339141845703, 22.  
367829423056083]  
-----  
-----  
- Time interval n.3: [80.84, 81.04]  
* y_true: [10.79069268 21.14157827]  
* v_ann: [27.069049835205078, 26.915678024291992, 2  
2.367829423056083]  
-----  
-----  
- Time interval n.4: [81.04, 81.24]  
* y_true: [20.33152897 19.96178137]  
* v_ann: [26.144819259643555, 23.80322265625, 22.36  
7829423056083]  
-----  
-----  
- Time interval n.5: [81.24, 81.44]  
* y_true: [33.14293198 40.94411969]  
* v_ann: [25.64080810546875, 22.570466995239258, 2  
2.367829423056083]  
-----  
-----  
* err= 2.2349727500163925  
* Learning rate NN = 0.00015690525469835848  
* diff = 0.0028282830760337774
```



For scene 3/30

\* use LR\_NN=0.0005 with err=54.9619518475183 at it=19  
 \* v0\_scn\_mean = 23.021960138519695  
 \* MAE = 2.2349727500163925

- Time interval n.0: [89.04, 89.24]  
 \* y\_true: [19.34082001 24.8230577 ]  
 \* v\_ann: [19.56194496154785, 20.487401962280273, 3  
 2.77541157779926]

- Time interval n.1: [89.24, 89.44]  
 \* y\_true: [14.120693 17.32233598]  
 \* v\_ann: [19.712993621826172, 20.634187698364258, 3  
 2.77541157779926]

- Time interval n.2: [89.44, 89.64]  
 \* y\_true: [18.19104002 31.50485669]  
 \* v\_ann: [19.08213233947754, 19.52654457092285, 32.  
 77541157779926]

- Time interval n.3: [89.64, 89.84]  
 \* y\_true: [22.07139916 11.31182118]  
 \* v\_ann: [19.689029693603516, 19.857065200805664, 3

2.77541157779926]

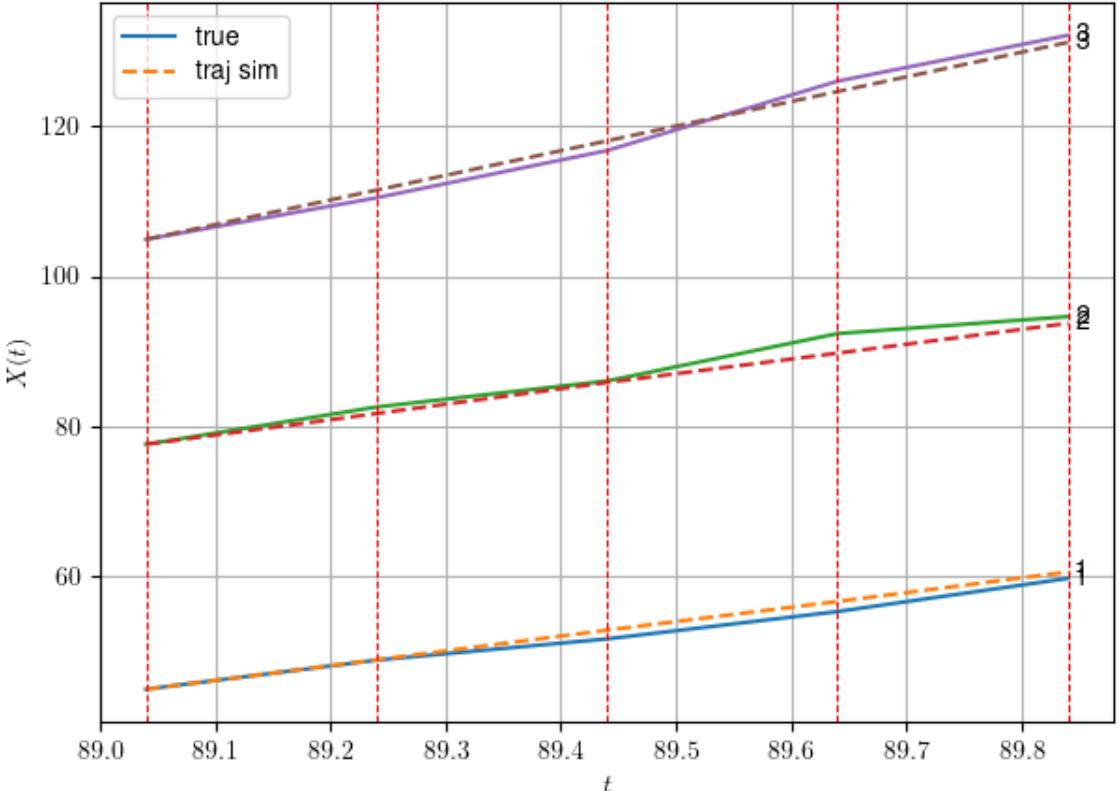
---



---

- \* err= 1.183246902559218
- \* Learning rate NN = 2.3914839403005317e-05
- \* diff = 0.0021427359786476696

*df n. 4 – Scene n. 4, at it = 350*



For scene 4/30

- \* use LR\_NN=5e-05 with err=4.267547375987428 at it=19
- \* v0\_scn\_mean = 32.537539278852506
- \* MAE = 1.183246902559218

---



---

- Time interval n.0: [96.44, 96.64]
  - \* y\_true: [16.86045215 20.08121647]
  - \* v\_ann: [18.354778289794922, 18.62966537475586, 1 8.4013644164237]

---



---

- Time interval n.1: [96.64, 96.84]
  - \* y\_true: [17.24055532 8.93061591]
  - \* v\_ann: [18.168676376342773, 18.662996292114258, 1 8.4013644164237]

---



---

- Time interval n.2: [96.84, 97.04]
  - \* y\_true: [21.11081641 16.18118624]
  - \* v\_ann: [17.085174560546875, 18.031387329101562, 1 8.4013644164237]

---



---

8.4013644164237]

- Time interval n.3: [97.04, 97.24]  
 \* y\_true: [26.9212791 14.46120094]  
 \* v\_ann: [17.947101593017578, 18.163249969482422, 1

8.4013644164237]

- Time interval n.4: [97.24, 97.44]  
 \* y\_true: [17.07093447 27.60253797]  
 \* v\_ann: [20.30845069885254, 18.73764419555664, 18.

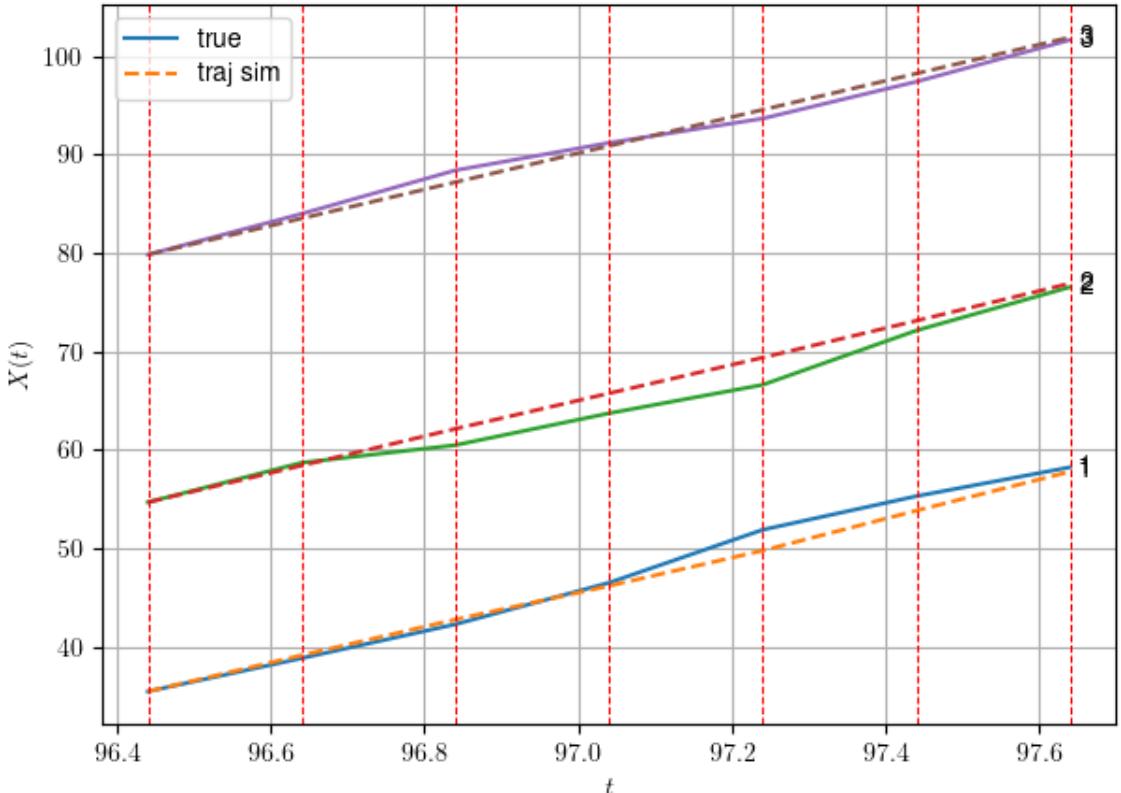
4013644164237]

- Time interval n.5: [97.44, 97.64]  
 \* y\_true: [14.70092006 22.05229805]  
 \* v\_ann: [19.83499526977539, 18.937780380249023, 1

8.4013644164237]

\* err= 1.251811874352599  
 \* Learning rate NN = 0.00015690525469835848  
 \* diff = 0 0000178103367022007

*df n. 4 – Scene n. 5, at it = 350*



For scene 5/30

\* use LR\_NN=0.0005 with err=31.772677156540297 at it=19  
 \* v0\_scn\_mean = 19.39544908947916  
 \* MAE = 1.251811874352599

```
=====
- Time interval n.0: [182.24, 182.44]
  * y_true: [18.61043577 13.125309  ]
  * v_ann: [19.0993709564209, 19.56864356994629, 20.7
73266238583332]

-----
- Time interval n.1: [182.44, 182.64]
  * y_true: [12.51734154 21.64870909]
  * v_ann: [15.621033668518066, 19.60881996154785, 2
0.773266238583332]

-----
- Time interval n.2: [182.64, 182.84]
  * y_true: [15.03048681 24.29091592]
  * v_ann: [19.059682846069336, 19.430910110473633, 2
0.773266238583332]

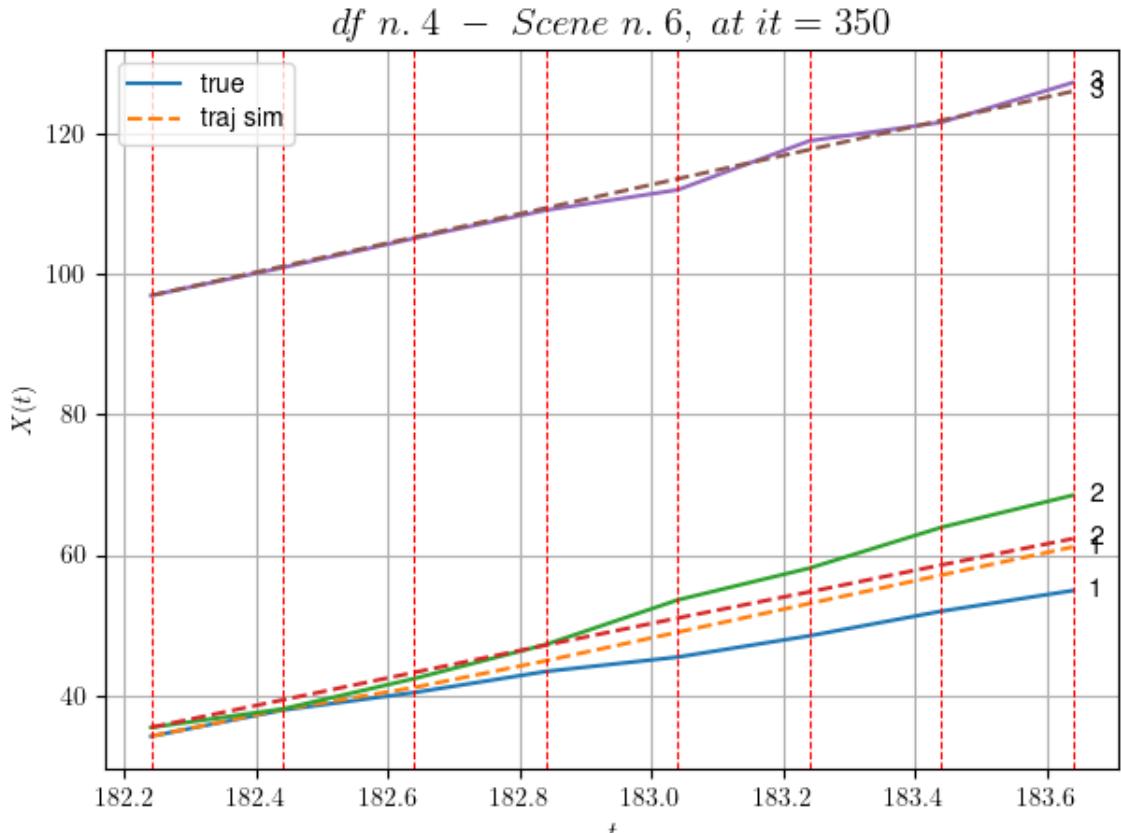
-----
- Time interval n.3: [182.84, 183.04]
  * y_true: [10.23036632 31.71160501]
  * v_ann: [20.31177520751953, 19.263851165771484, 2
0.773266238583332]

-----
- Time interval n.4: [183.04, 183.24]
  * y_true: [15.12061978 22.63128316]
  * v_ann: [20.42567253112793, 18.62567710876465, 20.
773266238583332]

-----
- Time interval n.5: [183.24, 183.44]
  * y_true: [17.50081627 28.99215837]
  * v_ann: [20.225101470947266, 19.144758224487305, 2
0.773266238583332]

-----
- Time interval n.6: [183.44, 183.64]
  * y_true: [14.74077551 22.90183379]
  * v_ann: [20.058124542236328, 18.750391006469727, 2
0.773266238583332]

-----
* err= 8.117309330174718
* Learning rate NN = 2.5418647055630572e-05
* diff = 0.003408719052298892
```



For scene 6/30

- \* use LR\_NN=0.0001 with err=53.63808019114244 at it=19
- \* v0\_scn\_mean = 21.56406223768993
- \* MAE = 8.098152210432506

---



---

- Time interval n.0: [193.04, 193.24]
- \* y\_true: [26.28155868 27.90372348]
- \* v\_ann: [24.01962661743164, 24.601242065429688, 1  
8.50661179835625]

---



---

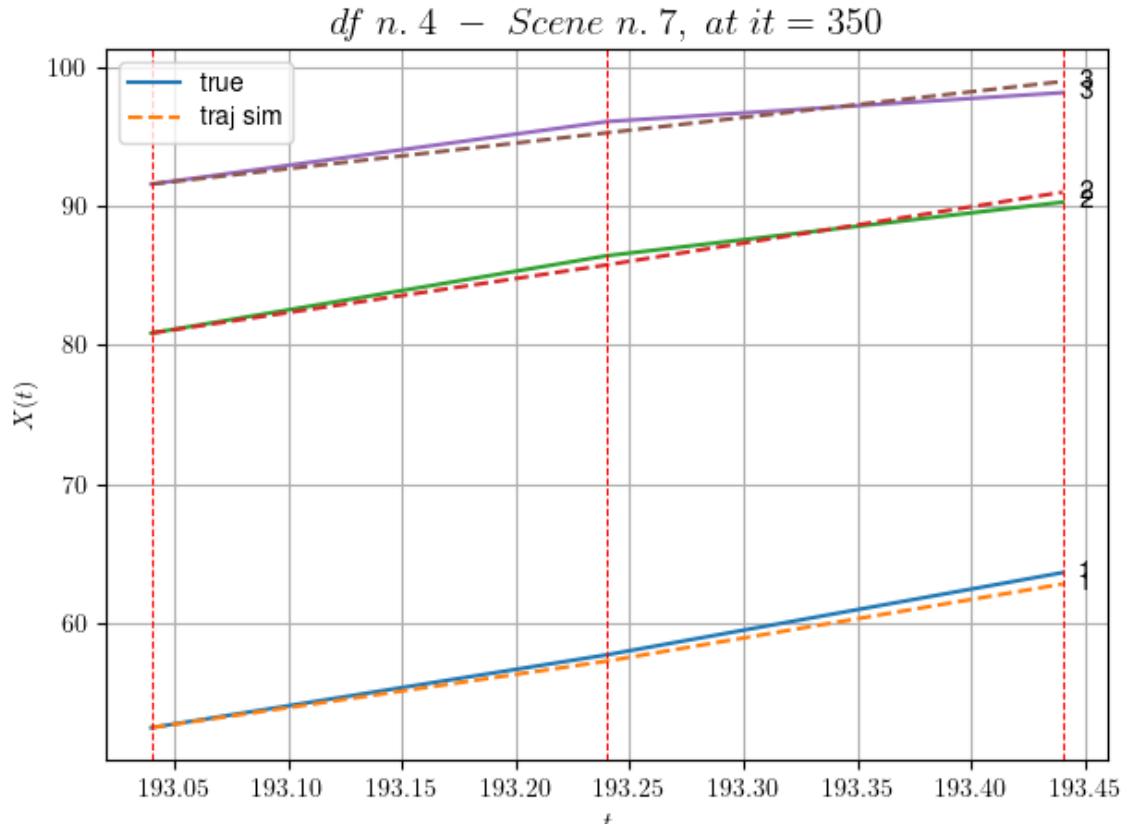
- Time interval n.1: [193.24, 193.44]
- \* y\_true: [29.63205884 19.30286837]
- \* v\_ann: [27.781158447265625, 26.20734214782715, 1  
8.50661179835625]

---



---

- \* err= 0.34894769157684813
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 3.946454357572904e-05



For scene 7/30

- \* use LR\_NN=0.0005 with err=7.209462792389737 at it=19
- \* v0\_scn\_mean = 19.491676030300177
- \* MAE = 0.33879899619699055

---



---

- Time interval n.0: [196.84, 197.04]
- \* y\_true: [ 8.77046468 10.16548364]
- \* v\_ann: [9.269118309020996, 5.247021022114495e-07,

20.188844124320998]

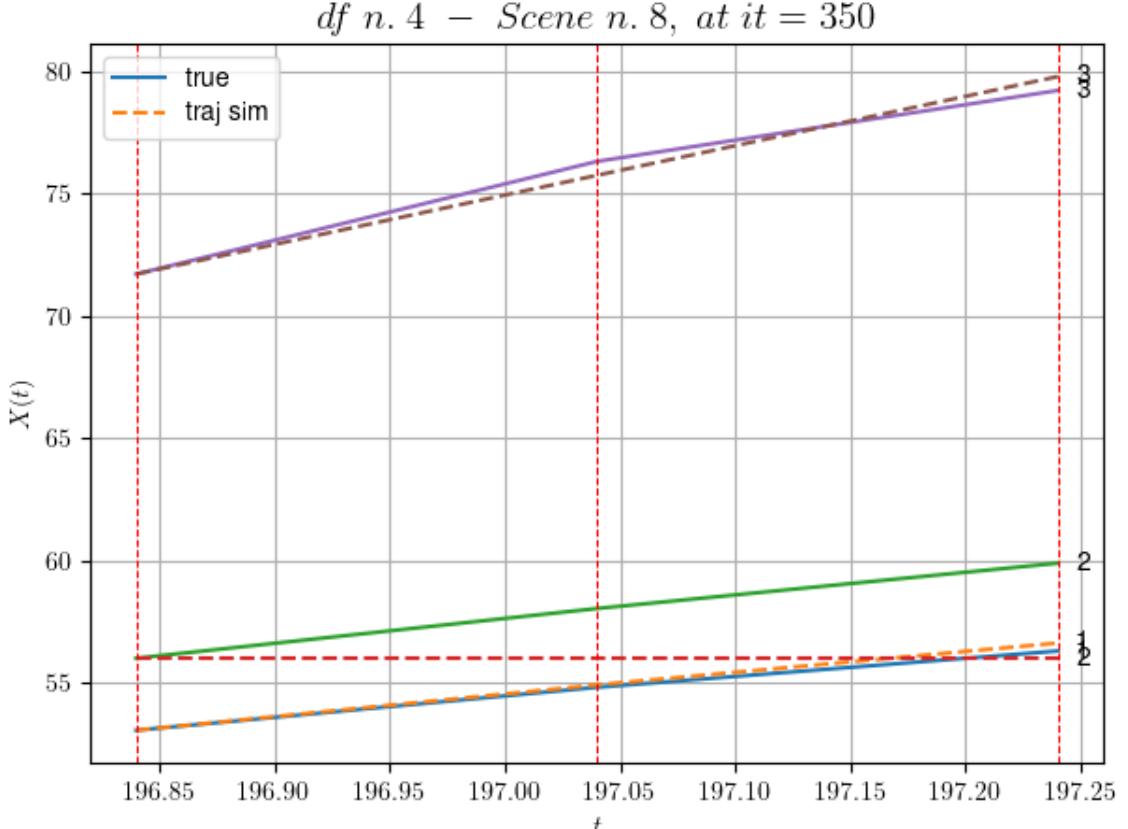
---

- Time interval n.1: [197.04, 197.24]
- \* y\_true: [7.43042623 9.26246532]
- \* v\_ann: [8.557124137878418, 1.0922868831642063e-08,

20.188844124320998]

---

- \* err= 2.221532223890162
- \* Learning rate NN = 0.0036449995823204517
- \* diff = 6.818143362785634e-06



For scene 8/30

- \* use LR\_NN=0.005 with err=3.007464147055894 at it=19
- \* v0\_scn\_mean = 21.029729210389302
- \* MAE = 2.221379268691242

---



---

For scene 9/30

- \* use LR\_NN=0.0005 with err=5.398193139827072 at it=19
- \* v0\_scn\_mean = 30.094441532938035
- \* MAE = 30.51618083006098

---



---

- Time interval n.0: [224.84, 225.04]
  - \* y\_true: [17.10046829 25.29311811]
  - \* v\_ann: [18.736194610595703, 20.32260513305664, 1 5.713780360625538]

---



---

- Time interval n.1: [225.04, 225.24]
  - \* y\_true: [17.70062553 10.9614656 ]
  - \* v\_ann: [19.13191795349121, 20.641841888427734, 1 5.713780360625538]

---



---

- Time interval n.2: [225.24, 225.44]

```
* y_true: [22.57087879 26.33405568]
* v_ann: [18.311176300048828, 20.41908073425293, 1
5.713780360625538]

-----
- Time interval n.3: [225.44, 225.64]
* y_true: [16.35079439 22.81365517]
* v_ann: [19.17206382751465, 20.751367568969727, 1
5.713780360625538]

-----
- Time interval n.4: [225.64, 225.84]
* y_true: [20.8811317 16.55300892]
* v_ann: [19.253681182861328, 20.72853660583496, 1
5.713780360625538]

-----
- Time interval n.5: [225.84, 226.04]
* y_true: [16.52103304 29.98602504]
* v_ann: [19.0937557220459, 20.86031723022461, 15.7
13780360625538]

-----
- Time interval n.6: [226.04, 226.24]
* y_true: [18.95135857 18.46388585]
* v_ann: [19.829614639282227, 15.456851959228516, 1
5.713780360625538]

-----
- Time interval n.7: [226.24, 226.44]
* y_true: [20.26160248 17.75418412]
* v_ann: [19.72559928894043, 21.31635093688965, 15.
713780360625538]

-----
- Time interval n.8: [226.44, 226.64]
* y_true: [16.68150299 14.60353303]
* v_ann: [19.554912567138672, 16.507503509521484, 1
5.713780360625538]

-----
- Time interval n.9: [226.64, 226.84]
* y_true: [22.62228992 25.47686963]
* v_ann: [19.036983489990234, 21.346296310424805, 1
5.713780360625538]

-----
- Time interval n.10: [226.84, 227.04]
* y_true: [22.04244959 23.58655245]
* v_ann: [19.716981887817383, 21.505706787109375, 1
5.713780360625538]
```

```

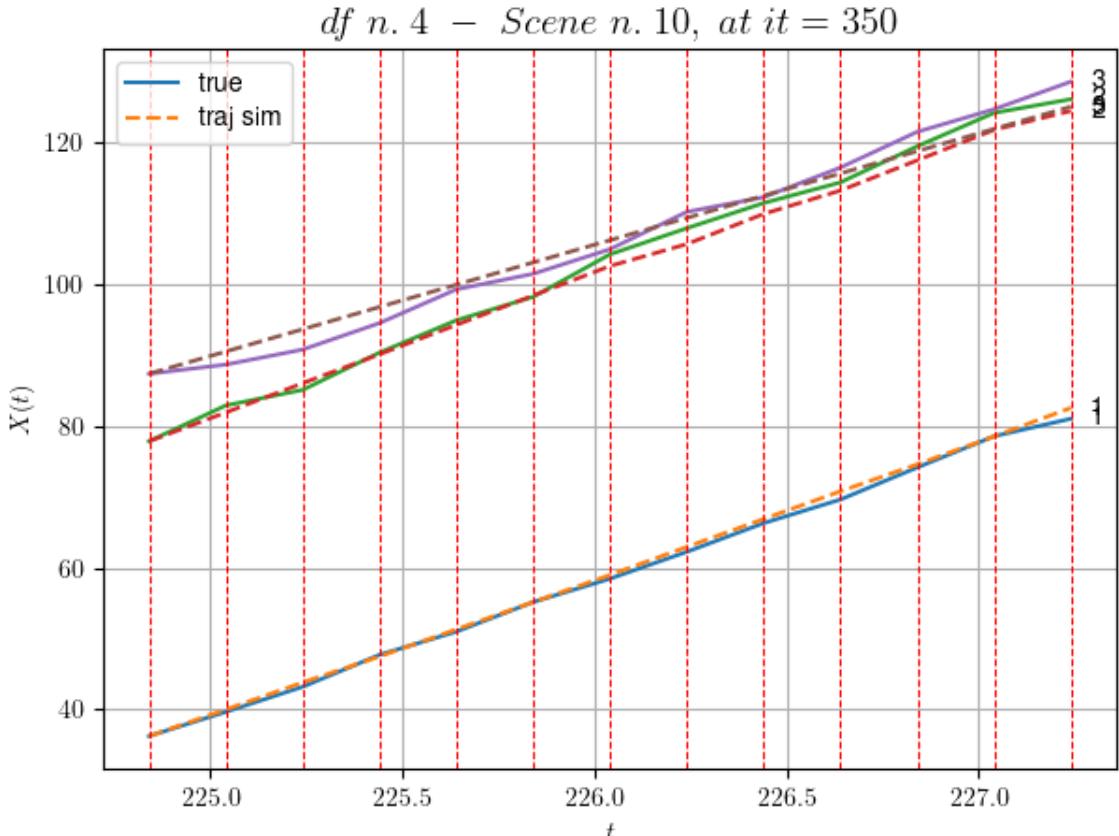
- Time interval n.11: [227.04, 227.24]
  * y_true: [12.37151499 9.65291202]
  * v_ann: [20.15968132019043, 13.352619171142578, 1
5.713780360625538]

```

```

* err= 2.112026109643386
* Learning rate NN = 4.431466732057743e-05
* diff= 0.000122606766221775

```



For scene 10/30

```

* use LR_NN=0.0005 with err=200.65264021589715 at it=19
* v0_scn_mean = 16.938209896071623
* MAE = 1.9492043035195799

```

```

=====
=====
- Time interval n.0: [230.84, 231.04]
  * y_true: [ 5.64695095 17.97864337]
  * v_ann: [11.727468490600586, 13.951117515563965, 2
3.322771251469238]

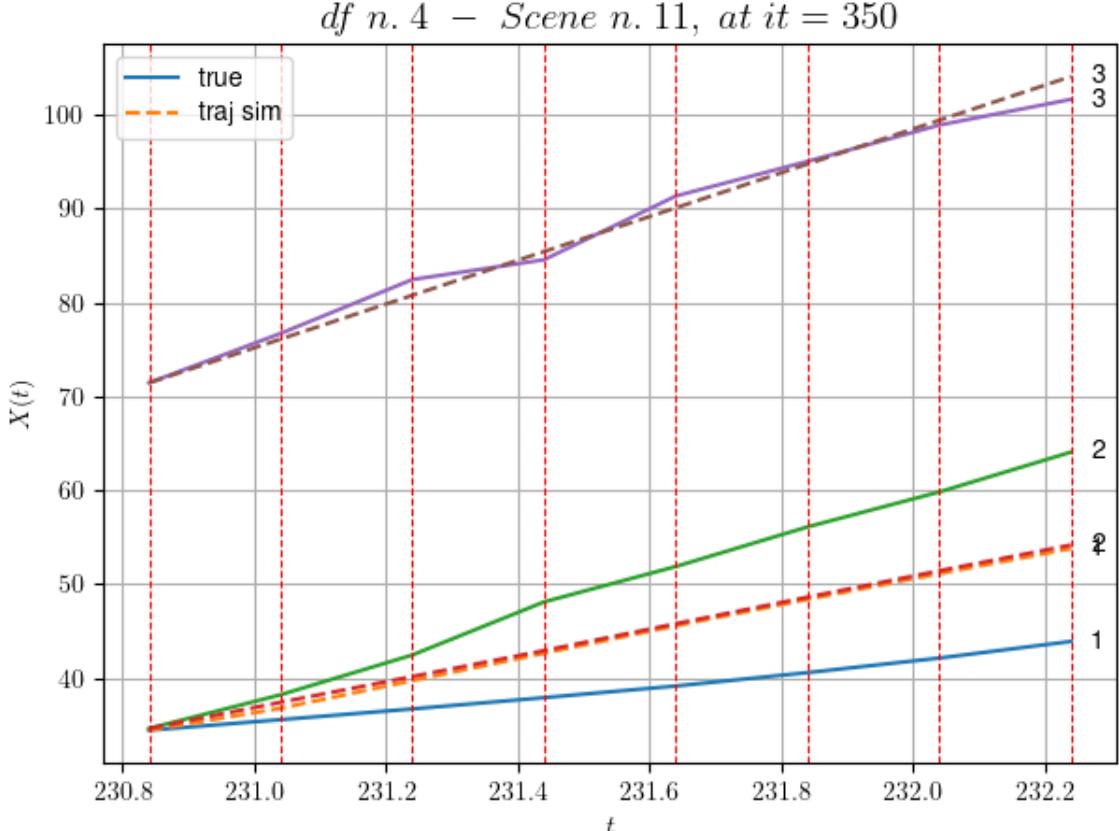
```

```

=====
=====
- Time interval n.1: [231.04, 231.24]
  * y_true: [ 5.72513489 21.19066695]
  * v_ann: [14.742033004760742, 13.709158897399902, 2
3.322771251469238]

```

```
-----  
    - Time interval n.2: [231.24, 231.44]  
      * y_true: [ 6.01015392 28.29114422]  
      * v_ann: [14.570145606994629, 13.83653736114502, 2  
3.322771251469238]  
  
-----  
    - Time interval n.3: [231.44, 231.64]  
      * y_true: [ 6.20016661 18.85086271]  
      * v_ann: [14.686807632446289, 14.30115032196045, 2  
3.322771251469238]  
  
-----  
    - Time interval n.4: [231.64, 231.84]  
      * y_true: [ 7.13021091 21.11121983]  
      * v_ann: [14.024612426757812, 14.1566743850708, 23.  
322771251469238]  
  
-----  
    - Time interval n.5: [231.84, 232.04]  
      * y_true: [ 7.75024044 18.61116554]  
      * v_ann: [13.753570556640625, 14.052531242370605, 2  
3.322771251469238]  
  
-----  
    - Time interval n.6: [232.04, 232.24]  
      * y_true: [ 8.87530762 21.24160102]  
      * v_ann: [13.318620681762695, 13.75472354888916, 2  
3.322771251469238]  
  
-----  
    * err= 25.883701653684643  
    * Learning rate NN = 0.00025418648147024214  
    * diff = 0.0010474058895901805
```



For scene 11/30

\* use LR\_NN=0.001 with err=20.53961805705759 at it=19  
 \* v0\_scn\_mean = 23.895056733633915  
 \* MAE = 25.6699277375528

---



---

- Time interval n.0: [233.84, 234.04]  
 \* y\_true: [14.14101026 12.7012637 ]  
 \* v\_ann: [21.08547592163086, 21.919212341308594, 2  
 1.4628681603156]

---

- Time interval n.1: [234.04, 234.24]  
 \* y\_true: [26.43219185 20.11227439]  
 \* v\_ann: [20.919097900390625, 21.743677139282227, 2  
 1.4628681603156]

---

- Time interval n.2: [234.24, 234.44]  
 \* y\_true: [22.40209801 33.22429882]  
 \* v\_ann: [20.893413543701172, 21.806812286376953, 2  
 1.4628681603156]

---

- Time interval n.3: [234.44, 234.64]  
 \* y\_true: [ 7.15071478 24.83361026]  
 \* v\_ann: [21.11781120300293, 21.981285095214844, 2

1.4628681603156]

- Time interval n.4: [234.64, 234.84]  
 \* y\_true: [26.44301464 23.06377261]  
 \* v\_ann: [21.174100875854492, 21.704551696777344, 2

1.4628681603156]

- Time interval n.5: [234.84, 235.04]  
 \* y\_true: [27.303494 31.34578132]  
 \* v\_ann: [21.219839096069336, 21.724164962768555, 2

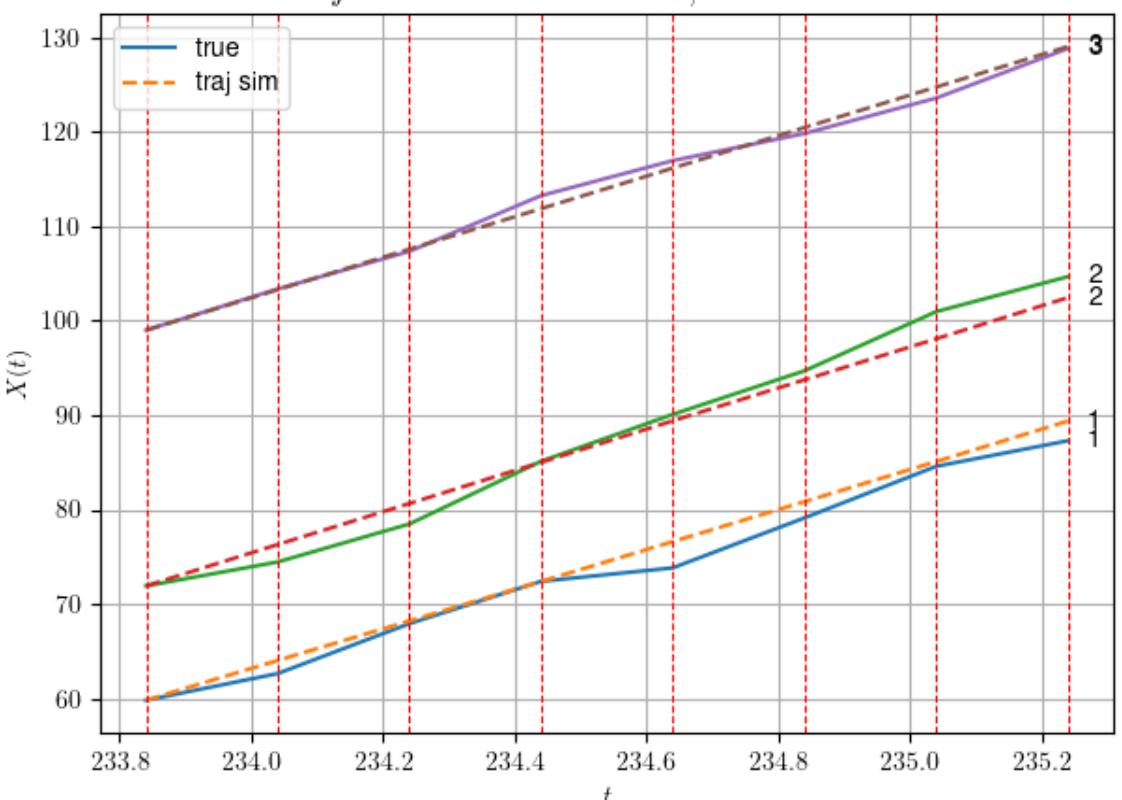
1.4628681603156]

- Time interval n.6: [235.04, 235.24]  
 \* y\_true: [13.58189317 18.51369375]  
 \* v\_ann: [21.44842529296875, 21.82640838623047, 21.

4628681603156]

\* err= 1.849558523495391  
 \* Learning rate NN = 1.2709323527815286e-05  
 \* diff = 0.005353289059959465

*df n. 4 – Scene n. 12, at it = 350*



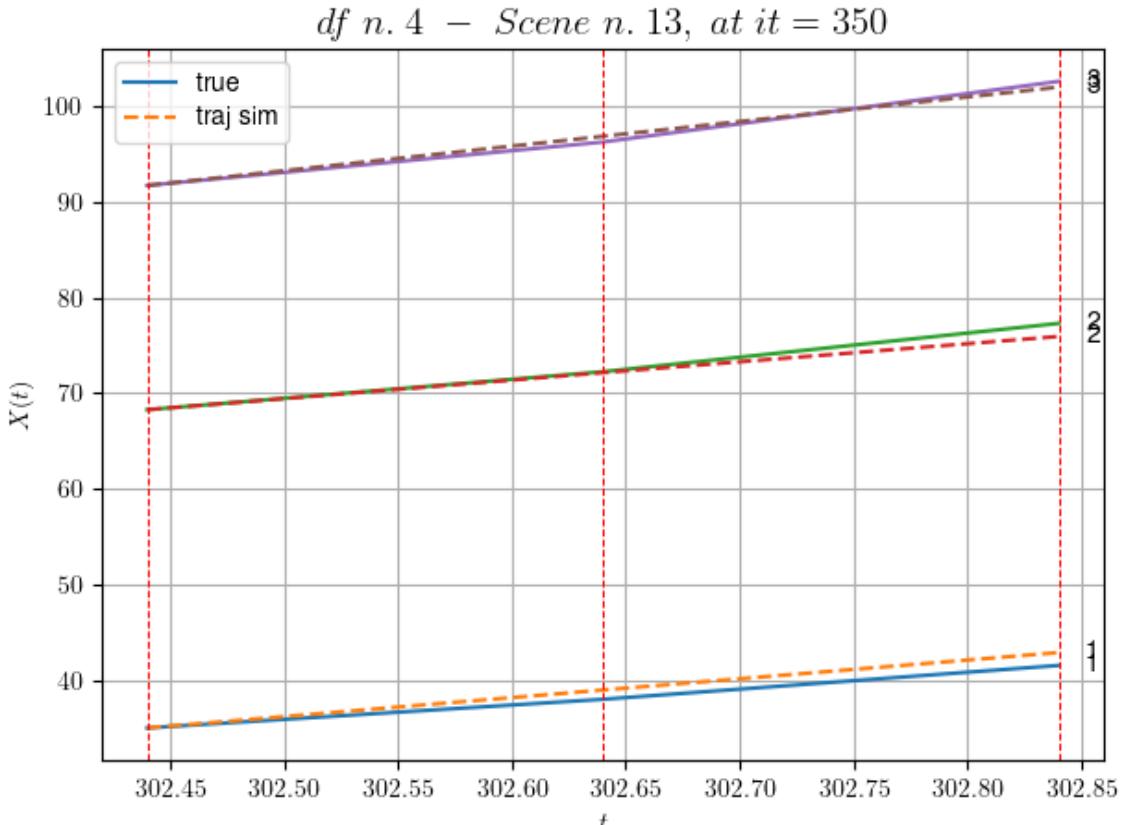
For scene 12/30

\* use LR\_NN=5e-05 with err=33.16115480672783 at it=19  
 \* v0\_scn\_mean = 22.194560422955682  
 \* MAE = 1.5724694277090026

```
=====
=====
- Time interval n.0: [302.44, 302.64]
  * y_true: [15.00036276 19.90190261]
  * v_ann: [19.862836837768555, 19.399948120117188, 2
5.744568982281994]
```

```
=====
- Time interval n.1: [302.64, 302.84]
  * y_true: [17.72492583 25.30273749]
  * v_ann: [19.60759925842285, 18.958084106445312, 2
5.744568982281994]
```

```
=====
* err= 0.5973240629366087
* Learning rate NN = 7.289998757187277e-05
* diff = 0.00015578750754131255
```



For scene 13/30

```
* use LR_NN=0.0001 with err=2.0994436011925086 at it=19
* v0 scn mean = 26.10928936007706
* MAE = 0.5874096780038975
```

```
=====
=====
- Time interval n.0: [364.64, 364.84]
  * y_true: [23.68175628 20.26218764]
  * v_ann: [18.459890365600586, 19.10619354248047, 2
8.205737859029586]
```

```

-----  

-----  

    - Time interval n.1: [364.84, 365.04]  

      * y_true: [20.38169455 13.81168669]  

      * v_ann: [18.78018569946289, 19.18883514404297, 28.  

205737859029586]  

-----  

-----  

    - Time interval n.2: [365.04, 365.24]  

      * y_true: [10.17092159 27.1635357 ]  

      * v_ann: [18.961278915405273, 18.259185791015625, 2  

8.205737859029586]  

-----  

-----  

    - Time interval n.3: [365.24, 365.44]  

      * y_true: [18.57186597 15.36227914]  

      * v_ann: [18.242225646972656, 18.175430297851562, 2  

8.205737859029586]  

-----  

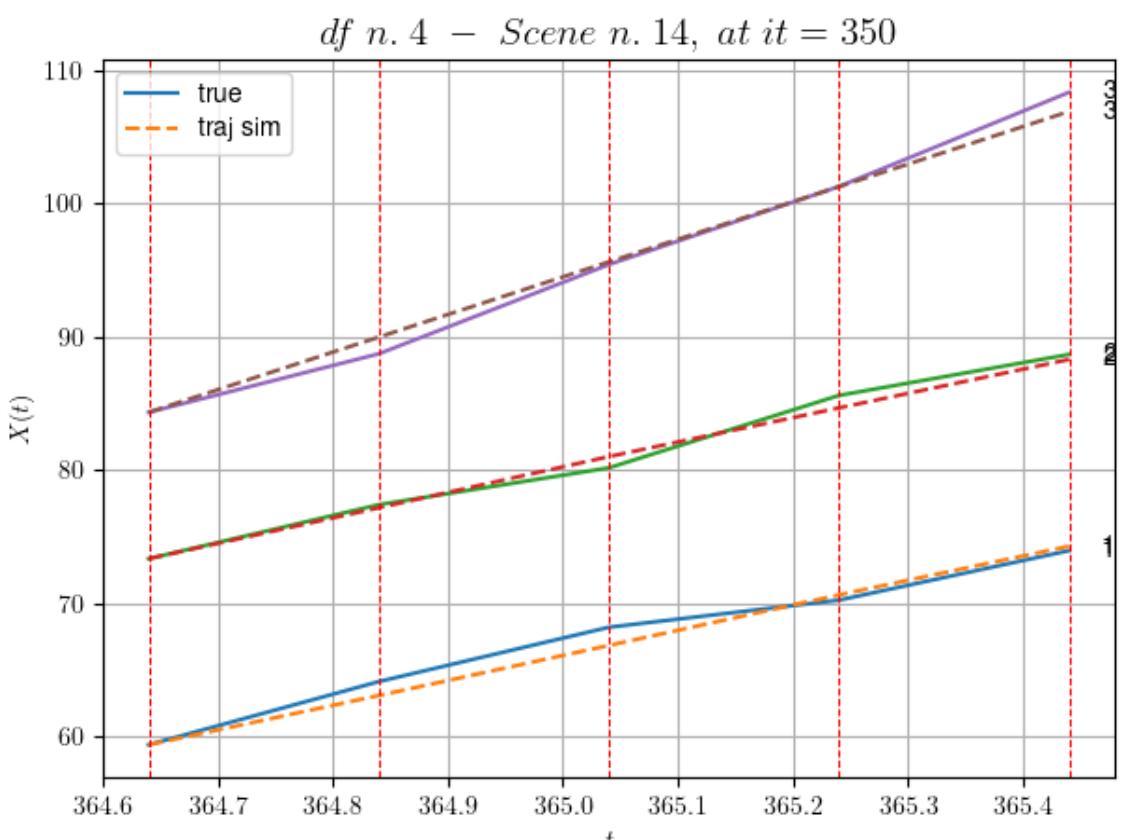
-----  

      * err= 0.5786915699012742  

      * Learning rate NN = 4.7829678806010634e-05  

      * diff = 3.718269809982466e-05

```



For scene 14/30

```

* use LR_NN=0.0001 with err=0.9748428651229529 at it=19
* v0_scn_mean = 28.35951874824957
* MAE = 0.542893633040443
=====
```

```
=====
- Time interval n.0: [422.64, 422.84]
  * y_true: [18.36052369 19.91162557]
  * v_ann: [31.83439826965332, 24.057586669921875, 2
7.545107346547073]

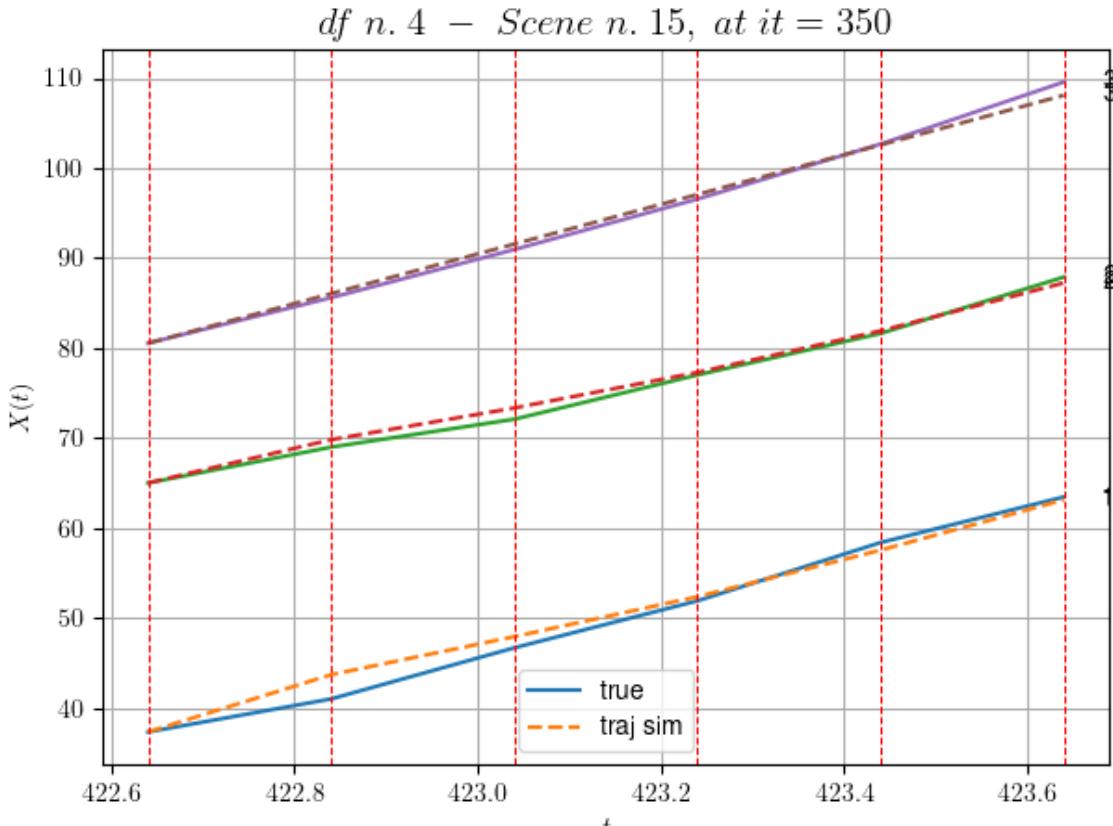
-----
- Time interval n.1: [422.84, 423.04]
  * y_true: [28.40107569 15.51150308]
  * v_ann: [21.12281036376953, 17.597827911376953, 2
7.545107346547073]

-----
- Time interval n.2: [423.04, 423.24]
  * y_true: [26.09121176 24.58263804]
  * v_ann: [22.194475173950195, 19.76385498046875, 2
7.545107346547073]

-----
- Time interval n.3: [423.24, 423.44]
  * y_true: [32.41191994 23.07275882]
  * v_ann: [25.880836486816406, 23.11419677734375, 2
7.545107346547073]

-----
- Time interval n.4: [423.44, 423.64]
  * y_true: [25.31178577 31.31439465]
  * v_ann: [27.936601638793945, 26.61764907836914, 2
7.545107346547073]

-----
* err= 0.8716497532442492
* Learning rate NN = 0.0003874204121530056
* diff = 0.0009644346157813288
```



For scene 15/30

\* use LR\_NN=0.001 with err=2.507709220908367 at it=19

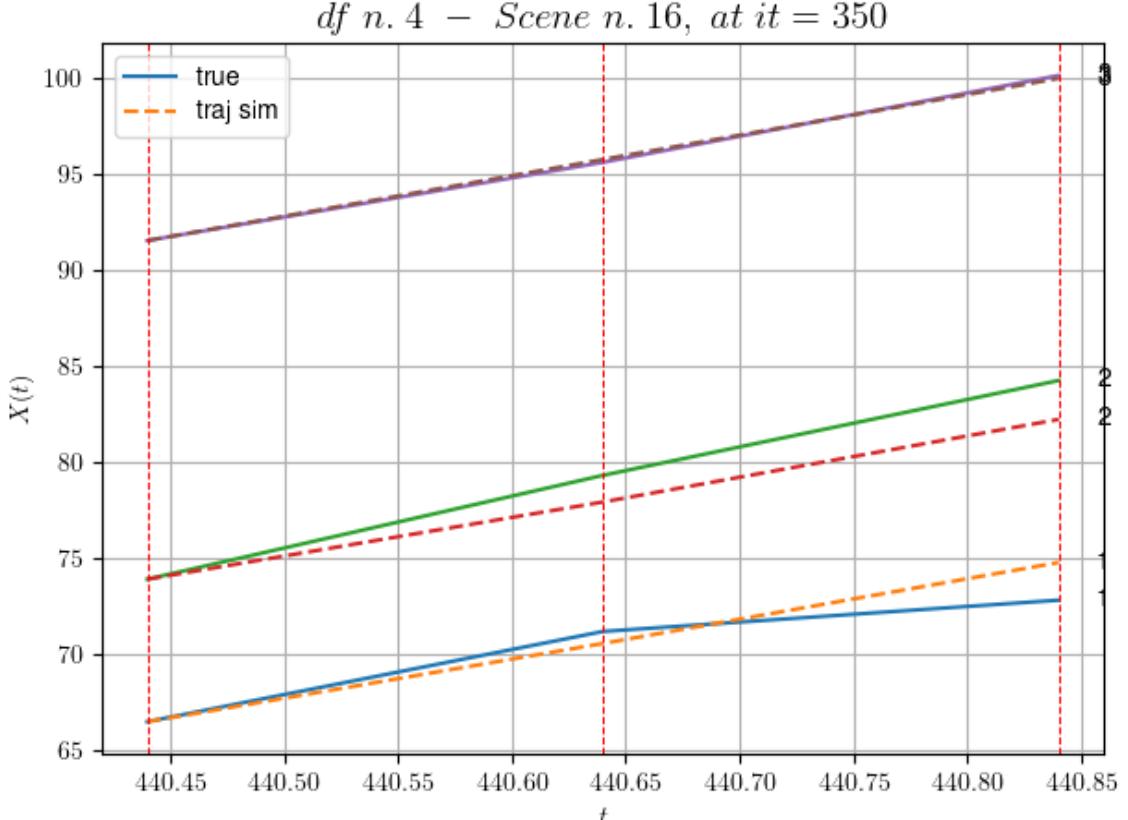
\* v0\_scn\_mean = 27.755508918629225

\* MAE = 0.8048991975329608

- Time interval n.0: [440.44, 440.64]  
 \* y\_true: [23.50209477 27.05306951]  
 \* v\_ann: [20.373493194580078, 20.118600845336914, 2  
 1.12705861242051]

- Time interval n.1: [440.64, 440.84]  
 \* y\_true: [ 8.15079495 24.70319187]  
 \* v\_ann: [21.09634017944336, 21.51072883605957, 21.  
 12705861242051]

\* err= 1.1463899340849417  
 \* Learning rate NN = 0.00036449998151510954  
 \* diff = 0.00017539439862246375



For scene 16/30

- \* use LR\_NN=0.0005 with err=2.744738335972809 at it=19
- \* v0\_scn\_mean = 21.887532115942648
- \* MAE = 1.145274860769602

---



---

- Time interval n.0: [459.64, 459.84]
- \* y\_true: [ 8.02057991 18.30147717]
- \* v\_ann: [16.09236717224121, 19.006315231323242, 2  
1.749537222117457]

---

- Time interval n.1: [459.84, 460.04]
- \* y\_true: [15.90126261 32.50305135]
- \* v\_ann: [21.569232940673828, 18.37797737121582, 2  
1.749537222117457]

---

- Time interval n.2: [460.04, 460.24]
- \* y\_true: [12.56106954 7.60079575]
- \* v\_ann: [16.907470703125, 17.166126251220703, 21.7  
49537222117457]

---

- Time interval n.3: [460.24, 460.44]
- \* y\_true: [22.47215871 13.7515264 ]
- \* v\_ann: [15.822851181030273, 17.98103141784668, 2

1.749537222117457]

---

- Time interval n.4: [460.44, 460.64]
  - \* y\_true: [12.66130245 40.10510628]
  - \* v\_ann: [20.351999282836914, 22.454660415649414, 2

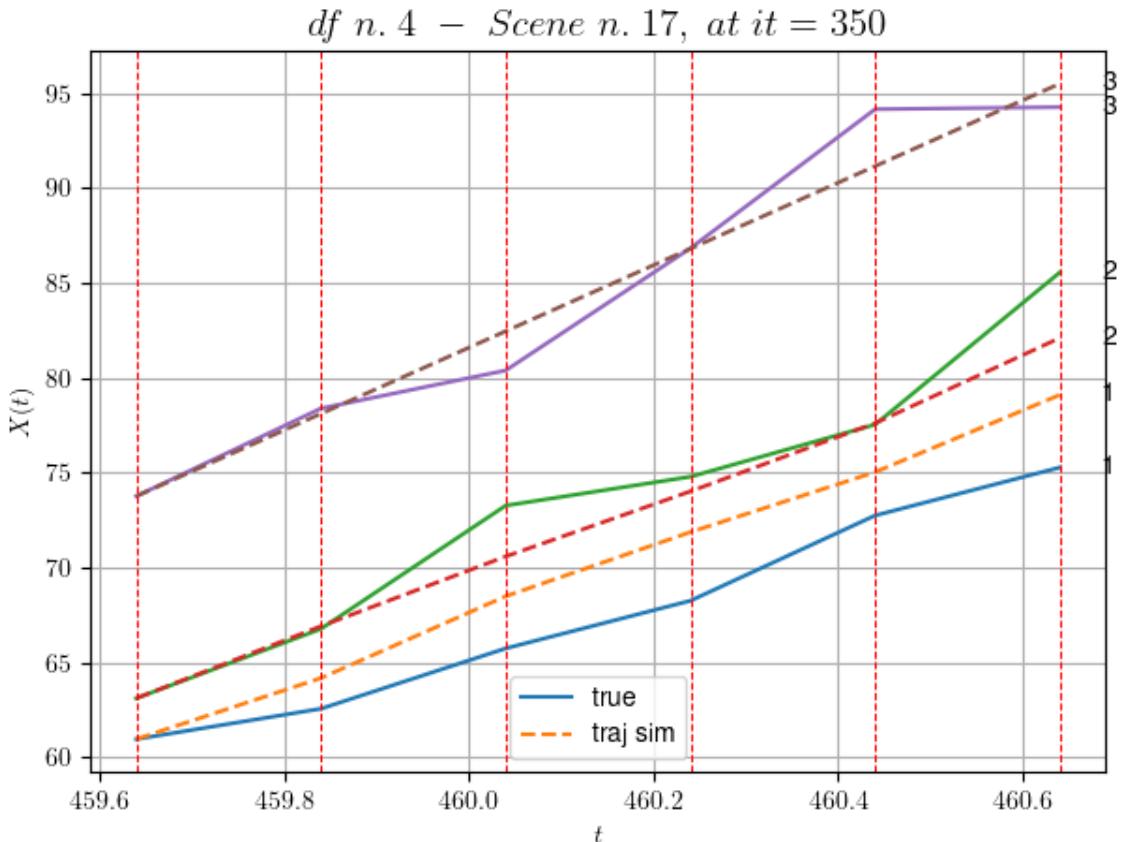
1.749537222117457]

---



---

- \* err= 4.32106392588667
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 0.001367564538857671



For scene 17/30

- \* use LR\_NN=0.001 with err=10.305755959814526 at it=19
- \* v0\_scn\_mean = 22.456659929267563
- \* MAE = 4.1291885313516286

---



---

- Time interval n.0: [493.84, 494.04]
  - \* y\_true: [22.94003108 21.75102788]
  - \* v\_ann: [22.458877563476562, 24.74826431274414, 2

0.43701074020977]

---



---

- Time interval n.1: [494.04, 494.24]
  - \* y\_true: [17.14085991 24.35137427]
  - \* v\_ann: [20.810691833496094, 24.85012435913086, 2

0.43701074020977]

```
- Time interval n.2: [494.24, 494.44]
  * y_true: [21.88131212 25.00167951]
  * v_ann: [24.87838363647461, 23.359548568725586, 2
0.43701074020977]

-----
- Time interval n.3: [494.44, 494.64]
  * y_true: [18.45125037 31.00249487]
  * v_ann: [23.414958953857422, 23.633695602416992, 2
0.43701074020977]

-----
- Time interval n.4: [494.64, 494.84]
  * y_true: [23.98189292 7.35066295]
  * v_ann: [19.684965133666992, 20.19607162475586, 2
0.43701074020977]

-----
- Time interval n.5: [494.84, 495.04]
  * y_true: [24.94226236 24.20238954]
  * v_ann: [24.922340393066406, 23.30164909362793, 2
0.43701074020977]

-----
- Time interval n.6: [495.04, 495.24]
  * y_true: [23.43243252 31.70363737]
  * v_ann: [25.01645278930664, 21.84259796142578, 20.
43701074020977]

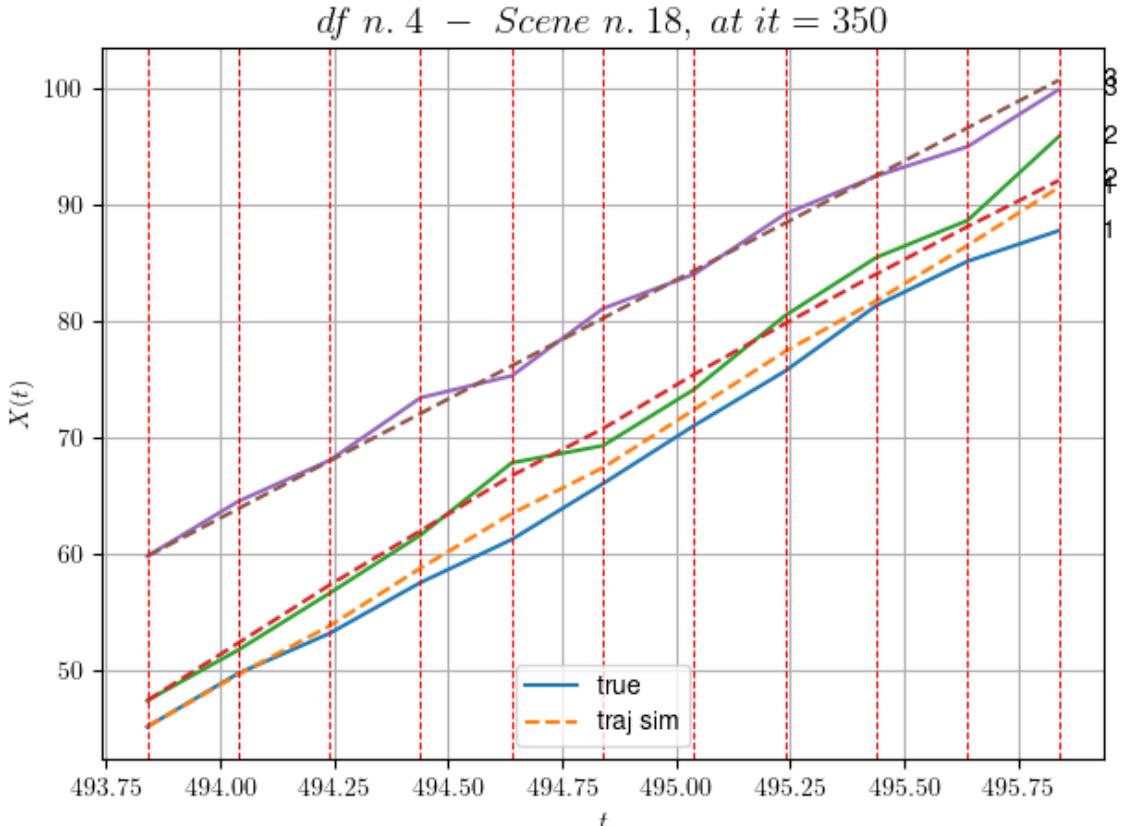
-----
- Time interval n.7: [495.24, 495.44]
  * y_true: [28.10335872 24.95329593]
  * v_ann: [21.7645206451416, 21.275447845458984, 20.
43701074020977]

-----
- Time interval n.8: [495.44, 495.64]
  * y_true: [18.99250639 15.85230368]
  * v_ann: [23.732135772705078, 20.32255744934082, 2
0.43701074020977]

-----
- Time interval n.9: [495.64, 495.84]
  * y_true: [13.12188353 36.00587838]
  * v_ann: [24.90970230102539, 19.776220321655273, 2
0.43701074020977]

-----
* err= 1.8169208175921359
```

\* Learning rate NN = 0.00013508510892279446  
 \* diff = 0.0008269334288035779



For scene 18/30

\* use LR\_NN=0.001 with err=58.57605804369732 at it=19  
 \* v0\_scn\_mean = 21.256626201291553  
 \* MAE = 1.761465894804249

---



---

- Time interval n.0: [520.04, 520.24]
  - \* y\_true: [17.72000935 17.53021327]
  - \* v\_ann: [20.756589889526367, 21.89824867248535, 25.96283649925432]
- Time interval n.1: [520.24, 520.44]
  - \* y\_true: [21.19003079 20.68032877]
  - \* v\_ann: [20.304983139038086, 21.09306526184082, 25.96283649925432]
- Time interval n.2: [520.44, 520.64]
  - \* y\_true: [20.95006602 20.21041565]
  - \* v\_ann: [20.313161849975586, 21.114473342895508, 25.96283649925432]
- Time interval n.3: [520.64, 520.84]

```
* y_true: [19.83010584 22.72061589]
* v_ann: [20.275592803955078, 21.1212158203125, 25.
96283649925432]

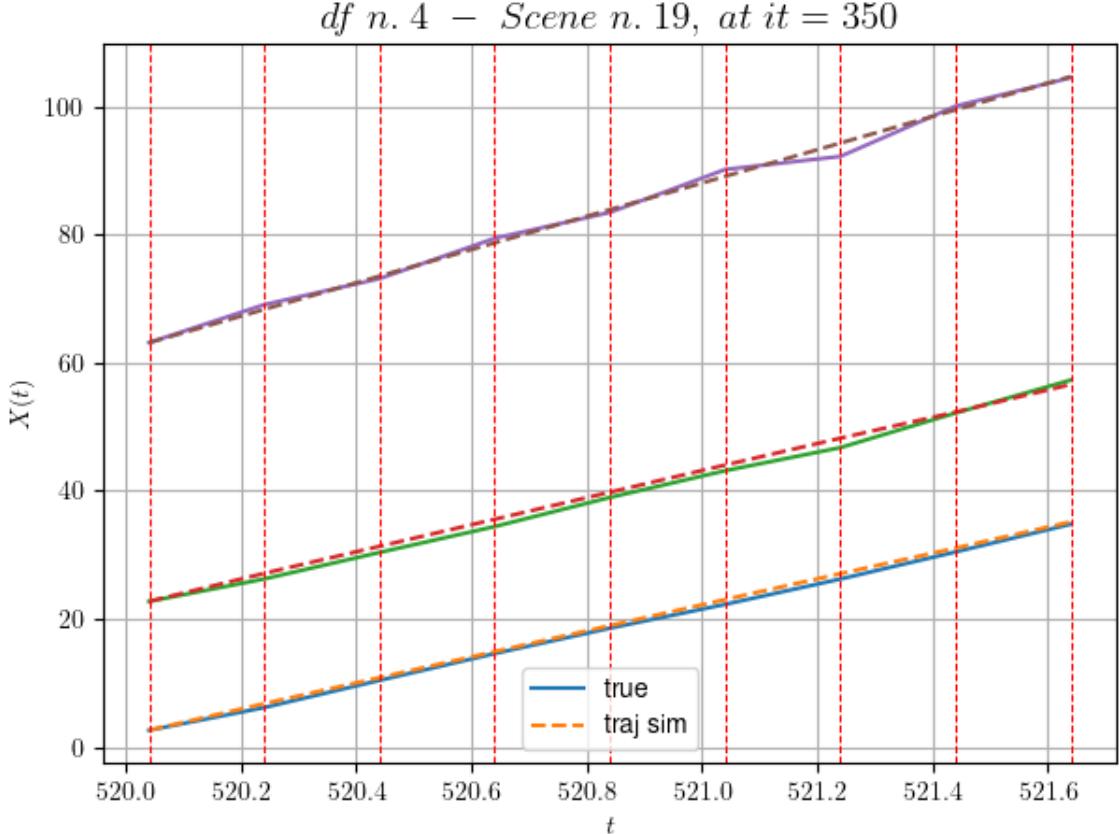
-----
- Time interval n.4: [520.84, 521.04]
* y_true: [18.57015207 20.87066157]
* v_ann: [20.347347259521484, 21.21579360961914, 2
5.96283649925432]

-----
- Time interval n.5: [521.04, 521.24]
* y_true: [19.76022757 18.03074501]
* v_ann: [20.207914352416992, 20.960506439208984, 2
5.96283649925432]

-----
- Time interval n.6: [521.24, 521.44]
* y_true: [21.18033214 27.03127071]
* v_ann: [19.957252502441406, 20.39018440246582, 2
5.96283649925432]

-----
- Time interval n.7: [521.44, 521.64]
* y_true: [21.65044512 25.69152055]
* v_ann: [20.497608184814453, 21.563100814819336, 2
5.96283649925432]

-----
* err= 0.6246168885825857
* Learning rate NN = 2.058910467894748e-05
* diff = 0.0000004501721704667
```



For scene 19/30

\* use LR\_NN=0.0001 with err=26.966129389350808 at it=19  
 \* v0\_scn\_mean = 26.308849815199302  
 \* MAE = 0.6210771440922866

---



---

- Time interval n.0: [550.44, 550.64]  
 \* y\_true: [23.95217582 22.66294351]  
 \* v\_ann: [24.140602111816406, 23.3663272857666, 20.  
 14846882256258]

---

- Time interval n.1: [550.64, 550.84]  
 \* y\_true: [22.2022957 28.49416646]  
 \* v\_ann: [23.697568893432617, 23.1148624420166, 20.  
 14846882256258]

---

- Time interval n.2: [550.84, 551.04]  
 \* y\_true: [19.80228834 20.61332089]  
 \* v\_ann: [25.379179000854492, 23.75710678100586, 2  
 0.14846882256258]

---

- Time interval n.3: [551.04, 551.24]  
 \* y\_true: [31.50413614 18.88333685]  
 \* v\_ann: [21.79815101623535, 22.07716941833496, 20.

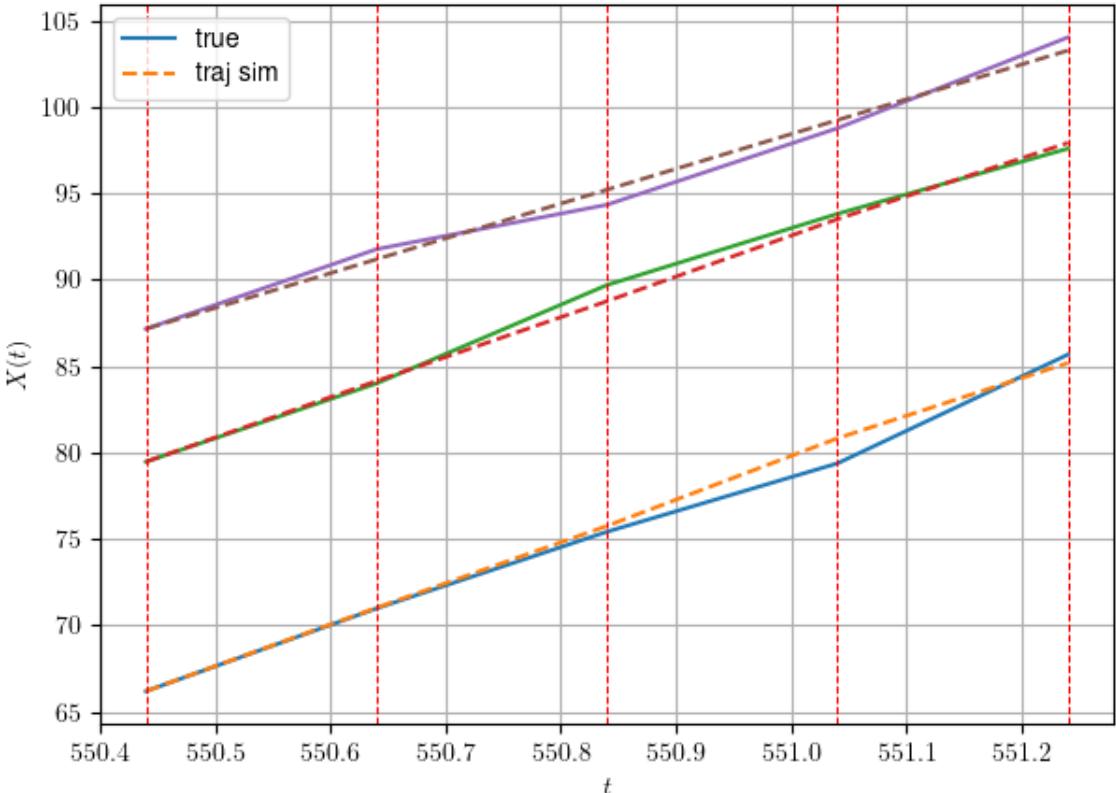
14846882256258]

```

* err= 0.3644612382555045
* Learning rate NN = 0.000478296831715852
* diff = 0.0006823050264592734

```

df n. 4 – Scene n. 20, at it = 350



For scene 20/30

```

* use LR_NN=0.001 with err=15.134337088244465 at it=19
* v0_scn_mean = 20.99281435605704
* MAE = 0.3644612382555045

```

```

=====
=====
- Time interval n.0: [554.64, 554.84]
  * y_true: [16.3871362 34.43556815]
  * v_ann: [25.32223129272461, 24.843978881835938, 2
  0.440796892460163]
=====
```

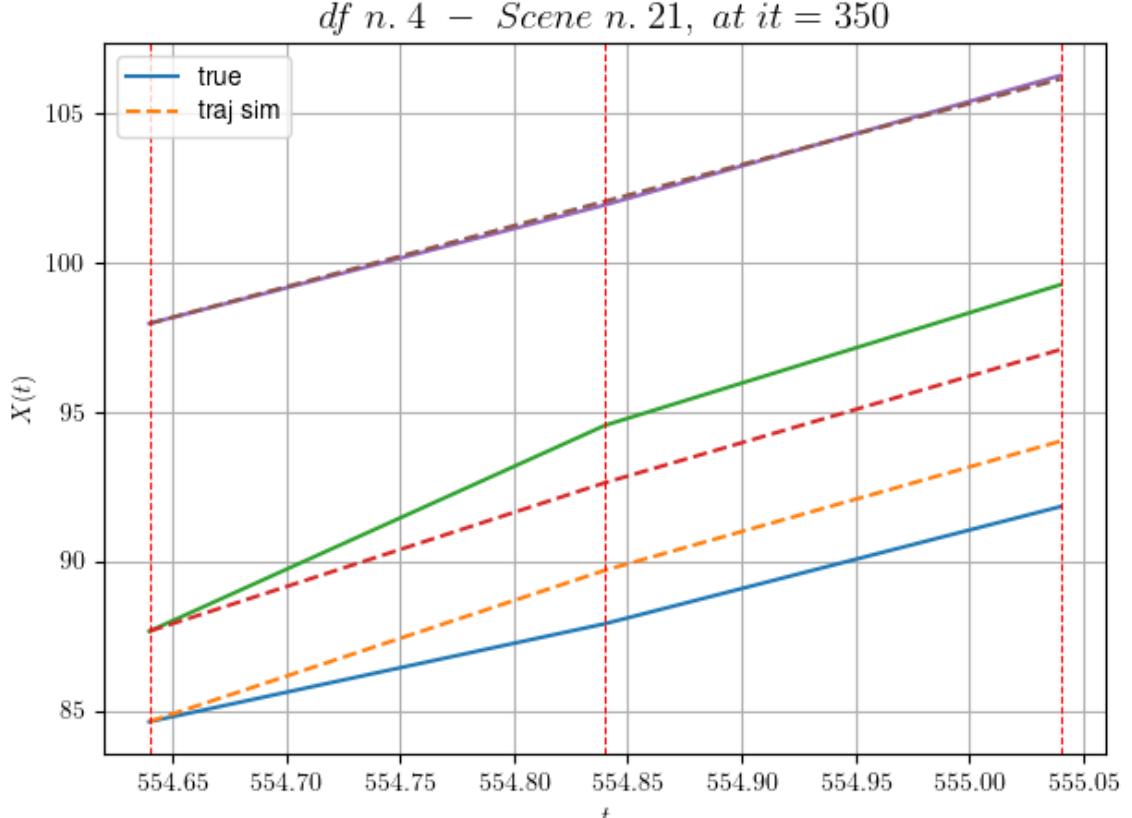
```

=====
=====
- Time interval n.1: [554.84, 555.04]
  * y_true: [19.58824641 23.53414882]
  * v_ann: [21.600339889526367, 22.277767181396484, 2
  0.440796892460163]
=====
```

```

* err= 1.8226244268549792
* Learning rate NN = 0.0007289999630302191
* diff = 0.002136495377448311

```



For scene 21/30

- \* use LR\_NN=0.001 with err=2.421358225180852 at it=19
- \* v0\_scn\_mean = 21.260087853656835
- \* MAE = 1.8226244268549792

---



---

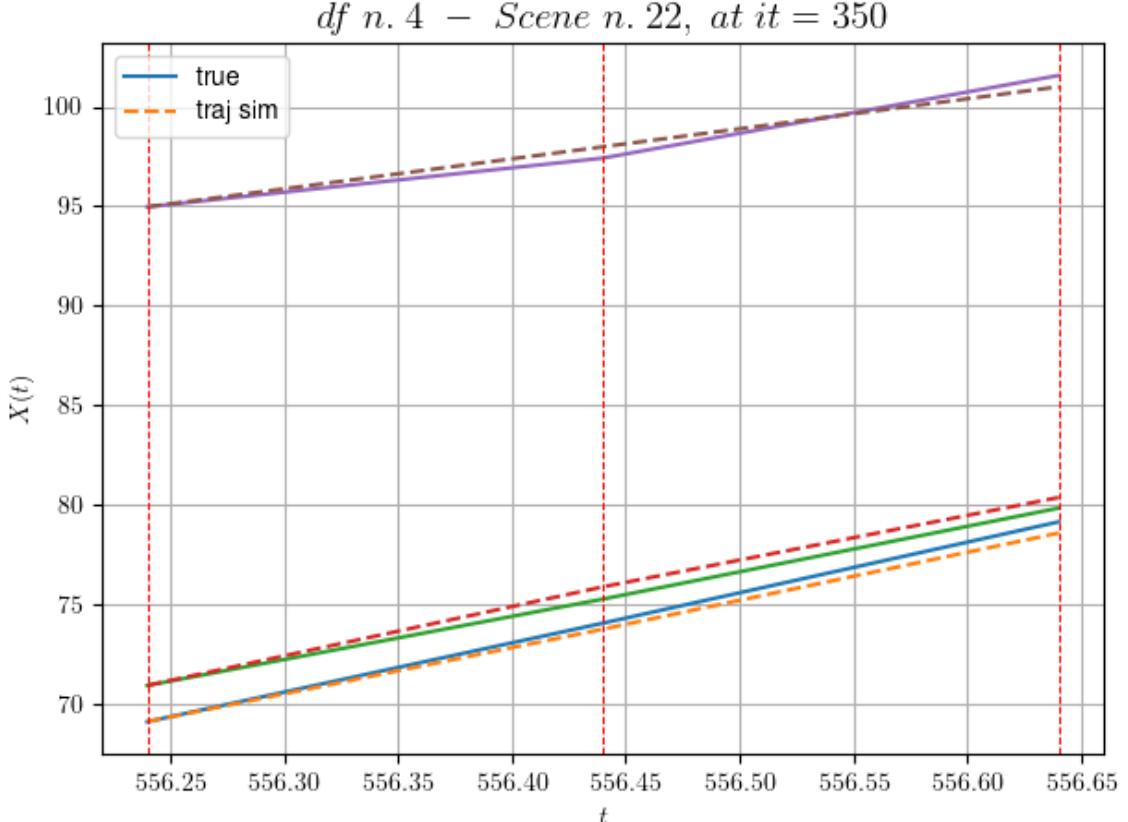
- Time interval n.0: [556.24, 556.44]
- \* y\_true: [24.75252122 21.70224237]
- \* v\_ann: [23.250869750976562, 24.779582977294922, 1  
5.086200202024516]

---

- Time interval n.1: [556.44, 556.64]
- \* y\_true: [25.4427559 22.85265518]
- \* v\_ann: [24.14167594909668, 22.43836784362793, 15.  
086200202024516]

---

- \* err= 0.18992778025127222
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 1.6436918635648334e-05



For scene 22/30

\* use LR\_NN=0.001 with err=12.695255193244533 at it=19  
 \* v0\_scn\_mean = 16.36441777247617  
 \* MAE = 0.18646435083691815

---



---

- Time interval n.0: [575.04, 575.24]  
 \* y\_true: [25.50060057 18.90068968]  
 \* v\_ann: [-2.1514815671253018e-05, 0.0, 24.54566091  
 9825842]

---

- Time interval n.1: [575.24, 575.44]  
 \* y\_true: [27.95087423 28.65128625]  
 \* v\_ann: [-0.00017826091789174825, 0.0, 24.54566091  
 9825842]

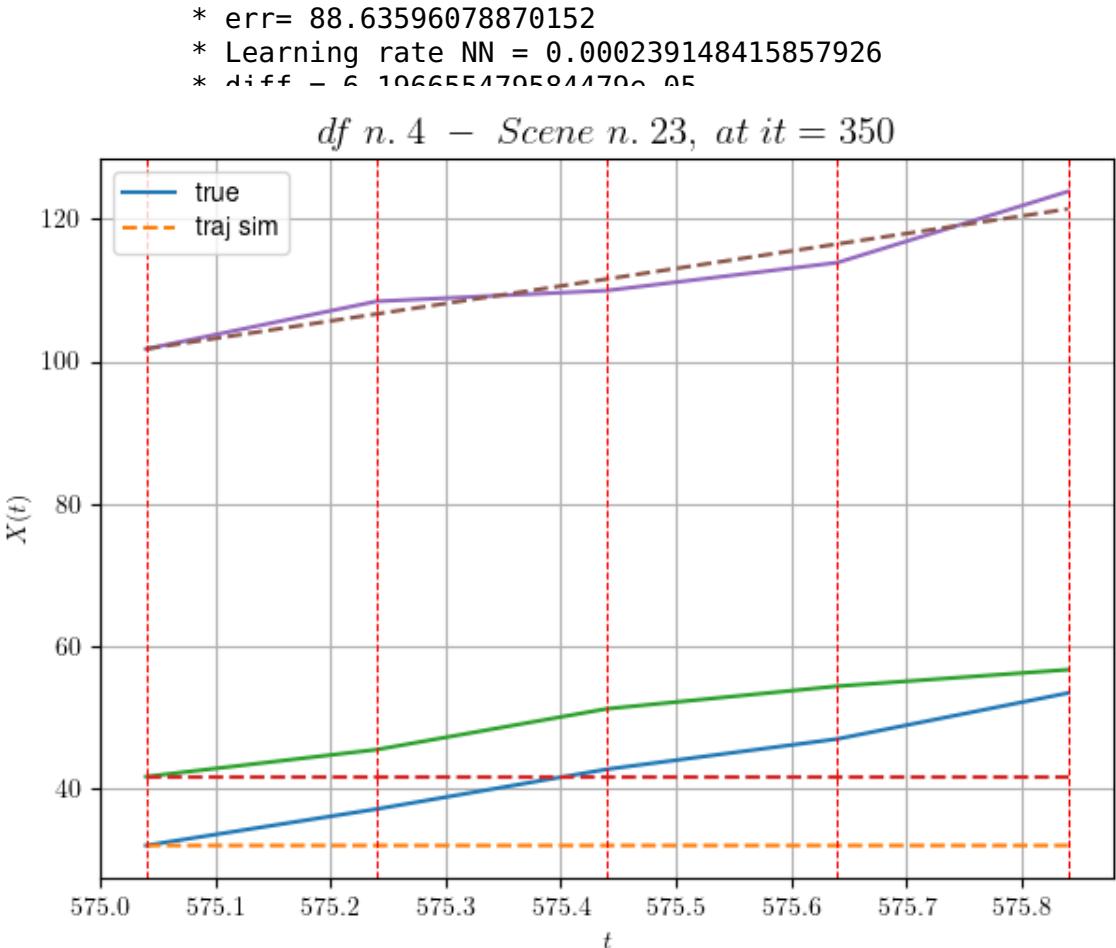
---

- Time interval n.2: [575.44, 575.64]  
 \* y\_true: [21.25083564 15.85084753]  
 \* v\_ann: [-0.00014810121501795948, 0.0, 24.54566091  
 9825842]

---

- Time interval n.3: [575.64, 575.84]  
 \* y\_true: [32.20158375 11.5506833 ]  
 \* v\_ann: [-9.707365097710863e-05, 0.0, 24.545660919

825842]



For scene 23/30

- \* use LR\_NN=0.0005 with err=42.850516686955366 at it=19
- \* v0\_scn\_mean = 25.013136153629894
- \* MAE = 26.907419164158625

---



---

- Time interval n.0: [313.84, 314.04]
  - \* y\_true: [15.70108851 23.28855659 11.30165534]
  - \* v\_ann: [22.64192008972168, 28.959518432617188, 3 0.531089782714844, 26.41603907656751]

---



---



---

- Time interval n.1: [314.04, 314.24]
  - \* y\_true: [25.15198981 24.43240479 30.10483754]
  - \* v\_ann: [20.029895782470703, 19.935029983520508, 1 9.792964935302734, 26.41603907656751]

---



---



---

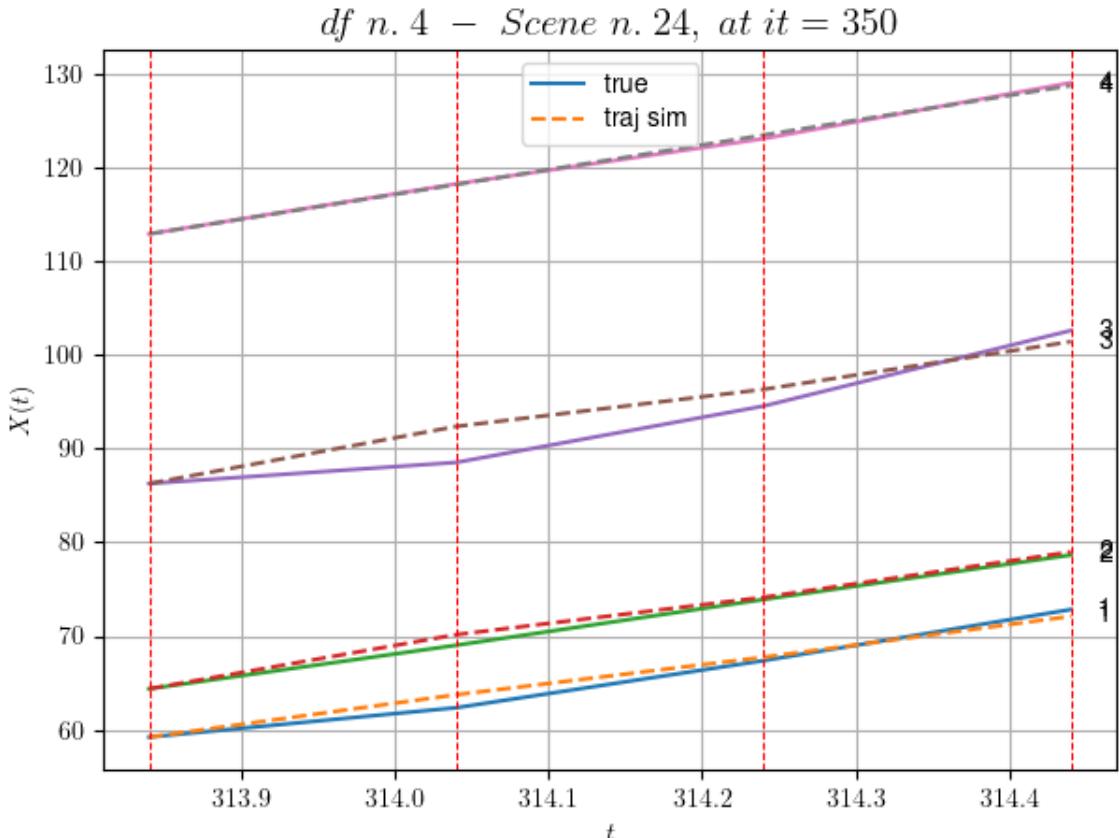
- Time interval n.2: [314.24, 314.44]
  - \* y\_true: [27.30252596 23.75264682 40.35752125]
  - \* v\_ann: [21.848129272460938, 24.22958755493164, 2 5.501392364501953, 26.41603907656751]

---

```

* err= 1.479902127987051
* Learning rate NN = 0.0002952449722215533
* diff = 0.0005969971377526306

```



For scene 24/30

```

* use LR_NN=0.0005 with err=9.756906705951701 at it=19
* v0_scn_mean = 26.82511486045004
* MAE = 1.4441361039355427

```

---



---

- Time interval n.0: [460.84, 461.04]  
\* y\_true: [19.8211655 14.23151831 20.23251805]  
\* v\_ann: [18.7023983001709, 18.070554733276367, 19.  
13417625427246, 26.404825675262657]

---



---

- Time interval n.1: [461.04, 461.24]  
\* y\_true: [19.5413591 21.77263281 16.55223683]  
\* v\_ann: [18.466012954711914, 18.85015869140625, 1  
8.924114227294922, 26.404825675262657]

---

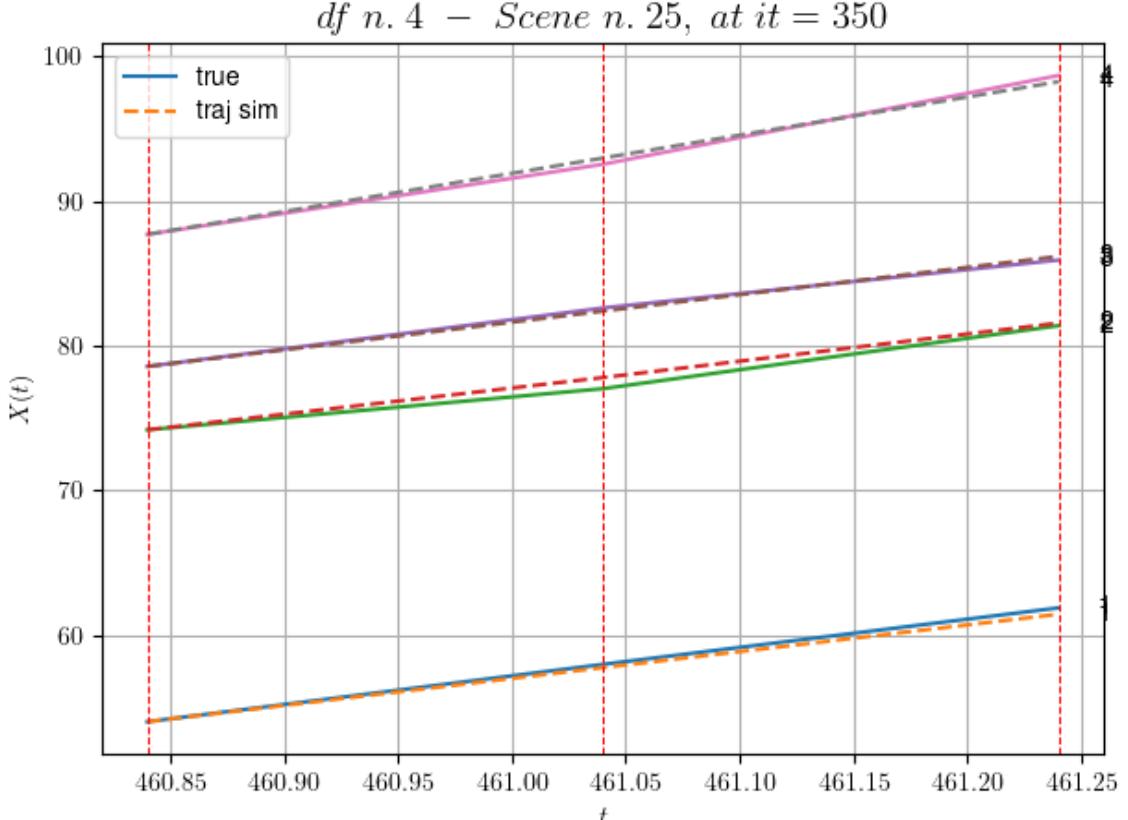


---

```

* err= 0.1123988118500499
* Learning rate NN = 0.00036449998151510954
* diff = 2.7721693929172453e-05

```



For scene 25/30

- \* use LR\_NN=0.0005 with err=2.5994541813321757 at it=19
- \* v0\_scn\_mean = 26.81518136454271
- \* MAE = 0.10801100815545572

---



---

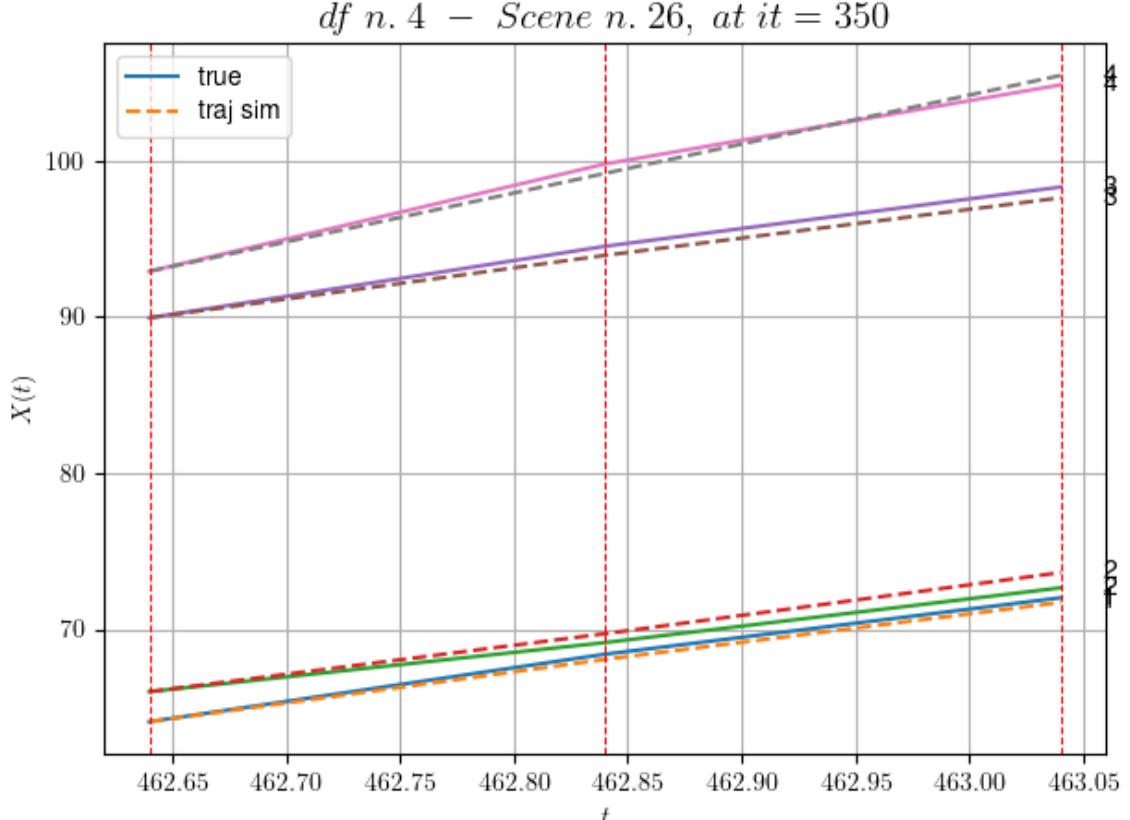
- Time interval n.0: [462.64, 462.84]
- \* y\_true: [21.60177307 15.7113741 22.90372044]
- \* v\_ann: [19.950916290283203, 18.5548152923584, 20.009201049804688, 31.352254948017134]

---

- Time interval n.1: [462.84, 463.04]
- \* y\_true: [18.06167929 17.53172974 18.9633766 ]
- \* v\_ann: [18.228736877441406, 19.570064544677734, 18.41077423095703, 31.352254948017134]

---

- \* err= 0.2504955069260826
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 0.00011062523212107545



For scene 26/30

- \* use LR\_NN=0.001 with err=7.508316343909967 at it=19
- \* v0\_scn\_mean = 31.19790763098814
- \* MAE = 0.22853710607366345

---



---

- Time interval n.0: [495.24, 495.44]
- \* y\_true: [12.91123632 28.10335872 24.95329593]
- \* v\_ann: [21.869081497192383, 22.080095291137695, 2  
3.111684799194336, 16.439733421153687]

---

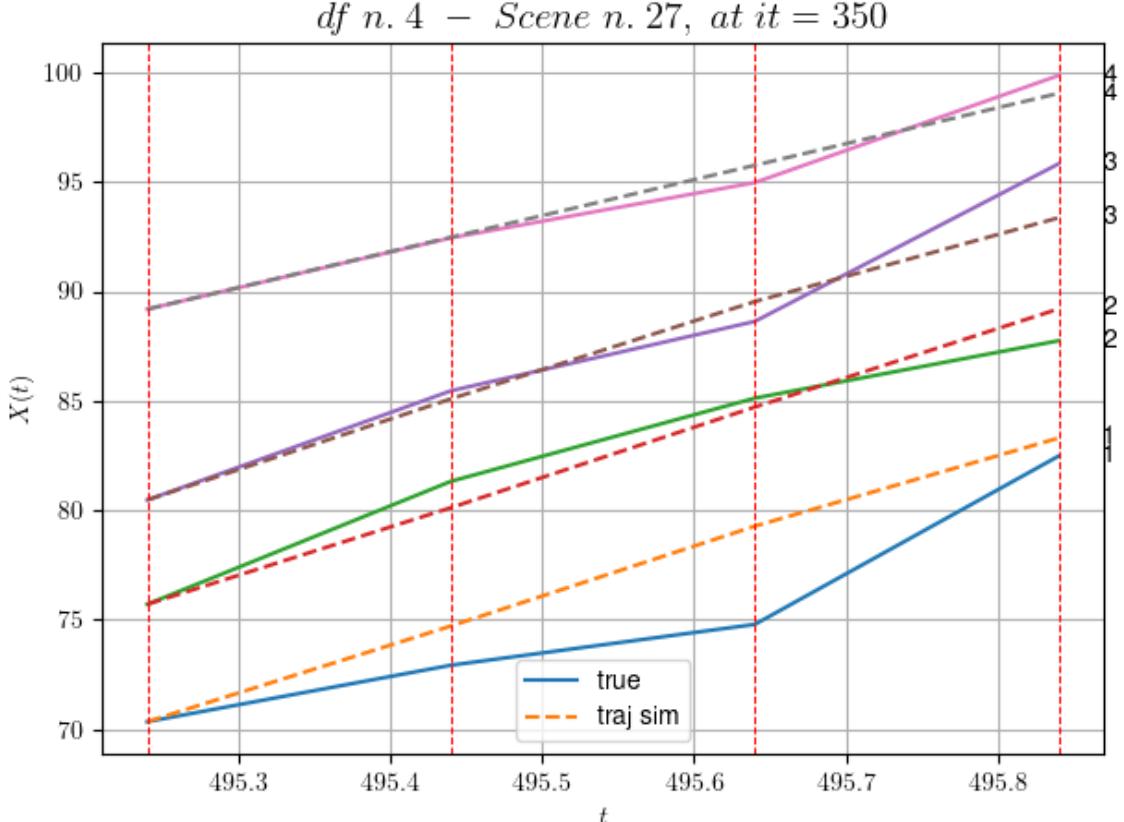
- Time interval n.1: [495.44, 495.64]
- \* y\_true: [ 9.32105302 18.99250639 15.85230368]
- \* v\_ann: [22.80459213256836, 22.974502563476562, 2  
2.22264862060547, 16.439733421153687]

---

- Time interval n.2: [495.64, 495.84]
- \* y\_true: [38.46439916 13.12188353 36.00587838]
- \* v\_ann: [20.139745712280273, 22.439847946166992, 1  
9.152381896972656, 16.439733421153687]

---

- \* err= 2.255773693837128
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.00020600614994092936



For scene 27/30

- \* use LR\_NN=0.001 with err=10.35603640027085 at it=19
- \* v0\_scn\_mean = 17.987511647231347
- \* MAE = 2.2452146115868894

---



---

- Time interval n.0: [541.84, 542.04]
  - \* y\_true: [15.49040827 18.57067001 15.06113134]
  - \* v\_ann: [18.69593620300293, 18.869976043701172, 1 8.8649845123291, 25.31225808344114]

---

- Time interval n.1: [542.04, 542.24]
  - \* y\_true: [18.02057424 22.22093452 14.29121645]
  - \* v\_ann: [17.945093154907227, 17.281620025634766, 1 7.177200317382812, 25.31225808344114]

---

- Time interval n.2: [542.24, 542.44]
  - \* y\_true: [23.32090187 15.10072652 30.16295254]
  - \* v\_ann: [18.130884170532227, 17.845962524414062, 1 7.707096099853516, 25.31225808344114]

---

- Time interval n.3: [542.44, 542.64]
  - \* y\_true: [17.96079787 19.72113387 17.42186984]
  - \* v\_ann: [19.649763107299805, 21.381343841552734, 2

1.762331008911133, 25.31225808344114]

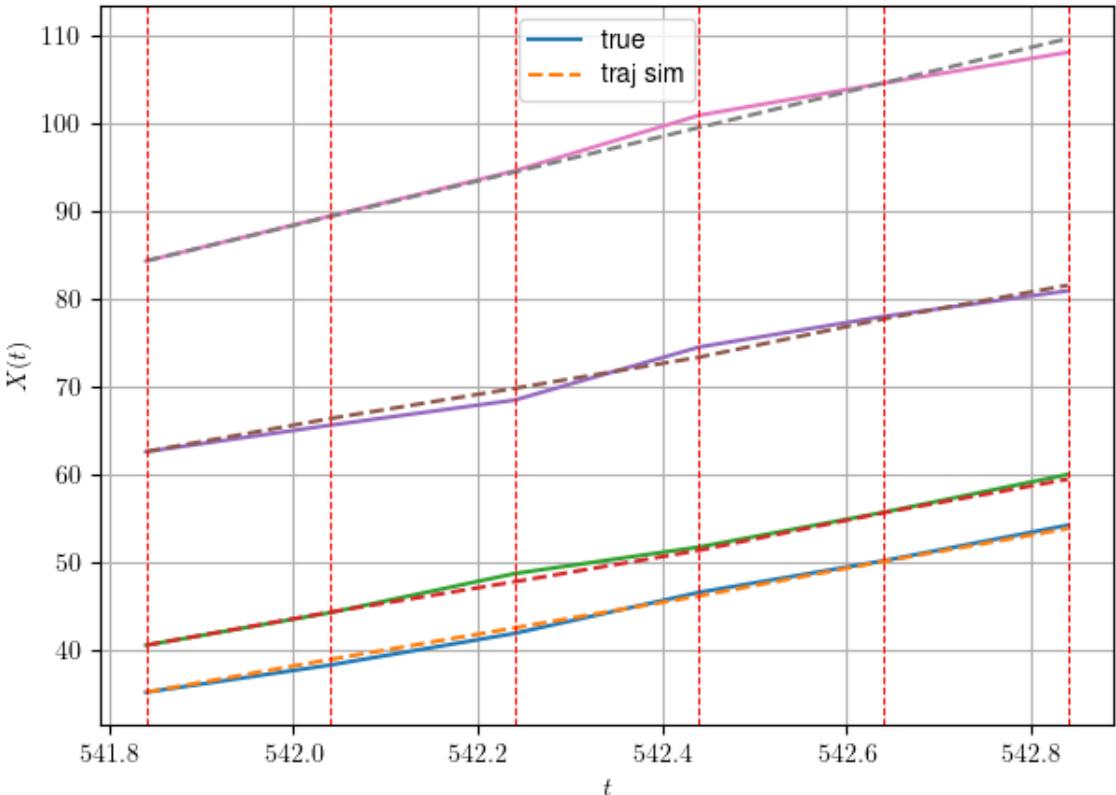
---

- Time interval n.4: [542.64, 542.84]
  - \* y\_true: [20.261096 21.55138585 14.58174174]
  - \* v\_ann: [18.742782592773438, 19.06770896911621, 1 9.16286849975586, 25.31225808344114]

---

- \* err= 0.4593640296225563
- \* Learning rate NN = 0.0003874204121530056
- \* diff = 5.0622152553728824e-05

*df n. 4 – Scene n. 28, at it = 350*



For scene 28/30

- \* use LR\_NN=0.001 with err=14.473102507061494 at it=19
- \* v0\_scn\_mean = 25.847320194921725
- \* MAE = 0.4593640296225563

---



---

- Time interval n.0: [559.04, 559.24]
  - \* y\_true: [23.32160164 21.40183754 23.15354324]
  - \* v\_ann: [18.64219856262207, 18.681156158447266, 1 8.64259147644043, 21.821996764913973]

---



---



---

- Time interval n.1: [559.24, 559.44]
  - \* y\_true: [16.34126249 10.38103794 18.30306556]
  - \* v\_ann: [18.862768173217773, 19.08828353881836, 1 8.865188598632812, 21.821996764913973]

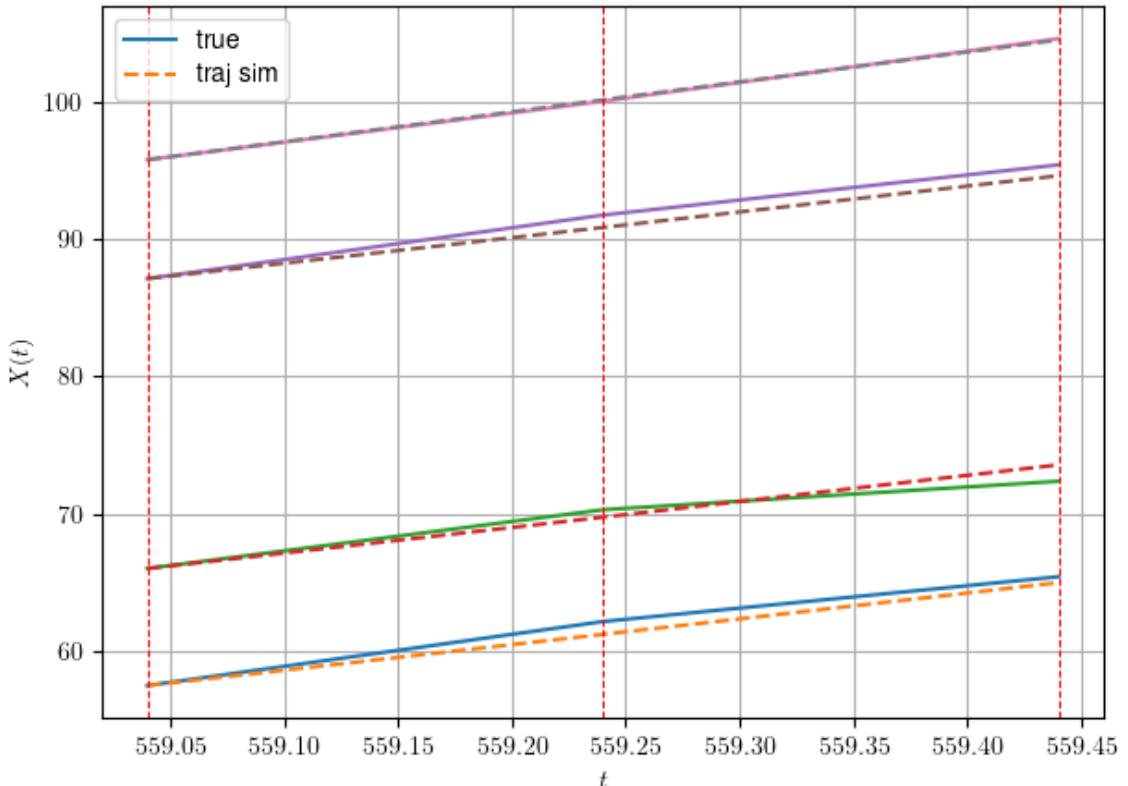
---

```

* err= 0.35423182332236847
* Learning rate NN = 7.289998757187277e-05
* diff = 6.294662832162512e-05

```

*df n. 4 – Scene n. 29, at it = 350*



For scene 29/30

```

* use LR_NN=0.0001 with err=5.300345155872652 at it=19
* v0_scn_mean = 22.755439722429433
* MAE = 0.35423182332236847

```

---



---

For df=4 with 30 scenes, time taken: 396.17

---



---

In df n.5/10 we have 14 scenes

---



---

- Time interval n.0: [23.72, 23.92]
  - \* y\_true: [21.79018354 24.07032953]
  - \* v\_ann: [23.421003341674805, 20.217792510986328, 24.53484322511012]
  
- Time interval n.1: [23.92, 24.12]
  - \* y\_true: [25.91031727 27.52052784]

```
* v_ann: [22.716745376586914, 21.60184669494629, 2
4.53484322511012]
```

---

```
- Time interval n.2: [24.12, 24.32]
* y_true: [19.61033273 24.42062846]
* v_ann: [24.16120719909668, 25.58684730529785, 24.
```

```
53484322511012]
```

---

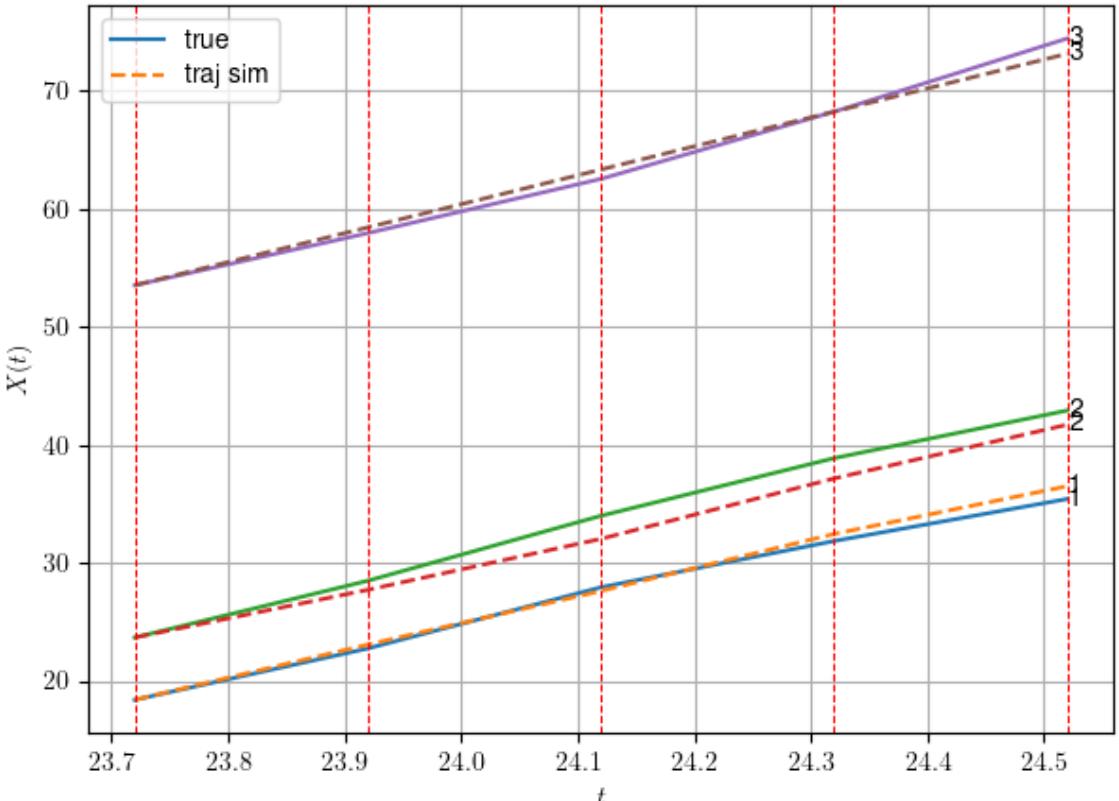
```
- Time interval n.3: [24.32, 24.52]
* y_true: [17.8304062 20.21066815]
* v_ann: [20.260242462158203, 22.80820083618164, 2
```

```
4.53484322511012]
```

---

```
* err= 0.873348974413633
* Learning rate NN = 0.000478296831715852
* diff = 0.00011795926519408972
```

*df n. 5 – Scene n. 0, at it = 350*



For scene 0/14

```
* use LR_NN=0.001 with err=17.792911360729892 at it=19
* v0_scn_mean = 25.00324561146116
* MAE = 0.3685184227583574
```

---



---



---

```
- Time interval n.0: [28.12, 28.32]
* y_true: [22.39001619 28.9506918 ]
```

```
* v_ann: [26.880178451538086, 25.126413345336914, 2
5.379417180280793]
```

---

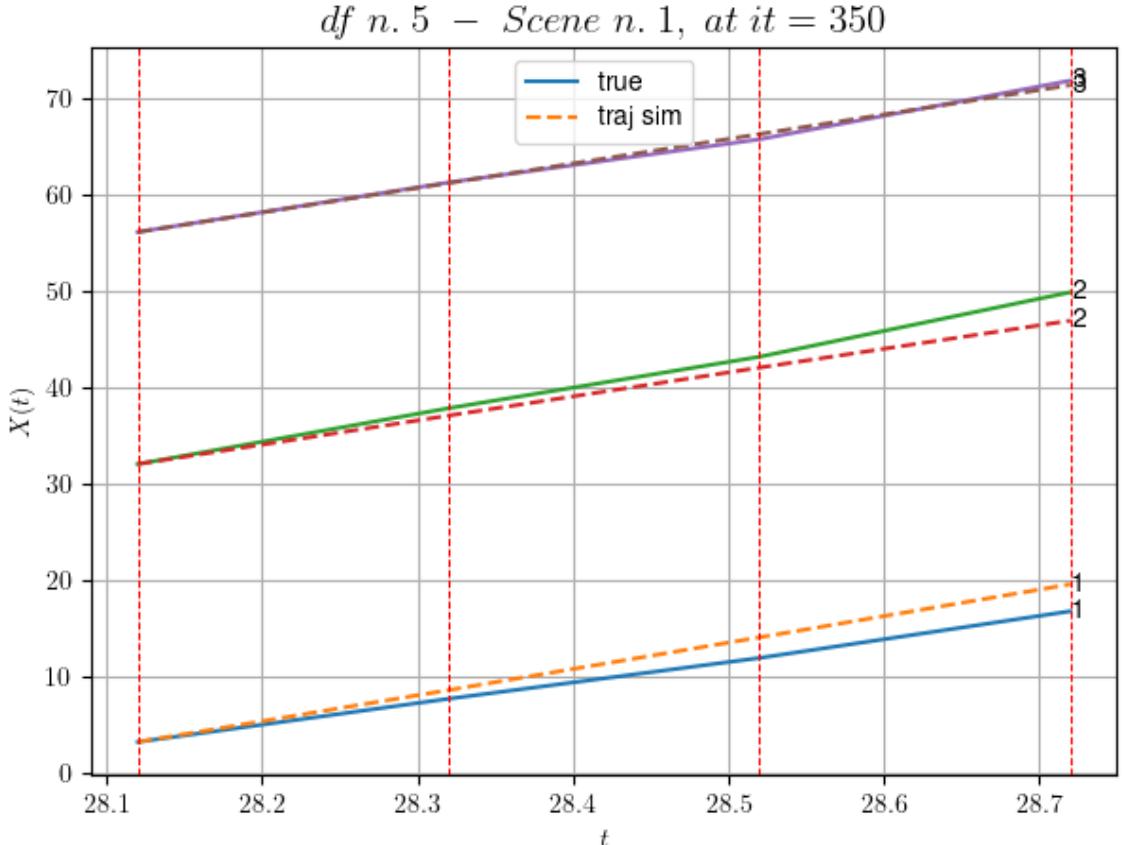
```
- Time interval n.1: [28.32, 28.52]
* y_true: [21.14004613 26.65085251]
* v_ann: [27.327573776245117, 24.85765266418457, 2
5.379417180280793]
```

---

```
- Time interval n.2: [28.52, 28.72]
* y_true: [24.23010561 33.45140848]
* v_ann: [27.509401321411133, 24.365610122680664, 2
5.379417180280793]
```

---

```
* err= 2.0149383728445085
* Learning rate NN = 2.952449540316593e-05
* diff = 0.003176261656155255
```



For scene 1/14

```
* use LR_NN=5e-05 with err=4.730739080412236 at it=19
* v0_scn_mean = 25.775433636575954
* MAE = 2.0149383728445085
```

---



---

```
- Time interval n.0: [146.52, 146.72]
* y_true: [32.70054419 14.69037585]
```

```

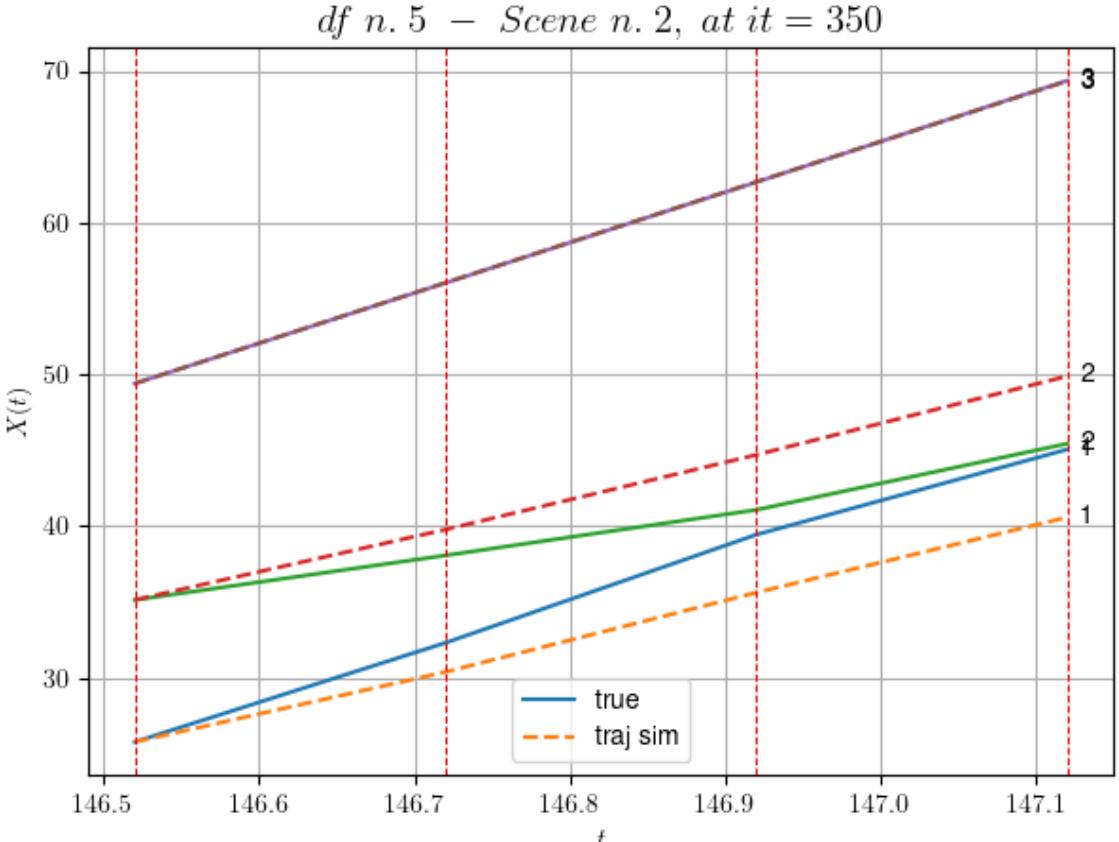
* v_ann: [23.083049774169922, 23.21006965637207, 3
3.2471618145075]

-----
- Time interval n.1: [146.72, 146.92]
* y_true: [35.65090038 15.01046474]
* v_ann: [26.169647216796875, 24.630361557006836, 3
3.2471618145075]

-----
- Time interval n.2: [146.92, 147.12]
* y_true: [28.09191726 21.83491468]
* v_ann: [24.84209632873535, 25.945709228515625, 3
3.2471618145075]

-----
* err= 6.178201651197786
* Learning rate NN = 0.0002952449722215533
* diff = 0.0035834089668789204

```



For scene 2/14

```

* use LR_NN=0.0005 with err=27.74198322142386 at it=19
* v0_scn_mean = 32.96885720122107
* MAE = 5.395849023906141

```

---



---

```

- Time interval n.0: [151.12, 151.32]
* y_true: [20.88055844 29.97204611]

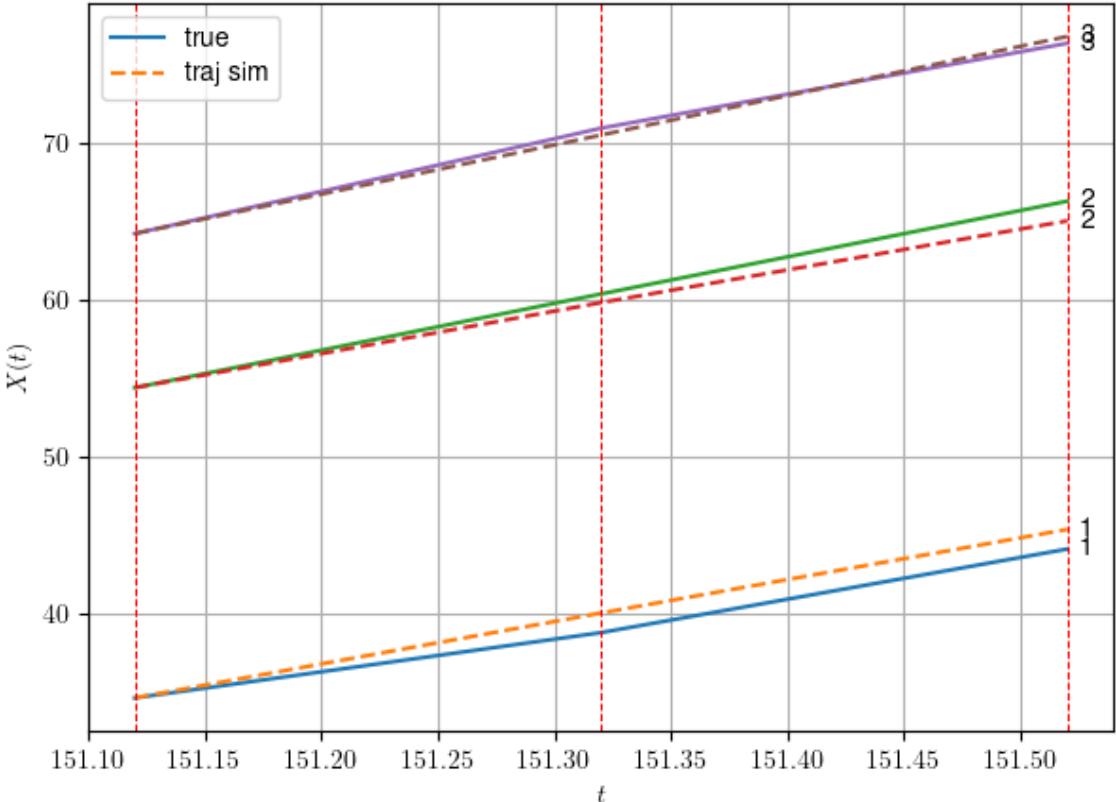
```

```
* v_ann: [27.153322219848633, 27.205642700195312, 3
1.516127782593827]
```

```
- Time interval n.1: [151.32, 151.52]
* y_true: [26.72089495 29.6522691 ]
* v_ann: [26.725534439086914, 26.13864517211914, 3
1.516127782593827]
```

```
* err= 0.6018141510693131
* Learning rate NN = 0.00036449998151510954
* diff = 0.0006362218828247501
```

*df n. 5 – Scene n. 3, at it = 350*



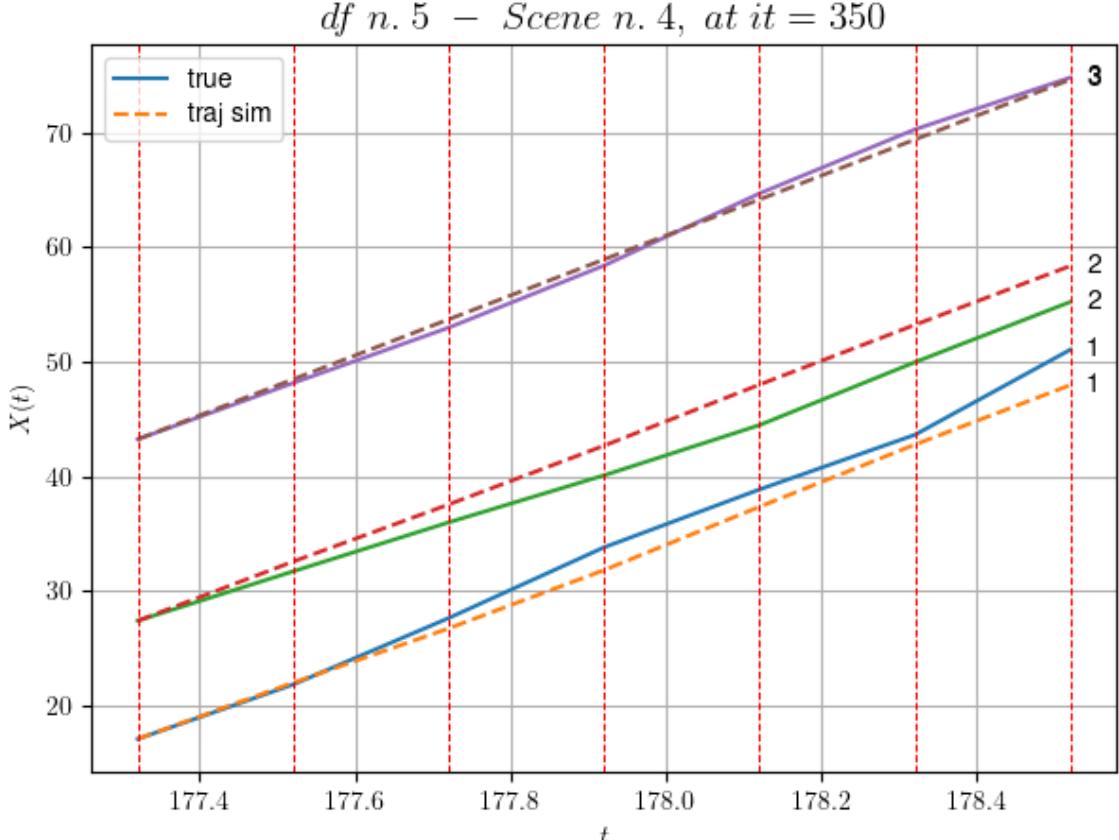
For scene 3/14

```
* use LR_NN=0.0005 with err=5.893891761731727 at it=19
* v0_scn_mean = 31.386184964733086
* MAE = 0.5930872977283039
```

```
=====
=====
- Time interval n.0: [177.32, 177.52]
* y_true: [23.78017477 21.57540501]
* v_ann: [24.56476593017578, 25.839181900024414, 2
6.18040598473106]
```

```
=====
- Time interval n.1: [177.52, 177.72]
* y_true: [28.99044664 21.37044807]
```

```
* v_ann: [23.701921463012695, 24.92745590209961, 2  
6.18040598473106]  
-----  
-----  
- Time interval n.2: [177.72, 177.92]  
* y_true: [30.9005134 20.55062028]  
* v_ann: [25.467979431152344, 25.69280242919922, 2  
6.18040598473106]  
-----  
-----  
- Time interval n.3: [177.92, 178.12]  
* y_true: [25.28069635 21.93575232]  
* v_ann: [27.6586856842041, 26.645689010620117, 26.  
18040598473106]  
-----  
-----  
- Time interval n.4: [178.12, 178.32]  
* y_true: [23.87574209 27.4762805 ]  
* v_ann: [27.157968521118164, 26.109811782836914, 2  
6.18040598473106]  
-----  
-----  
- Time interval n.5: [178.32, 178.52]  
* y_true: [37.1766426 26.34131635]  
* v_ann: [26.01526641845703, 25.745283126831055, 2  
6.18040598473106]  
-----  
-----  
* err= 2.9636374831058103  
* Learning rate NN = 0.00031381050939671695  
* diff = 0.002228957263665343
```



For scene 4/14

- \* use LR\_NN=0.001 with err=36.04604464701102 at it=19
- \* v0\_scn\_mean = 26.507772065035223
- \* MAE = 2.9636374831058103

---



---

- Time interval n.0: [266.92, 267.12]
- \* y\_true: [18.75024149 31.34179995]
- \* v\_ann: [33.34131622314453, 32.143821716308594, 2 9.08570823249343]

---



---

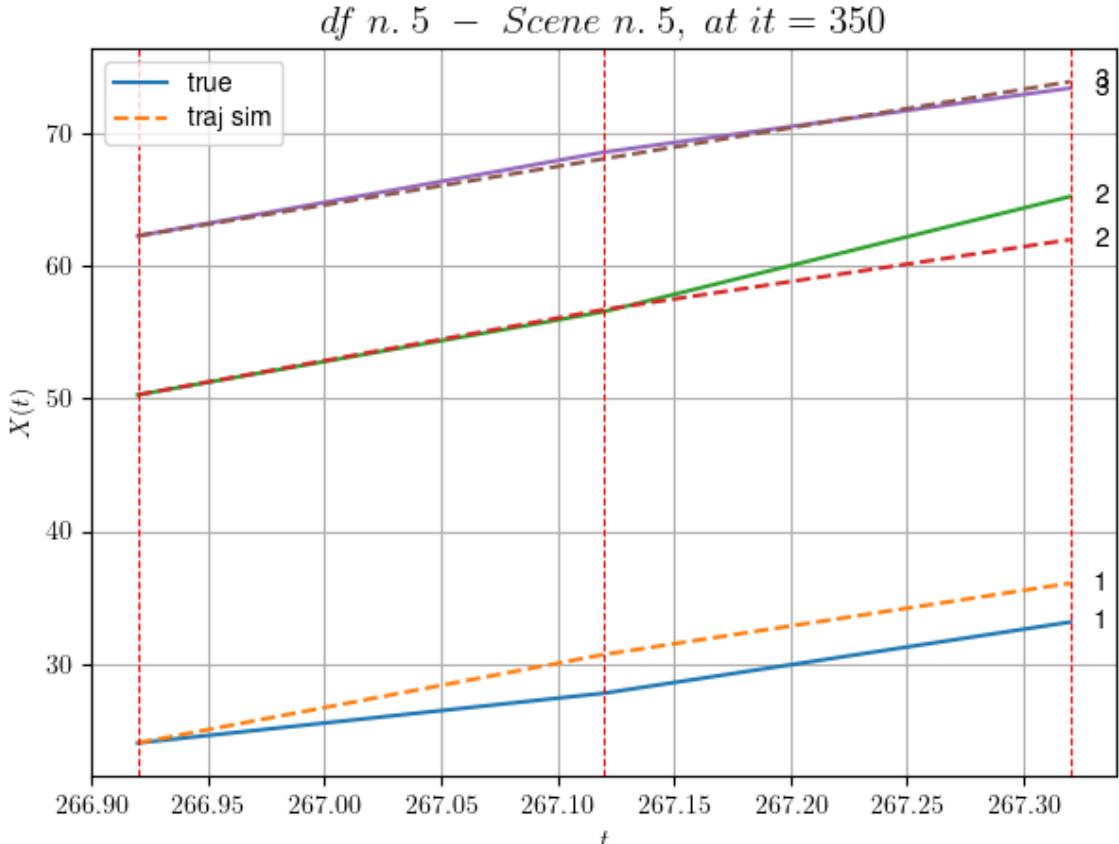
- Time interval n.1: [267.12, 267.32]
- \* y\_true: [26.80047756 43.40316595]
- \* v\_ann: [26.83818244934082, 26.342926025390625, 2 9.08570823249343]

---



---

- \* err= 3.1290779884486493
- \* Learning rate NN = 0.00036449998151510954
- \* diff = 0.0013034622754184433



For scene 5/14

- \* use LR\_NN=0.0005 with err=14.272258043094837 at it=19
- \* v0\_scn\_mean = 29.164069469574038
- \* MAE = 3.1290779884486493

---



---

For scene 6/14

- \* use LR\_NN=0.0005 with err=1.3450165398851002 at it=19
- \* v0\_scn\_mean = 23.162478757942726
- \* MAE = 0.3496306179671786

---



---

For scene 7/14

- \* use LR\_NN=0.001 with err=7.265857725482852 at it=19
- \* v0\_scn\_mean = 27.47495997241978
- \* MAE = 0.03178411577657067

---



---

- Time interval n.0: [330.12, 330.32]
- \* y\_true: [27.05007287 28.28069592]
- \* v\_ann: [25.7887020111084, 28.611398696899414, 35.47864367944545]

---

```

-----  

- Time interval n.1: [330.32, 330.52]  

  * y_true: [28.75016695 26.32589786]  

  * v_ ann: [25.914745330810547, 29.08029556274414, 3  

  5.47864367944545]
-----
```

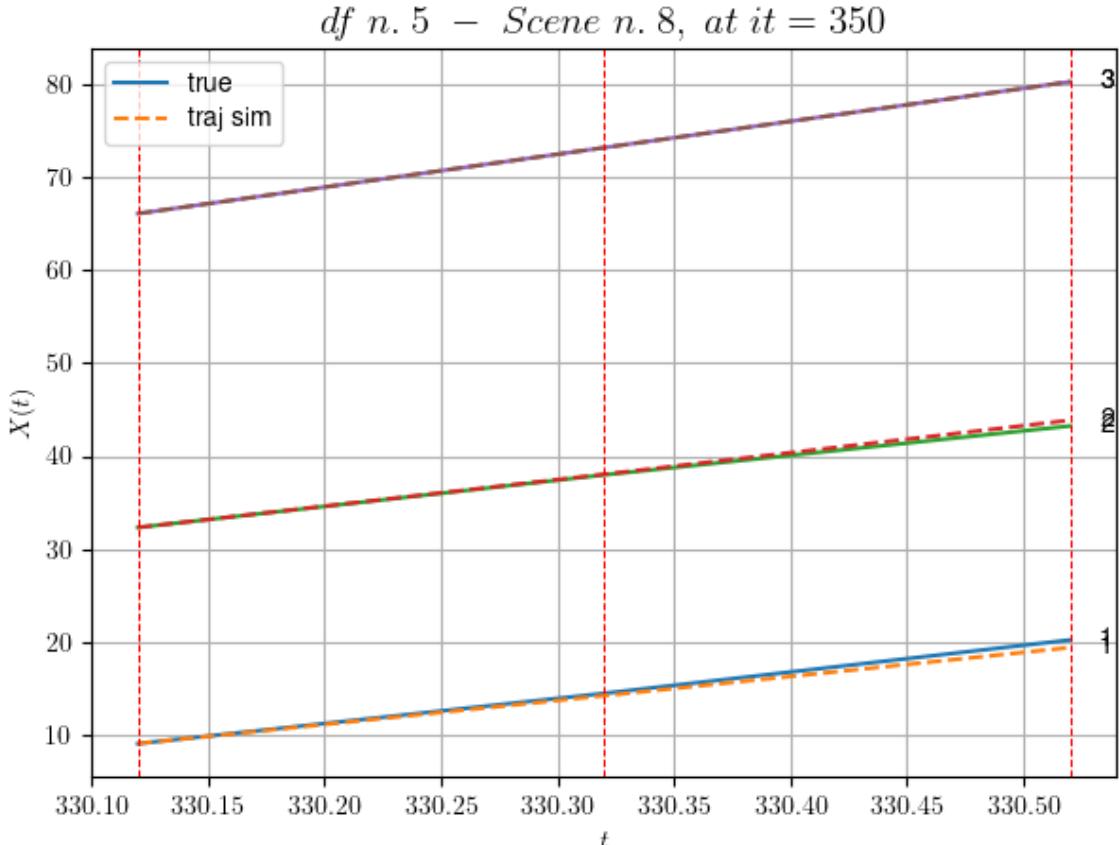
```

-----  

* err= 0.12445321930702706  

* Learning rate NN = 7.289998757187277e-05  

* diff = 0.0033580691318167294
-----
```



For scene 8/14

```

* use LR_NN=0.0001 with err=1.811658651977406 at it=19
* v0_scn_mean = 35.0090853704853
* MAE = 0.12445321930702706
=====
```

```

-----  

- Time interval n.0: [338.52, 338.72]  

  * y_true: [22.83038671 20.44060351]  

  * v_ ann: [23.8142032623291, 23.794095993041992, 27.  

  853943933248644]
-----
```

```

-----  

- Time interval n.1: [338.72, 338.92]  

  * y_true: [25.85061095 23.65082523]  

  * v_ ann: [23.445615768432617, 23.368446350097656, 2  

  7.853943933248644]
-----
```

```

-----  

    - Time interval n.2: [338.92, 339.12]  

      * y_true: [28.6708889 22.23087004]  

      * v_ann: [23.706478118896484, 23.67938232421875, 2  

7.853943933248644]  

-----  

    - Time interval n.3: [339.12, 339.32]  

      * y_true: [26.0610325 19.88098798]  

      * v_ann: [24.05830955505371, 24.17148208618164, 27.  

853943933248644]  

-----  

    - Time interval n.4: [339.32, 339.52]  

      * y_true: [27.9415295 20.92126982]  

      * v_ann: [23.921833038330078, 24.50119400024414, 2  

7.853943933248644]  

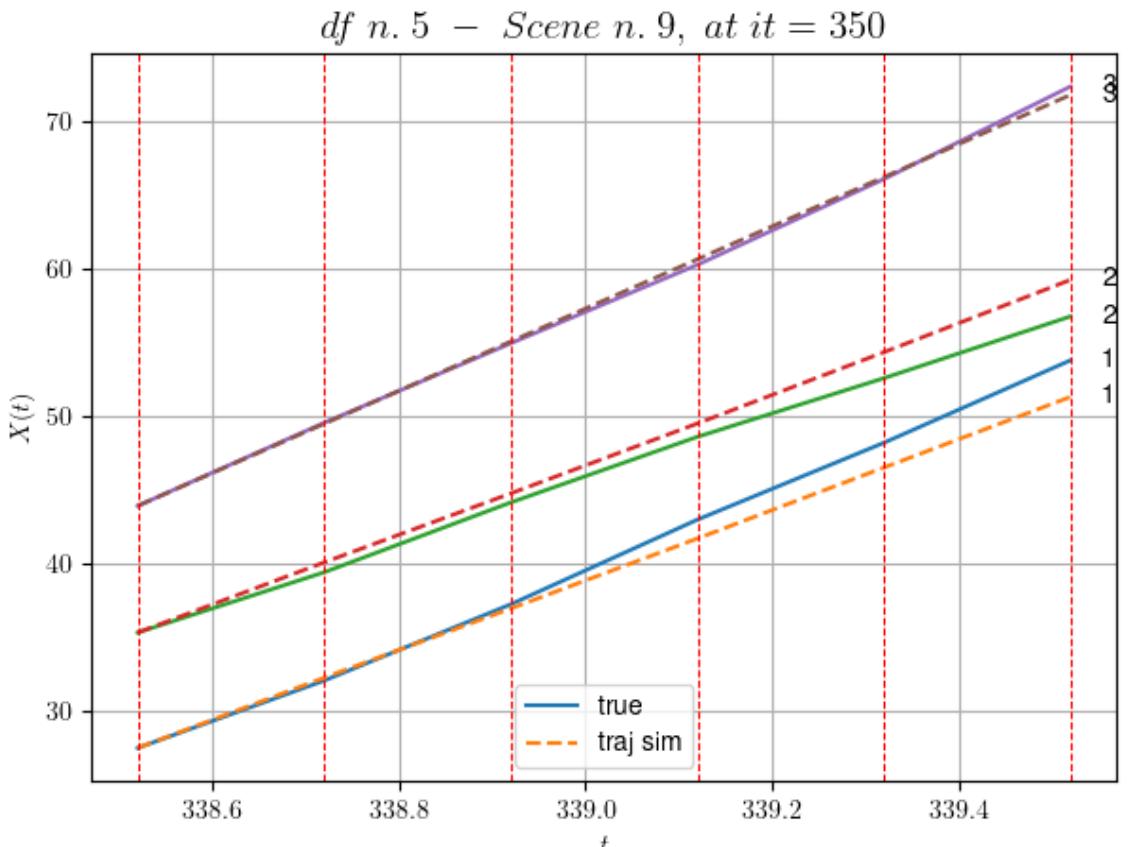
-----  

      * err= 1.2284829679812204  

      * Learning rate NN = 0.0001937102060765028  

      * diff = 0.0006782244640310964

```



For scene 9/14  
 \* use LR\_NN=0.0005 with err=12.00492648538693 at it=19  
 \* v0\_scn\_mean = 28.037876036995254  
 \* MAE = 0.5855896518797474

```
- Time interval n.0: [435.72, 435.92]
  * y_true: [16.6003121 32.10080247]
  * v_ann: [24.2511043548584, 19.755090713500977, 23.
002320042478406]

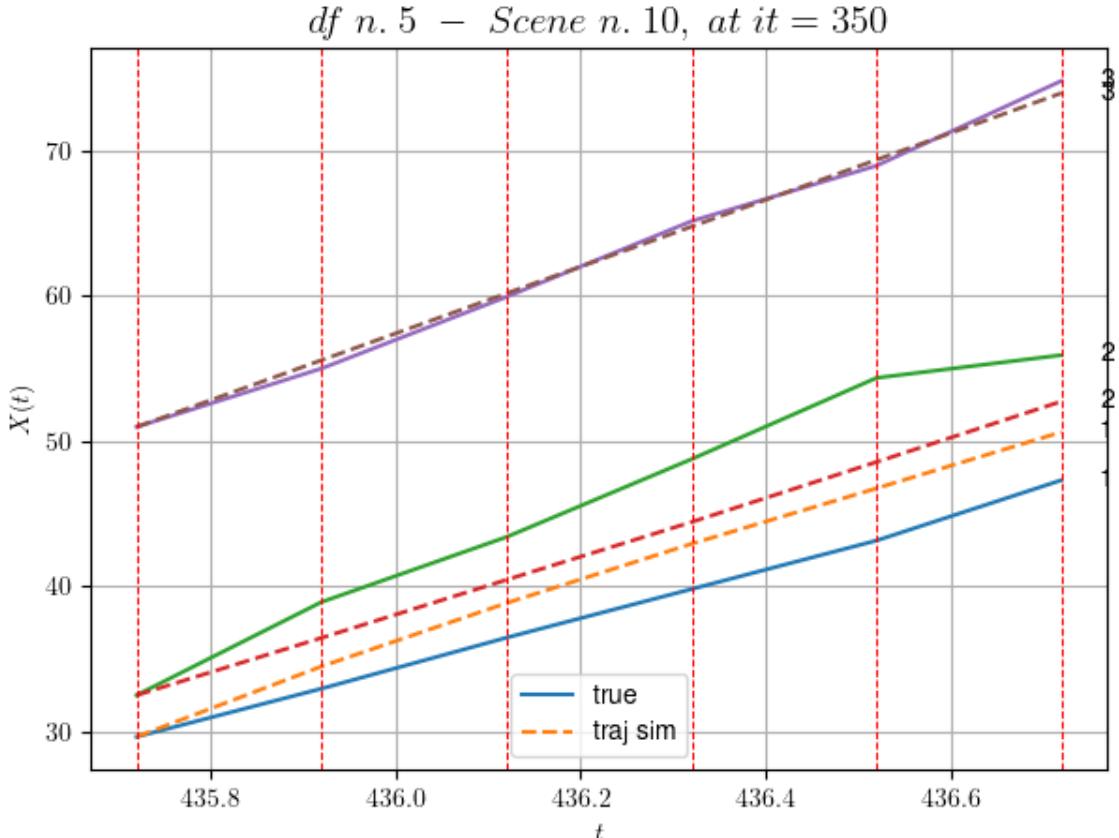
-----
- Time interval n.1: [435.92, 436.12]
  * y_true: [17.55040576 22.4007406 ]
  * v_ann: [21.81426429748535, 20.000699996948242, 2
3.002320042478406]

-----
- Time interval n.2: [436.12, 436.32]
  * y_true: [16.72550921 26.8011085 ]
  * v_ann: [20.403579711914062, 19.885162353515625, 2
3.002320042478406]

-----
- Time interval n.3: [436.32, 436.52]
  * y_true: [16.72550921 28.00144696]
  * v_ann: [19.12784194946289, 20.69528579711914, 23.
002320042478406]

-----
- Time interval n.4: [436.52, 436.72]
  * y_true: [20.80081615 7.85046318]
  * v_ann: [19.385730743408203, 20.8851375579834, 23.
002320042478406]

-----
* err= 6.687520195432334
* Learning rate NN = 0.0003874204121530056
* diff = 0.011017175199276252
```



For scene 10/14

\* use LR\_NN=0.001 with err=12.921807129471373 at it=19  
 \* v0\_scn\_mean = 23.602070447824968  
 \* MAE = 6.687520195432334

---



---

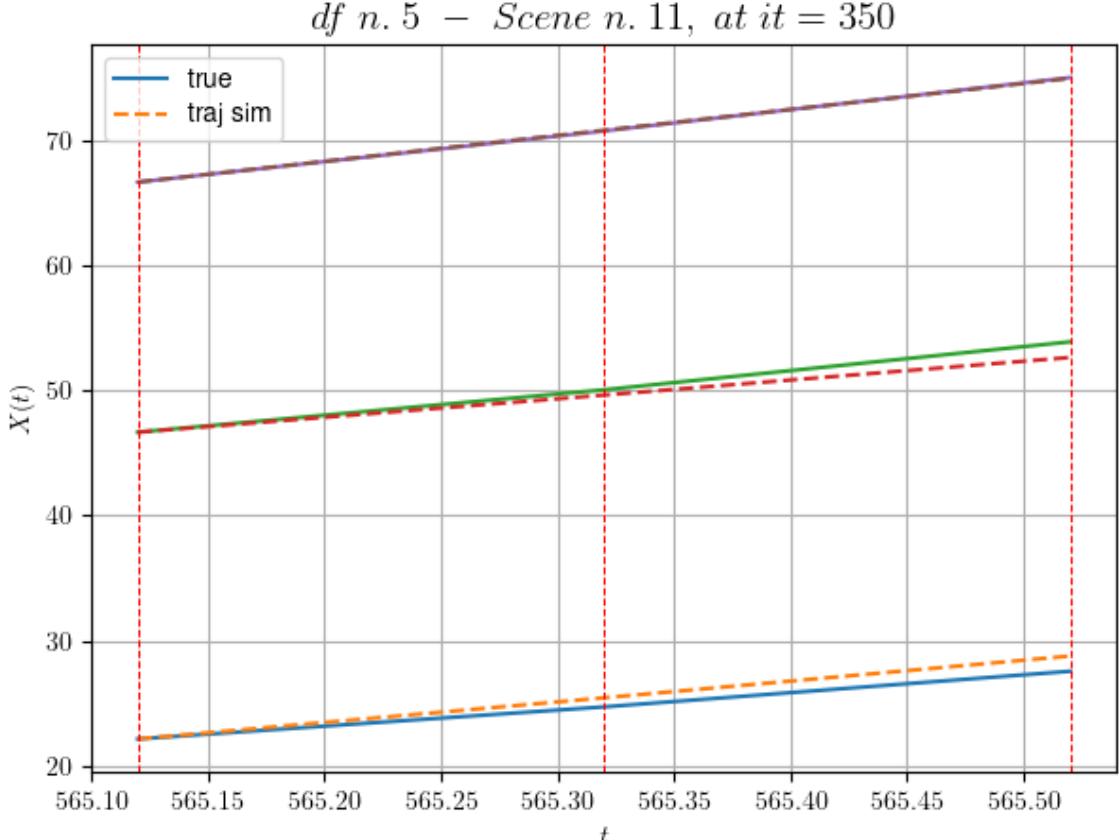
- Time interval n.0: [565.12, 565.32]  
 \* y\_true: [12.82514463 16.9507403 ]  
 \* v\_ann: [16.46250343322754, 14.845168113708496, 2  
 0.75038047095175]

---

- Time interval n.1: [565.32, 565.52]  
 \* y\_true: [14.2510345 19.19106683]  
 \* v\_ann: [16.698823928833008, 15.042547225952148, 2  
 0.75038047095175]

---

\* err= 0.41779078604014447  
 \* Learning rate NN = 3.6449993785936385e-05  
 \* diff = 8.368805308567318e-05



For scene 11/14

- \* use LR\_NN=5e-05 with err=2.5116707741660513 at it=19
- \* v0\_scn\_mean = 21.5431379413596
- \* MAE = 0.41779078604014447

---



---

- Time interval n.0: [578.92, 579.12]
- \* y\_true: [17.01001565 16.52033104]
- \* v\_ann: [16.75284767150879, 16.45921516418457, 20.916676982793472]

---



---

- Time interval n.1: [579.12, 579.32]
- \* y\_true: [16.33004654 15.70042243]
- \* v\_ann: [16.728771209716797, 16.682992935180664, 20.916676982793472]

---



---

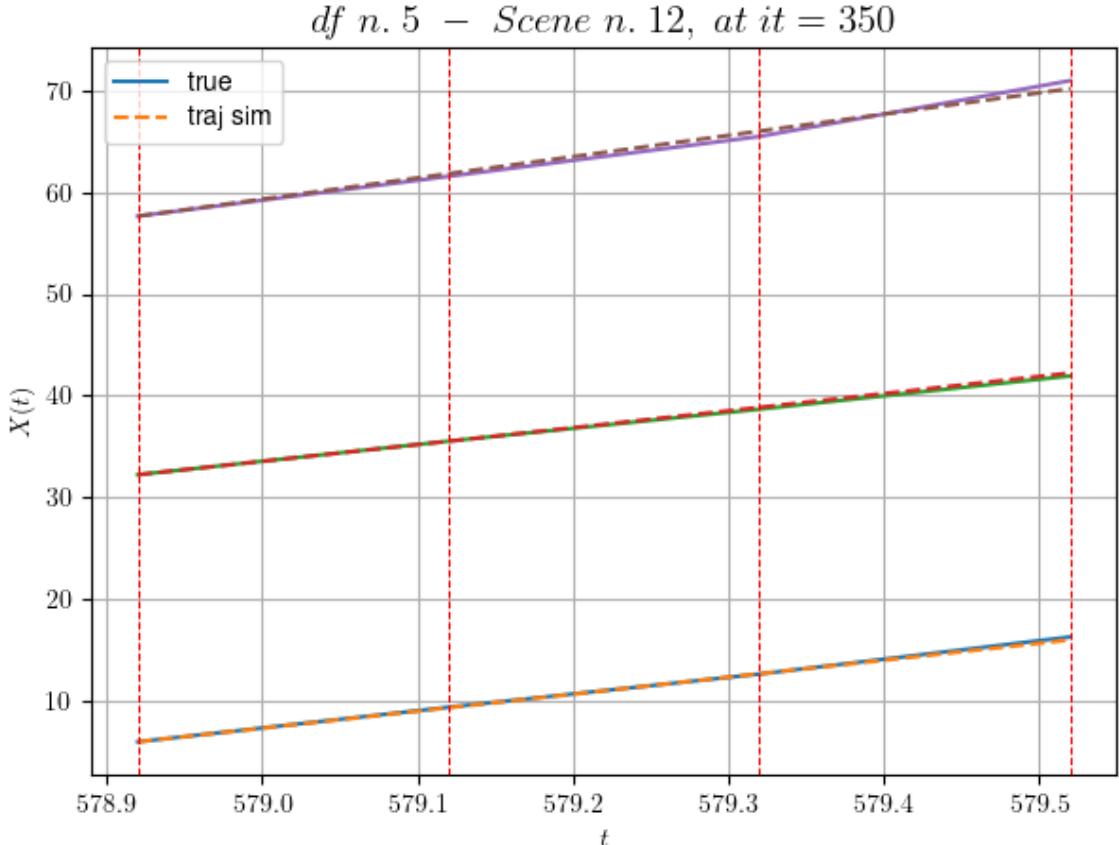
- Time interval n.2: [579.32, 579.52]
- \* y\_true: [18.25006509 16.3654818 ]
- \* v\_ann: [16.6406192779541, 16.91181182861328, 20.916676982793472]

---



---

- \* err= 0.09829902371720334
- \* Learning rate NN = 2.952449540316593e-05
- \* diff = 8.097305350257544e-07



For scene 12/14

```
* use LR_NN=5e-05 with err=3.6285812661353627 at it=19
* v0_scn_mean = 21.695181672139338
* MAE = 0.0917513332052306
```

---



---

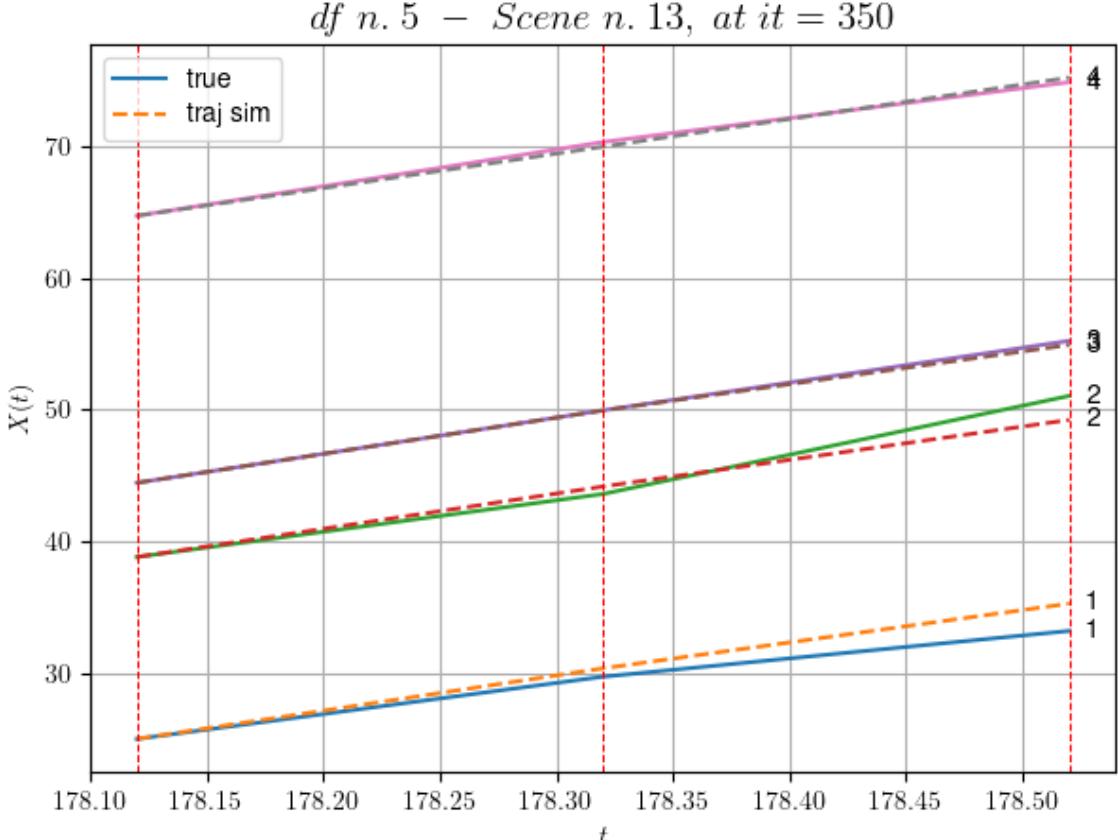
```
- Time interval n.0: [178.12, 178.32]
  * y_true: [23.59034379 23.87574209 27.4762805 ]
  * v_ann: [26.75554847717285, 26.7180233001709, 27.4
29752349853516, 26.19290338460745]
```

---

```
- Time interval n.1: [178.32, 178.52]
  * y_true: [17.35034213 37.1766426 26.34131635]
  * v_ann: [24.54572105407715, 25.24749183654785, 24.
840229034423828, 26.19290338460745]
```

---

```
* err= 0.7222501865468377
* Learning rate NN = 0.0007289999630302191
* diff = 0.00029861119553042936
```



For scene 13/14

```
* use LR_NN=0.001 with err=6.8230441001023285 at it=19  
* v0_scn_mean = 26.627448031028337  
* MAF = 0.48295744998399603
```

For df=5 with 14 scenes, time taken: 134.77

In df n-6/10 we have 3 scenes

```
-----  
- Time interval n.0: [552.20, 552.40]  
  * y_true: [14.01030513 13.18063102]  
  * v_ann: [18.208044052124023, 18.0156192779541, 20.  
233275612773262]
```

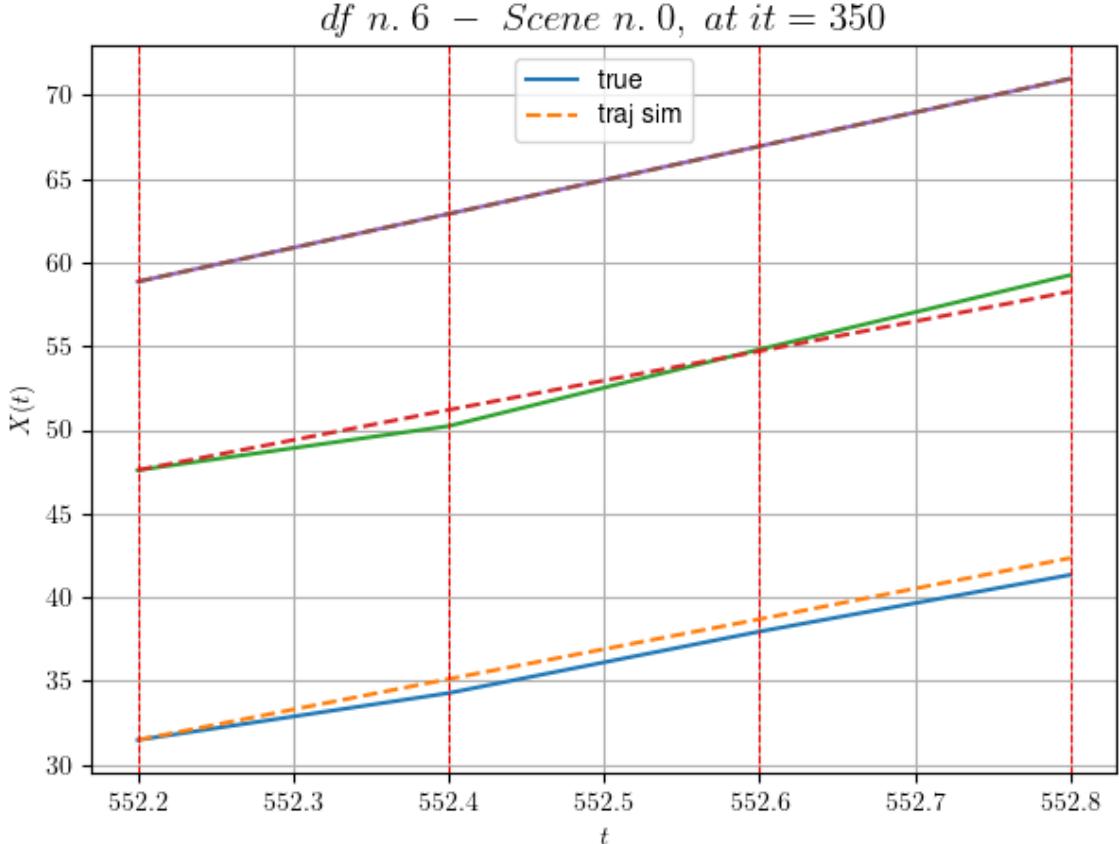
```
- Time interval n.1: [552.40, 552.60]
  * y_true: [18.39048446 22.9012939 ]
  * v_ann: [17.88297462463379, 17.558073043823242, 2
```

- Time interval n.2: [552.60, 552.80]

```
* y_true: [16.95052919 22.22132939]
* v_ann: [18.289892196655273, 17.7816162109375, 20.
233275612773262]
```

---

```
* err= 0.3488585989690454
* Learning rate NN = 5.904899080633186e-05
* diff = 0.0015314354870202274
```



For scene 0/3

```
* use LR_NN=0.0001 with err=5.925348036150773 at it=19
* v0_scn_mean = 21.07035260767802
* MAE = 0.2860565618900582
```

---



---

```
- Time interval n.0: [553.00, 553.20]
* y_true: [23.0804555 19.17546127 18.9008181 ]
* v_ann: [19.285247802734375, 19.13996124267578, 1
9.066560745239258, 23.749701248855523]
```

---



---

```
- Time interval n.1: [553.20, 553.40]
* y_true: [22.02058024 17.45053567 16.85079909]
* v_ann: [19.878257751464844, 19.94245147705078, 2
0.104042053222656, 23.749701248855523]
```

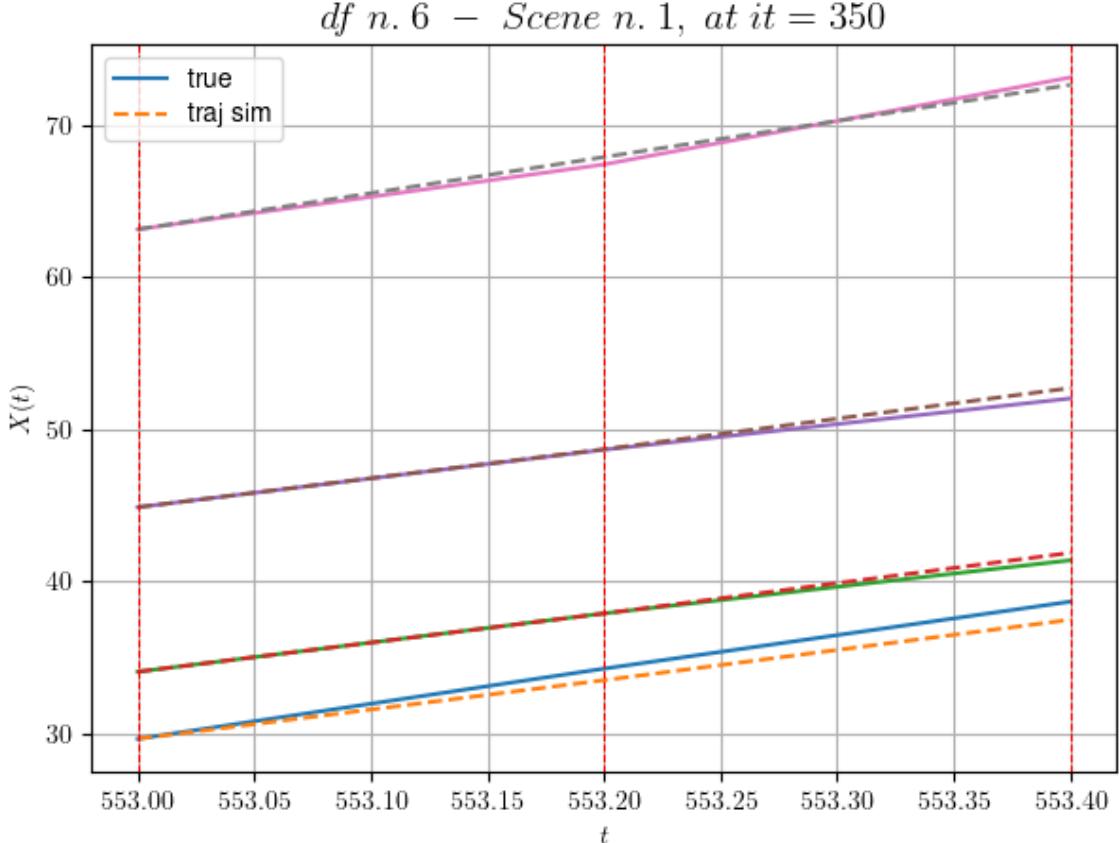
---



---

```
* err= 0.26395560354935166
```

\* Learning rate NN = 0.0007289999630302191  
 \* diff = 5.01856105871723e-05



For scene 1/3

\* use LR\_NN=0.001 with err=5.803754982339184 at it=19  
 \* v0\_scn\_mean = 24.4631146804615  
 \* MAE = 0.2552618316515371

---



---

- Time interval n.0: [554.00, 554.20]  
 \* y\_true: [20.50061186 21.35116733 22.20133365]  
 \* v\_ann: [21.68514060974121, 21.406940460205078, 2  
 2.16995620727539, 23.647953726265474]

---



---

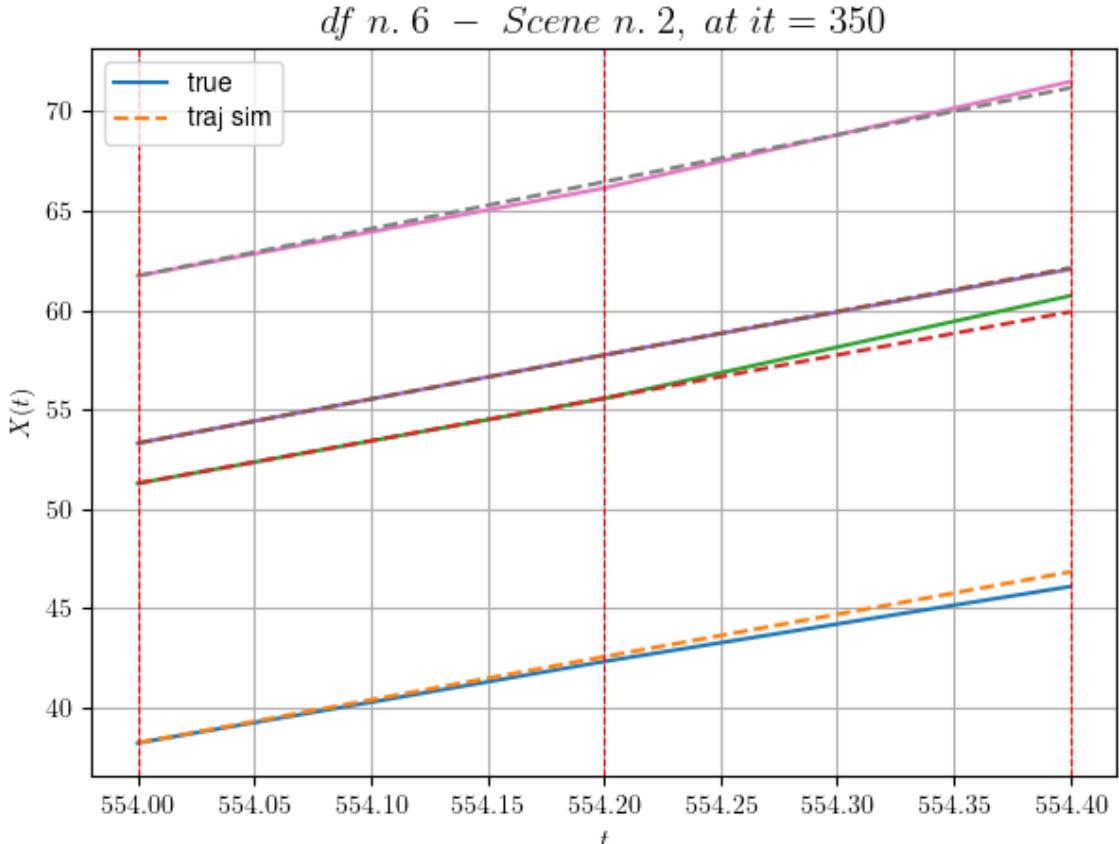
- Time interval n.1: [554.20, 554.40]  
 \* y\_true: [18.86075328 25.85180384 21.5614577 ]  
 \* v\_ann: [21.37557601928711, 21.760608673095703, 2  
 1.929519653320312, 23.647953726265474]

---



---

\* err= 0.12181716433390893  
 \* Learning rate NN = 0.0007289999630302191  
 \* diff = 2.9877136790645853e-05



For scene 2/3

- \* use LR\_NN=0.001 with err=6.31038665712787 at it=19
- \* v0\_scn\_mean = 24.372980690622487
- \* MAE = 0.11973067957541955

---



---

For df=6 with 3 scenes, time taken: 22.85

---



---

In df n.7/10 we have 8 scenes

---



---

- Time interval n.0: [38.56, 38.76]
- \* y\_true: [34.50899027 34.29923068]
- \* v\_ann: [31.24941635131836, 32.23870849609375, 28.99001788809881]

---



---

- Time interval n.1: [38.76, 38.96]
- \* y\_true: [33.76780394 27.40980382]
- \* v\_ann: [32.77904510498047, 33.640106201171875, 28.99001788809881]

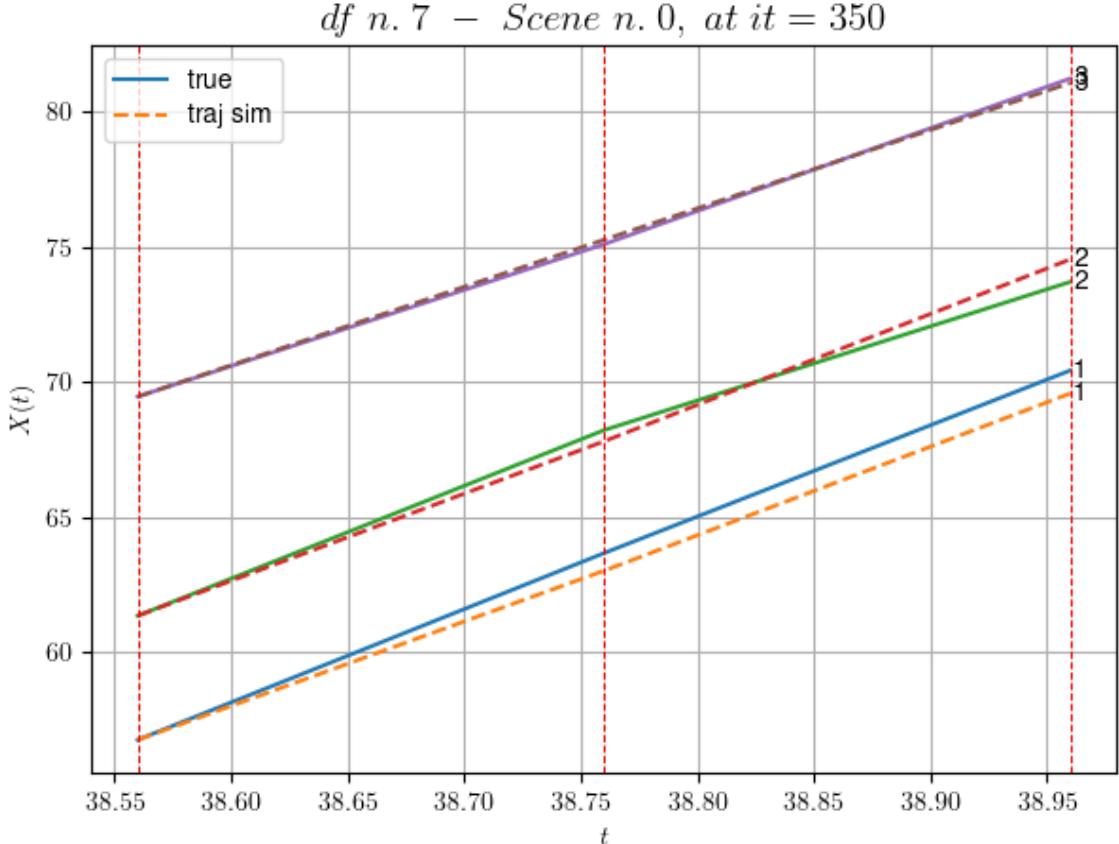
---



---

\* err= 0.22966919219950624

\* Learning rate NN = 0.0007289999630302191  
 \* diff = 5.490620928527701e-05



For scene 0/8

\* use LR\_NN=0.001 with err=3.24305095416837 at it=19  
 \* v0\_scn\_mean = 29.076580460934775  
 \* MAE = 0.22966919219950624

---



---

- Time interval n.0: [39.76, 39.96]
    - \* y\_true: [22.5368218 26.50901133]
    - \* v\_ann: [27.538211822509766, 27.065021514892578, 28.62976262255397]

---

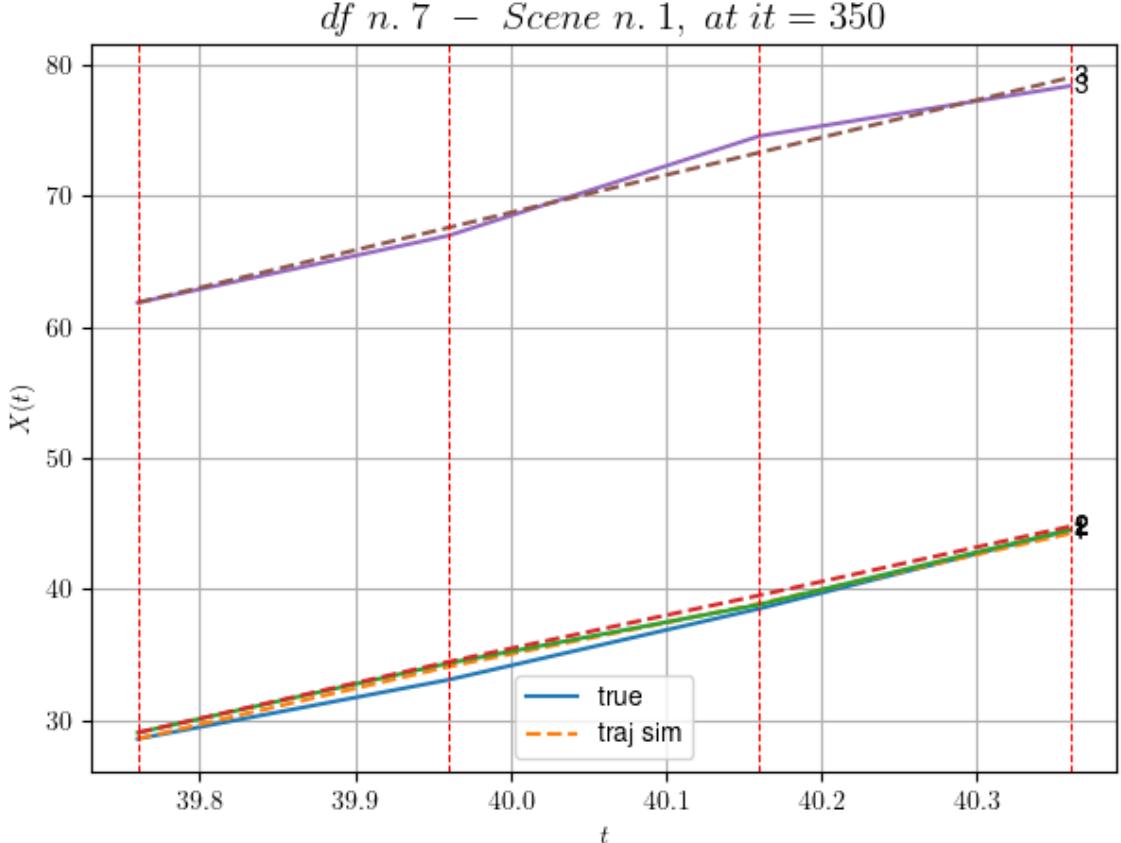
  - Time interval n.1: [39.96, 40.16]
    - \* y\_true: [27.13488394 22.34107329]
    - \* v\_ann: [24.010337829589844, 25.324129104614258, 28.62976262255397]

---

  - Time interval n.2: [40.16, 40.36]
    - \* y\_true: [29.97962766 28.56631616]
    - \* v\_ann: [26.817909240722656, 26.303613662719727, 28.62976262255397]

---
- \* err= 0.34644118580206346

\* Learning rate NN = 0.0002952449722215533  
 \* diff = 0.00029844164369513537



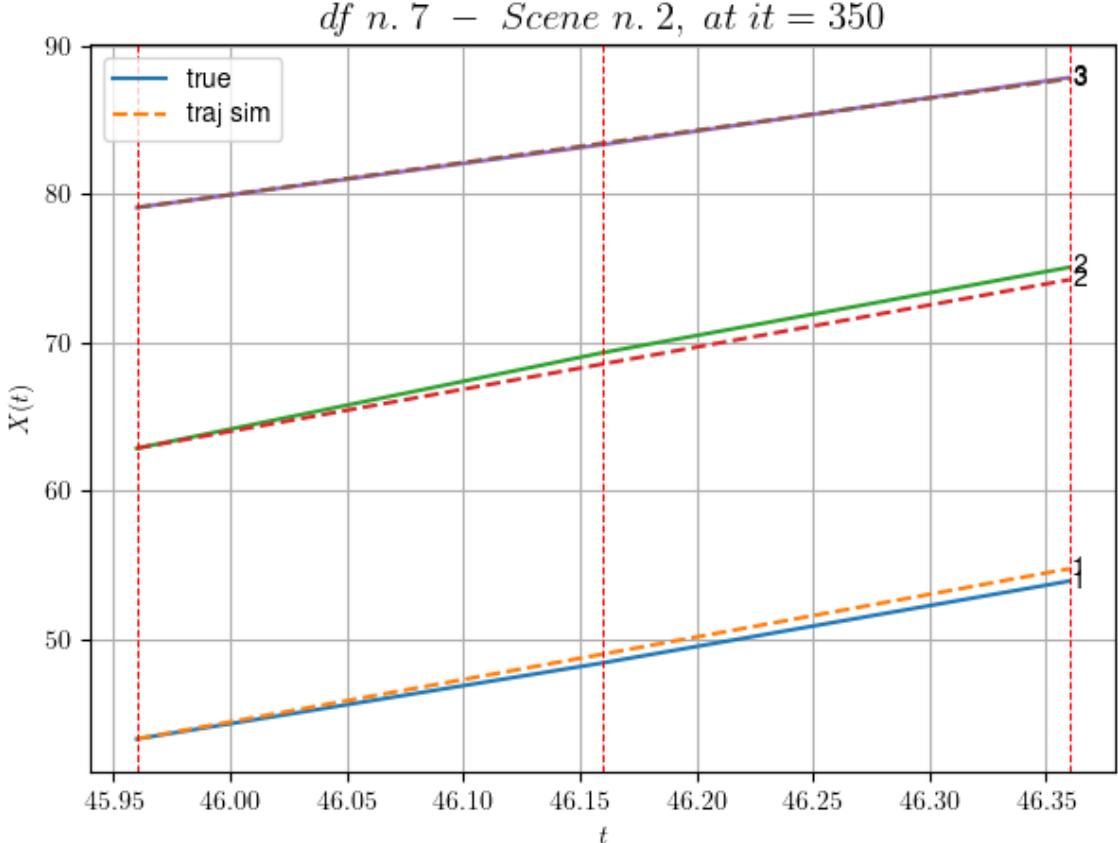
For scene 1/8

\* use LR\_NN=0.0005 with err=18.10299812589289 at it=19  
 \* v0\_scn\_mean = 28.747201606264685  
 \* MAE = 0.34644118580206346

- Time interval n.0: [45.96, 46.16]  
 \* y\_true: [25.63954073 32.24792255]  
 \* v\_ann: [28.60422134399414, 28.4270076751709, 21.6  
 7942641957732]

- Time interval n.1: [46.16, 46.36]  
 \* y\_true: [27.5623729 28.76269973]  
 \* v\_ann: [28.763835906982422, 28.383955001831055, 2  
 1.67942641957732]

\* err= 0.2613602733417504  
 \* Learning rate NN = 3.6449993785936385e-05  
 \* diff = 9.845899653854184e-05



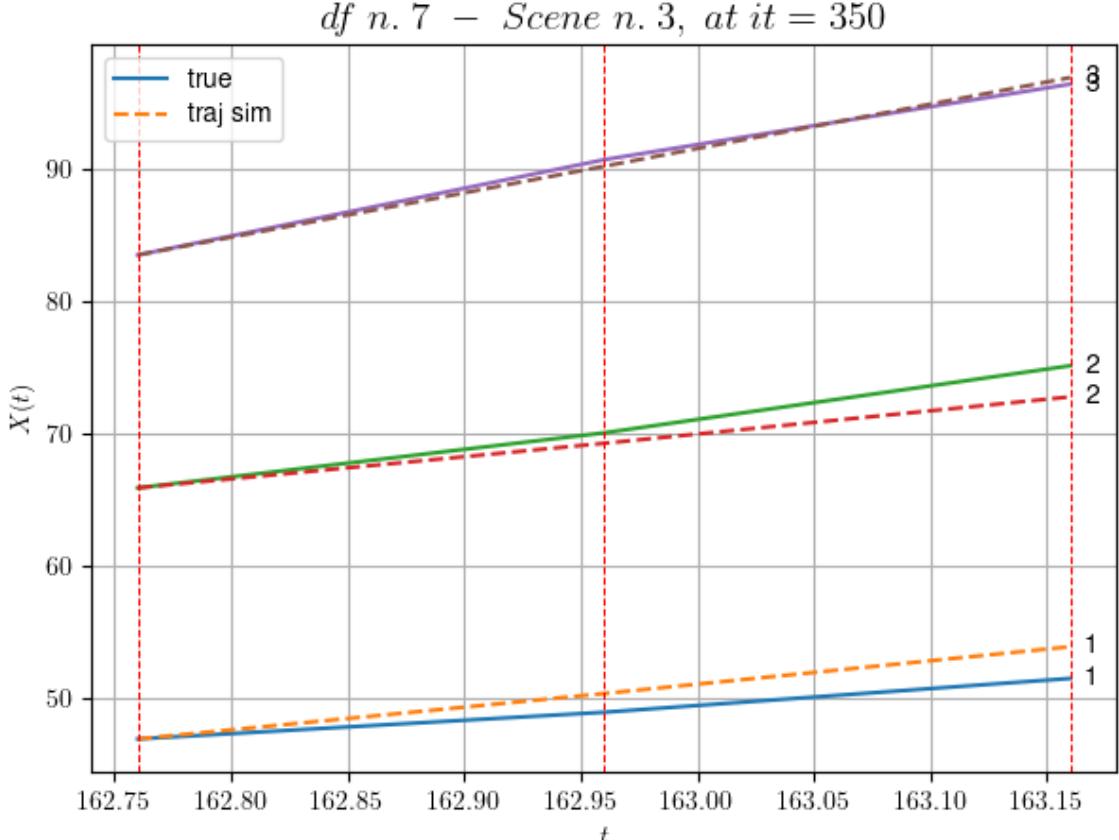
For scene 2/8

```
* use LR_NN=5e-05 with err=3.061051667925526 at it=19  
* v0_scn_mean = 22.392558115777916  
* MAF = 0.2613602733417504
```

```
- Time interval n.0: [162.76, 162.96]
  * y_true: [10.08699654 20.77195672]
  * v_ann: [17.161819458007812, 16.828229904174805, 3
3.51452922086696]
```

```
- Time interval n.1: [162.96, 163.16]
  * y_true: [12.77745535 25.37230132]
  * v_ann: [17.68958854675293, 17.55310821533203, 33.
51452922086696]
```

```
* err= 1.5997889791262905
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.0003640188458149396
```



For scene 3/8

```
* use LR_NN=5e-05 with err=1.9442547838297772 at it=19
* v0_scn_mean = 33.21330933976166
* MAE = 1.5522382713887168
```

---



---

```
- Time interval n.0: [165.76, 165.96]
  * y_true: [14.62535373 14.97522028]
  * v_ann: [14.13449764251709, 15.865386009216309, 2
7.26222960772804]
```

---

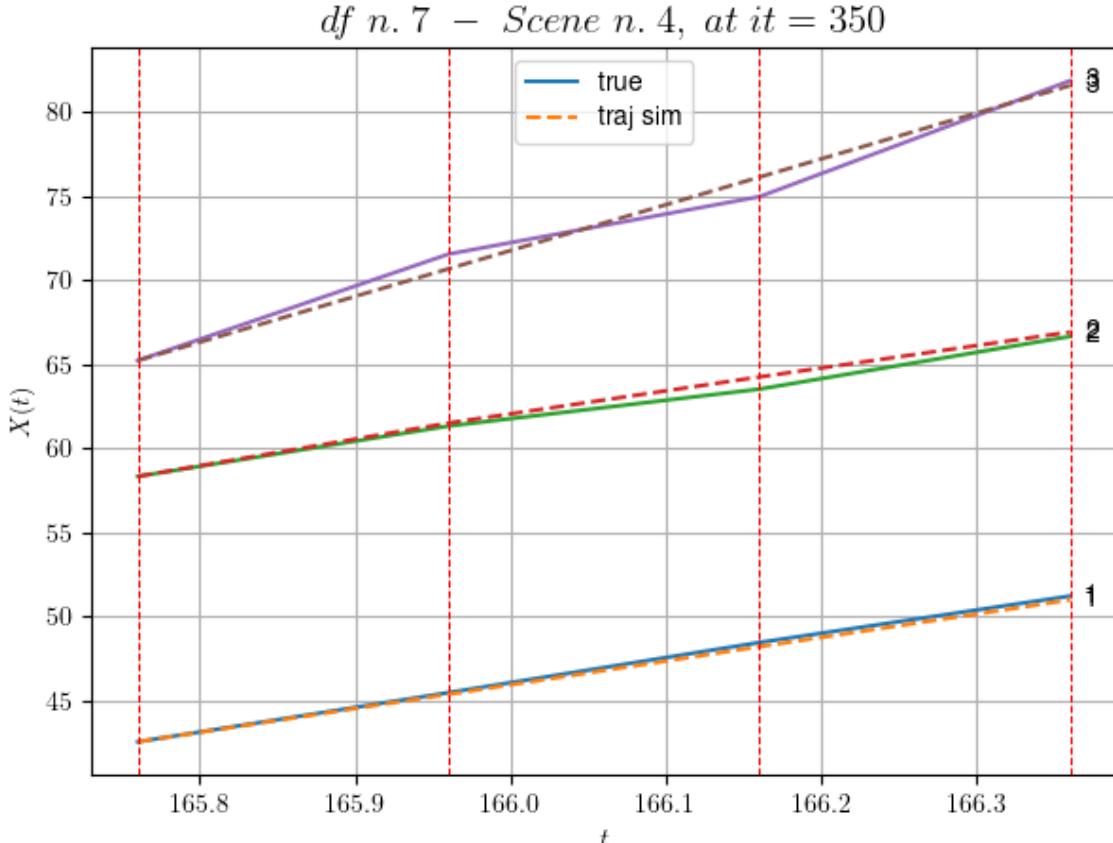
```
- Time interval n.1: [165.96, 166.16]
  * y_true: [14.90483904 10.97892299]
  * v_ann: [14.152209281921387, 13.704748153686523, 2
7.26222960772804]
```

---

```
- Time interval n.2: [166.16, 166.36]
  * y_true: [13.82116599 15.66867879]
  * v_ann: [13.911394119262695, 13.362330436706543, 2
7.26222960772804]
```

---

```
* err= 0.24596843815636063
* Learning rate NN = 2.952449540316593e-05
* diff = 0.0013086927493776712
```



For scene 4/8

```
* use LR_NN=5e-05 with err=1.4210452357691643 at it=19
* v0_scn_mean = 27.49687579224644
* MAE = 0.24596843815636063
```

---



---

```
- Time interval n.0: [188.16, 188.36]
  * y_true: [18.26365072 21.2472937 ]
  * v_ann: [19.849817276000977, 21.61836814880371, 2
4.898645104742123]
```

---

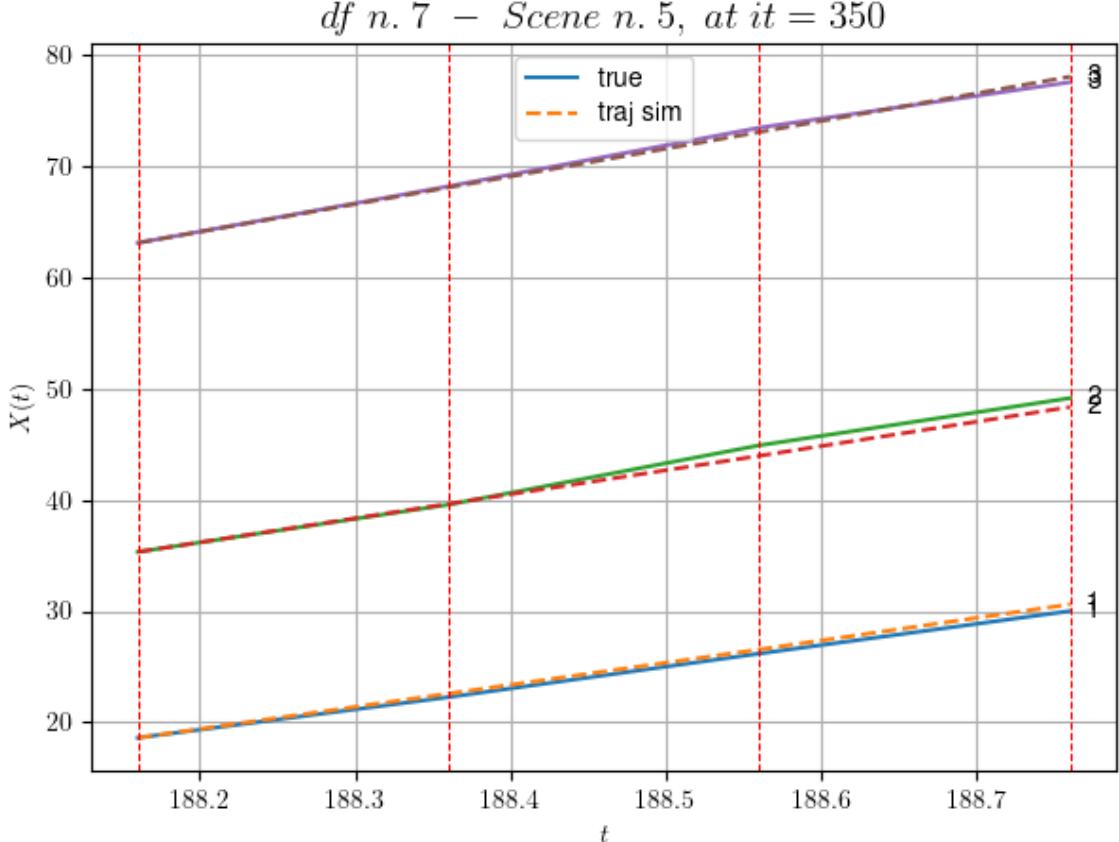
```
- Time interval n.1: [188.36, 188.56]
  * y_true: [19.58083161 26.63811802]
  * v_ann: [19.823213577270508, 21.57021141052246, 2
4.898645104742123]
```

---

```
- Time interval n.2: [188.56, 188.76]
  * y_true: [19.1135942 21.22632097]
  * v_ann: [20.295940399169922, 21.91924476623535, 2
4.898645104742123]
```

---

```
* err= 0.21158510803555478
* Learning rate NN = 5.904899080633186e-05
* diff = 0.004502735398342367
```



For scene 5/8

- \* use LR\_NN=0.0001 with err=2.1535277138761075 at it=19
- \* v0\_scn\_mean = 25.335867110438656
- \* MAE = 0.09280523825805093

---



---

For scene 6/8

- \* use LR\_NN=0.0005 with err=3.0373835787740933 at it=19
- \* v0\_scn\_mean = 26.933635352173287
- \* MAE = 0.18709051499965393

---



---

- Time interval n.0: [166.56, 166.76]
  - \* y\_true: [17.24164345 15.73752306 15.58083022]
  - \* v\_ann: [18.100929260253906, 17.669572830200195, 17.36299705505371, 17.37043158542252]

---

- Time interval n.1: [166.76, 166.96]
  - \* y\_true: [18.38470966 27.72552812 9.3330177 ]
  - \* v\_ann: [17.386707305908203, 17.379087448120117, 16.933536529541016, 17.37043158542252]

---

- Time interval n.2: [166.96, 167.16]

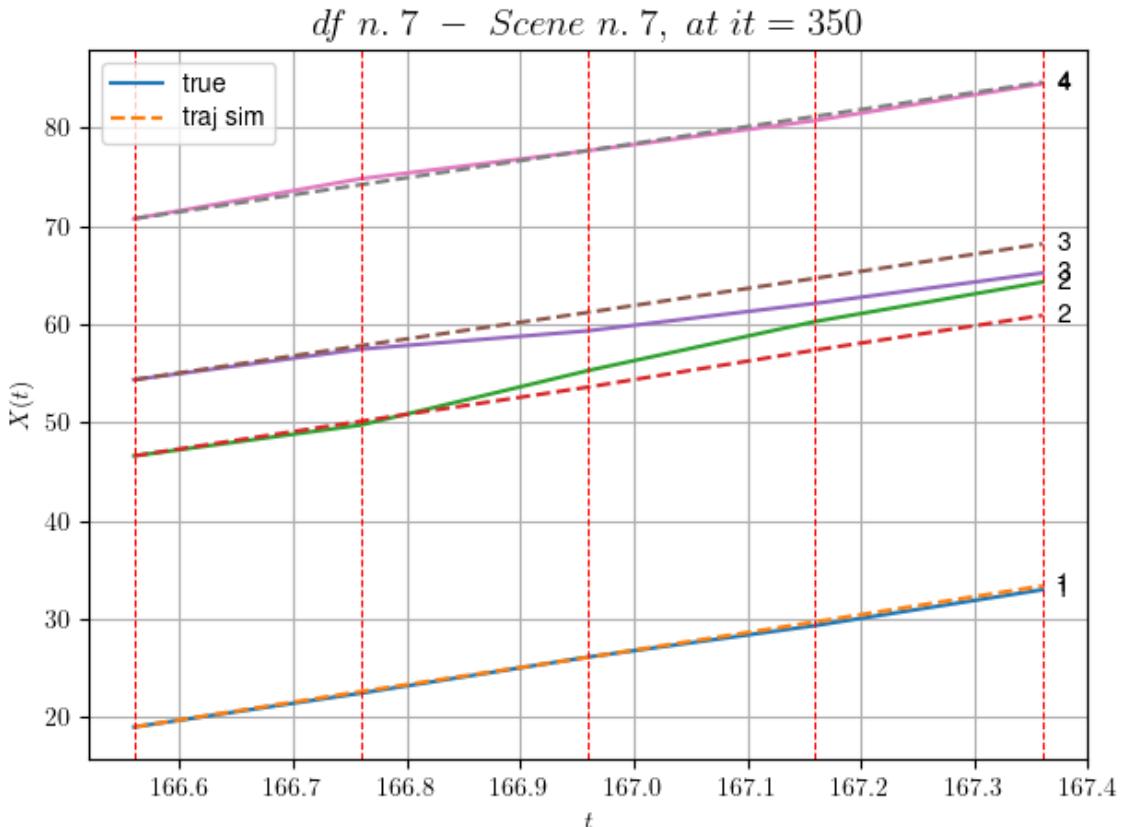
```

* y_true: [16.02323775 24.97208403 13.98221987]
* v_ann: [18.041549682617188, 18.835796356201172, 1
7.37819480895996, 17.37043158542252]

-----
- Time interval n.3: [167.16, 167.36]
* y_true: [18.26534189 20.06151439 15.46259314]
* v_ann: [18.350685119628906, 17.65642547607422, 1
7.52411460876465, 17.37043158542252]

-----
* err= 2.1416504340554456
* Learning rate NN = 0.000239148415857926
* diff = 0.0029577726237688395

```



For scene 7/8

```

* use LR_NN=0.0005 with err=25.773126175917593 at it=19
* v0_scn_mean = 18.81197927795333
* MAE = 2.0258473587960286

```

---



---

For df=7 with 8 scenes, time taken: 67.32

---



---



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---



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---



---

In df n.8/10 we have 21 scenes

---



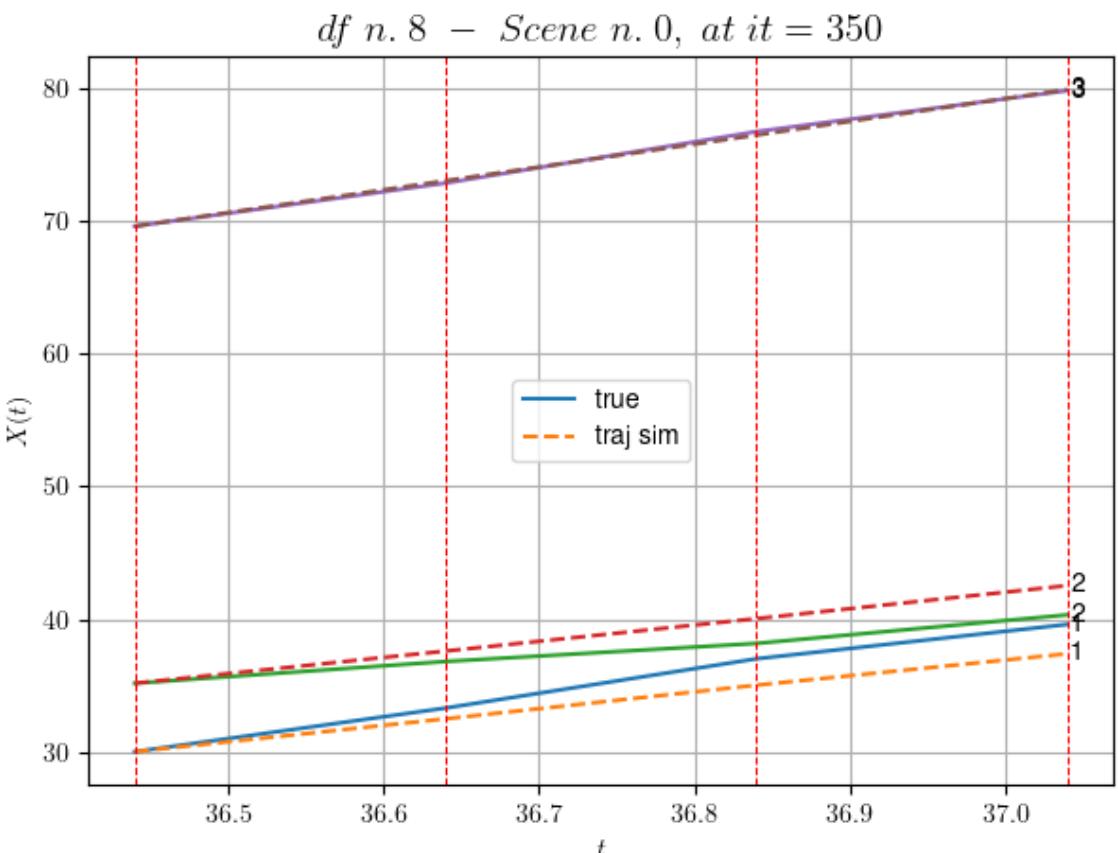
---

```
*****
- Time interval n.0: [36.44, 36.64]
  * y_true: [16.4303266 8.20020738]
  * v_ann: [12.385797500610352, 12.126097679138184, 1
  7.15688873745732]

-----
- Time interval n.1: [36.64, 36.84]
  * y_true: [18.55044671 6.80018642]
  * v_ann: [12.662435531616211, 12.212176322937012, 1
  7.15688873745732]

-----
- Time interval n.2: [36.84, 37.04]
  * y_true: [12.9262384 10.75446129]
  * v_ann: [11.828932762145996, 12.433565139770508, 1
  7.15688873745732]

* err= 1.5448920012747884
* Learning rate NN = 0.0002952449722215533
* diff = 8.709859257960417e-05
```



For scene 0/21

\* use LR\_NN=0.0005 with err=14.873301462587705 at it=19  
 \* v0\_scn\_mean = 18.257633731852916  
 \* MAE = 1.5320422661111157

```

    - Time interval n.0: [50.24, 50.44]
      * y_true: [14.83043604 14.50055453]
      * v_ann: [19.946292877197266, 20.113323211669922, 3
      0.1576598348791]

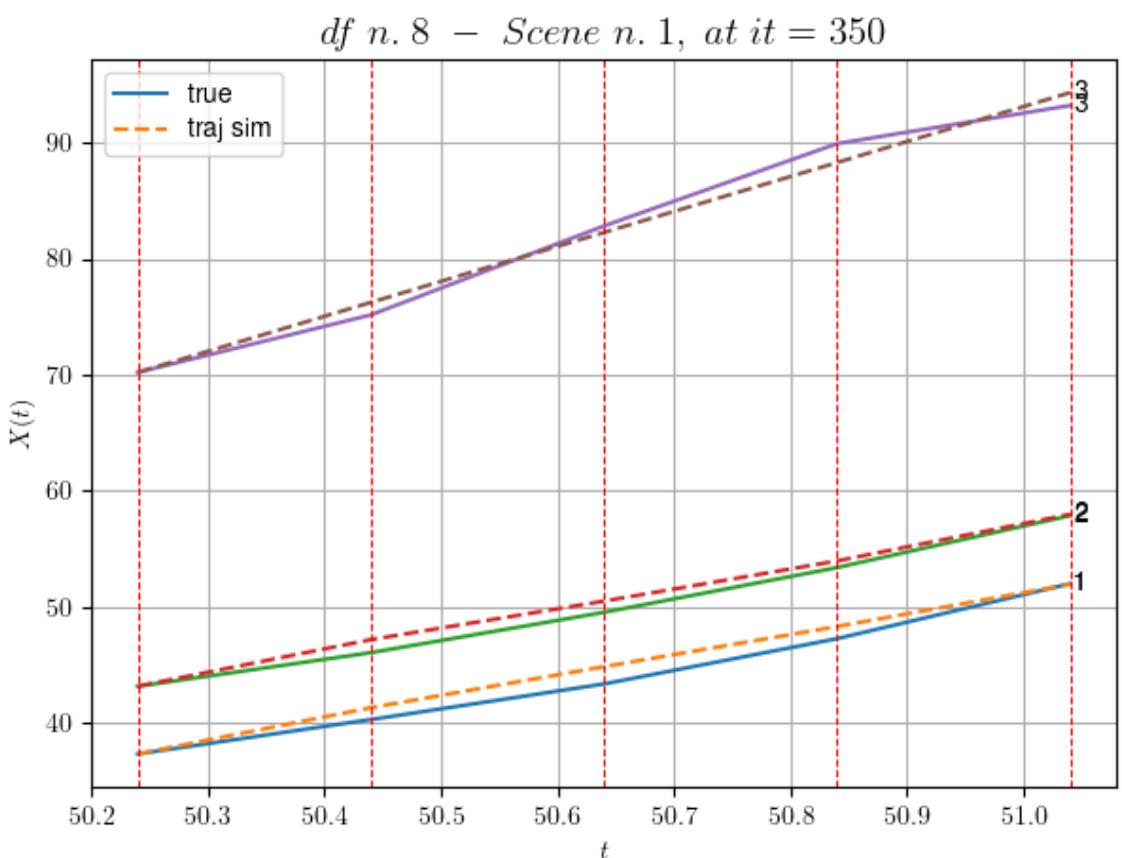
-----
    - Time interval n.1: [50.44, 50.64]
      * y_true: [15.35052738 17.38080918]
      * v_ann: [17.69685935974121, 16.60101890563965, 30.
      1576598348791]

-----
    - Time interval n.2: [50.64, 50.84]
      * y_true: [19.54078826 19.30097894]
      * v_ann: [17.30260467529297, 17.339954376220703, 3
      0.1576598348791]

-----
    - Time interval n.3: [50.84, 51.04]
      * y_true: [23.72114006 22.40641196]
      * v_ann: [18.20306968688965, 20.115398406982422, 3
      0.1576598348791]

-----
      * err= 0.8181652055582576
      * Learning rate NN = 0.000478296831715852
      * diff = 0.00011343096849847356

```



For scene 1/21

\* use LR\_NN=0.001 with err=9.566857443230928 at it=19

\* v0\_scn\_mean = 30.144147277795906

\* MAE = 0.7492089030928488

=====

=====

- Time interval n.0: [102.24, 102.44]

\* y\_true: [22.78095819 15.94092959]

\* v\_ann: [18.264596939086914, 18.660449981689453, 3  
1.348282240790297]

-----

-----

- Time interval n.1: [102.44, 102.64]

\* y\_true: [23.36120187 12.10080168]

\* v\_ann: [19.15471649169922, 20.858905792236328, 3  
1.348282240790297]

-----

-----

- Time interval n.2: [102.64, 102.84]

\* y\_true: [20.51121756 22.37162153]

\* v\_ann: [21.714200973510742, 20.316410064697266, 3  
1.348282240790297]

-----

-----

- Time interval n.3: [102.84, 103.04]

\* y\_true: [23.62167761 20.76175162]

\* v\_ann: [21.194856643676758, 21.188743591308594, 3  
1.348282240790297]

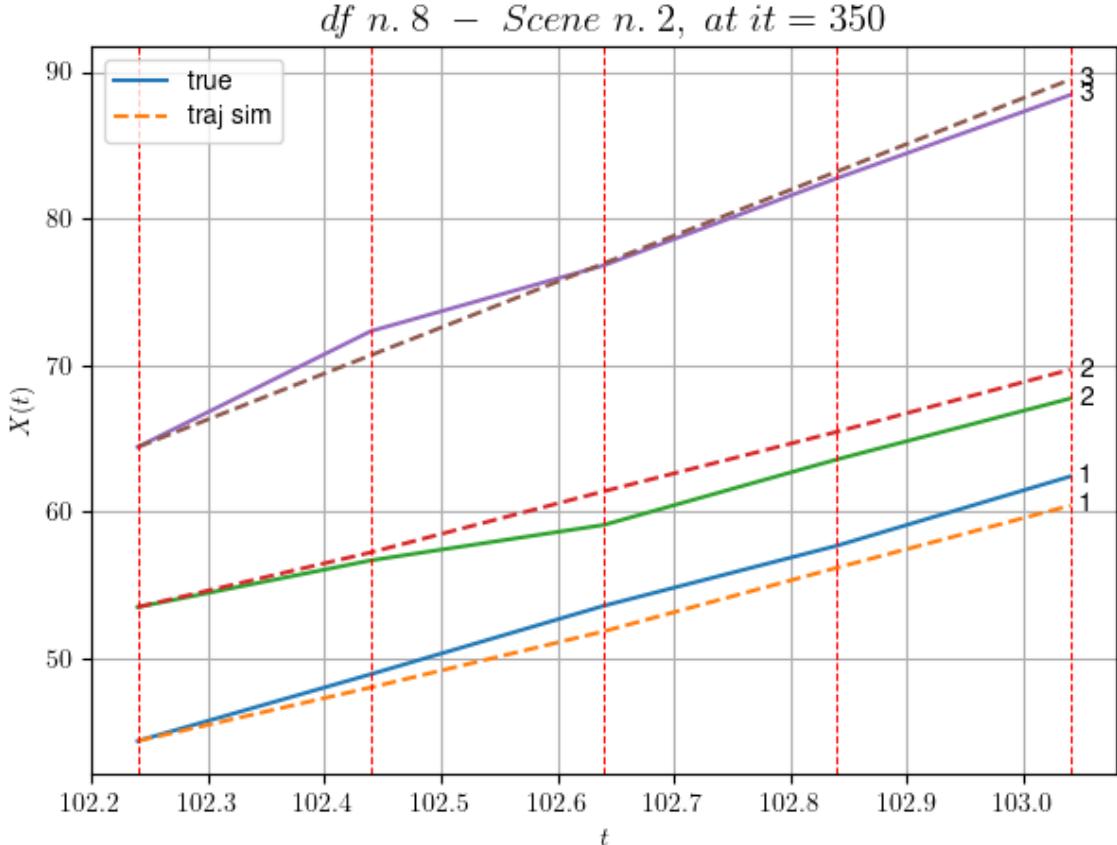
-----

-----

\* err= 1.806047427714944

\* Learning rate NN = 0.000478296831715852

\* diff = 0.0008999740011921276



For scene 2/21

- \* use LR\_NN=0.001 with err=11.002831099039271 at it=19
- \* v0\_scn\_mean = 31.232724966758738
- \* MAE = 1.2580224023120608

---



---

- Time interval n.0: [108.84, 109.04]
- \* y\_true: [17.9810803 26.65193678]
- \* v\_ann: [22.05014991760254, 21.08896255493164, 20.

54908340384348]

---

- Time interval n.1: [109.04, 109.24]
- \* y\_true: [14.30252156 22.9019425 ]
- \* v\_ann: [20.22649574279785, 21.37606430053711, 20.

54908340384348]

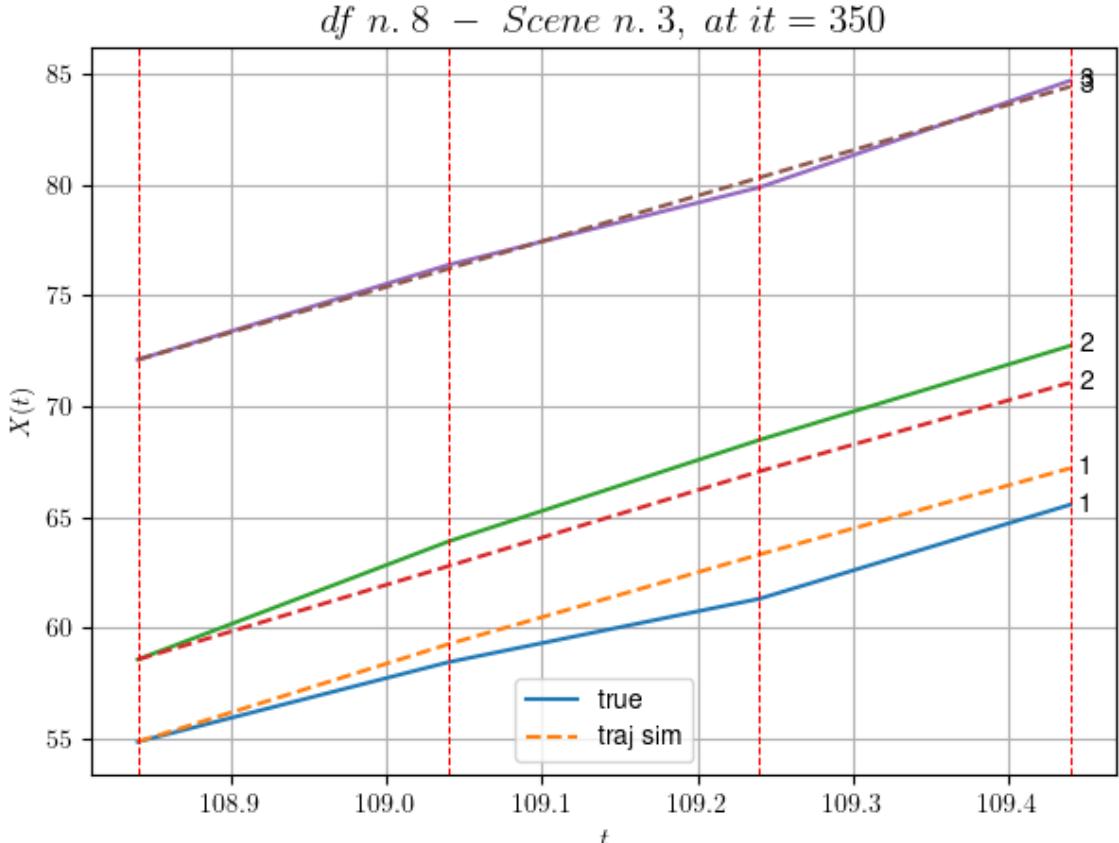
---

- Time interval n.2: [109.24, 109.44]
- \* y\_true: [21.24158827 21.25204953]
- \* v\_ann: [19.47557830810547, 20.02023696899414, 20.

54908340384348]

---

- \* err= 1.139774624185506
- \* Learning rate NN = 0.0005904899444431067
- \* diff = 0.0001814403019921862



For scene 3/21

```
* use LR_NN=0.001 with err=5.399769519318025 at it=19
* v0_scn_mean = 21.359093449151526
* MAE = 1.0367564231586759
```

---



---

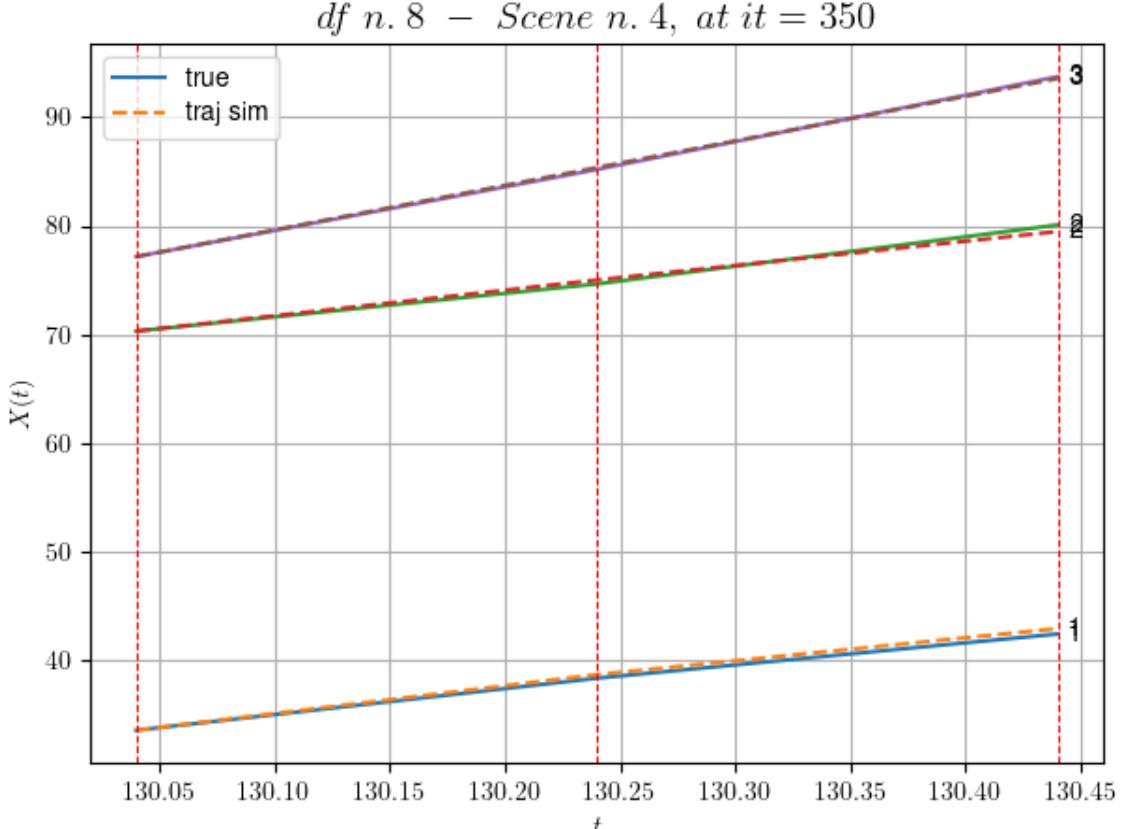
```
- Time interval n.0: [130.04, 130.24]
  * y_true: [23.9806113 21.72216875]
  * v_ann: [25.634000778198242, 23.5542049407959, 41.
055542418781656]
```

---

```
- Time interval n.1: [130.24, 130.44]
  * y_true: [20.38064152 27.22317612]
  * v_ann: [21.239551544189453, 22.35450553894043, 4
1.055542418781656]
```

---

```
* err= 0.103310281622623
* Learning rate NN = 0.00036449998151510954
* diff = 0.00010642894015551463
```



For scene 4/21

```
* use LR_NN=0.0005 with err=8.920632085005373 at it=19
* v0_scn_mean = 40.10800465094396
* MAE = 0.103310281622623
```

---



---

```
- Time interval n.0: [215.24, 215.44]
* y_true: [ 1.34614625 10.42531549]
* v_ann: [19.083518981933594, 20.296554565429688, 1
5.100797270465883]
```

---

```
- Time interval n.1: [215.44, 215.64]
* y_true: [18.28906766 10.32533879]
* v_ann: [13.894729614257812, 13.740290641784668, 1
5.100797270465883]
```

---

```
- Time interval n.2: [215.64, 215.84]
* y_true: [29.02100933 15.78058213]
* v_ann: [15.7510986328125, 14.021422386169434, 15.
100797270465883]
```

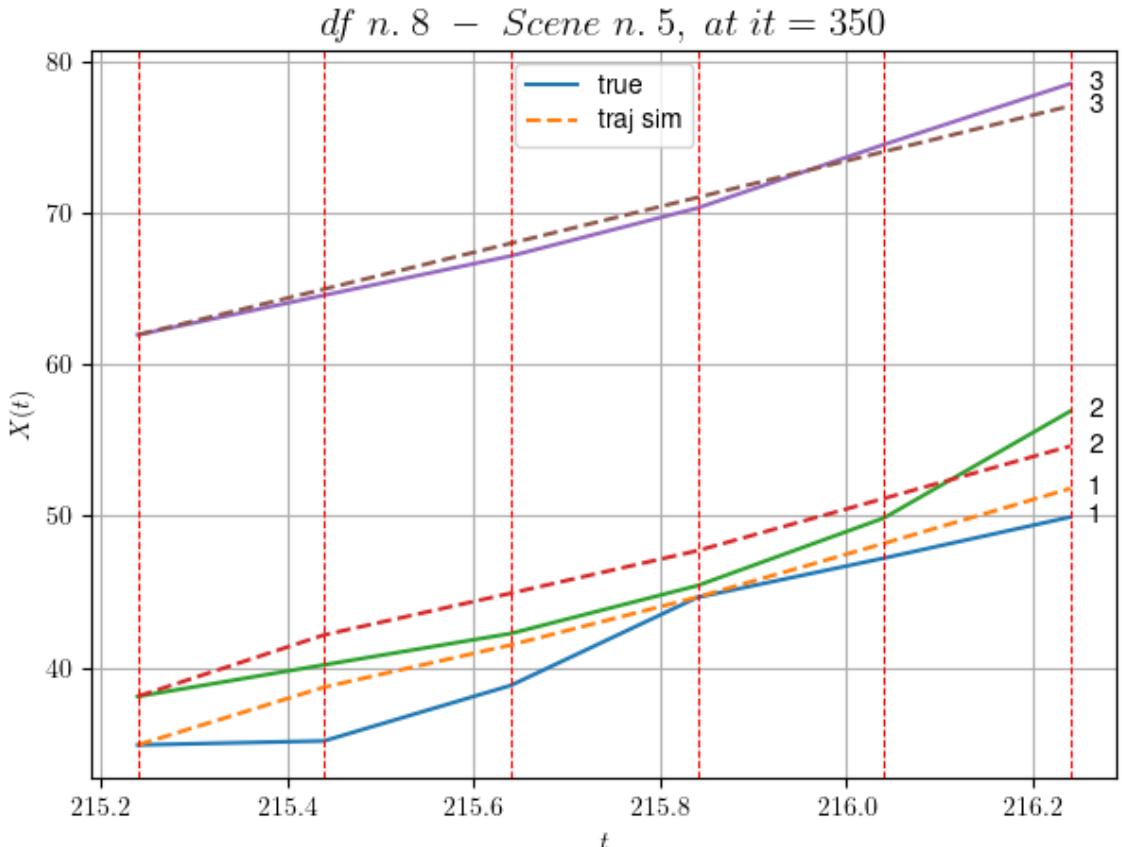
---

```
- Time interval n.3: [215.84, 216.04]
* y_true: [12.95052595 22.3009853 ]
* v_ann: [17.736392974853516, 17.218063354492188, 1
```

5.100797270465883]

```
- Time interval n.4: [216.04, 216.24]
  * y_true: [13.56563519 35.25195514]
  * v_ann: [18.10516929626465, 17.27798080444336, 15.
100797270465883]
```

```
* err= 2.842505439858863
* Learning rate NN = 0.0003874204121530056
* diff = 0.0024953739356283755
```



For scene 5/21

```
* use LR_NN=0.001 with err=38.83544170273042 at it=19
* v0_scn_mean = 16.377763769452063
* MAE = 2.842505439858863
```

```
- Time interval n.0: [222.64, 222.84]
  * y_true: [3.4148313 7.54419185]
  * v_ann: [5.508218765258789, 5.619286060333252, 12.
428665091344943]
```

```
- Time interval n.1: [222.84, 223.04]
  * y_true: [1.34614625 9.61287691]
  * v_ann: [5.34774112701416, 5.6500349044799805, 12.
```

428665091344943]

---

- Time interval n.2: [223.04, 223.24]
  - \* y\_true: [ 1.34614625 10.20300693]
  - \* v\_ann: [6.30132532119751, 5.685832500457764, 12.4

28665091344943]

---

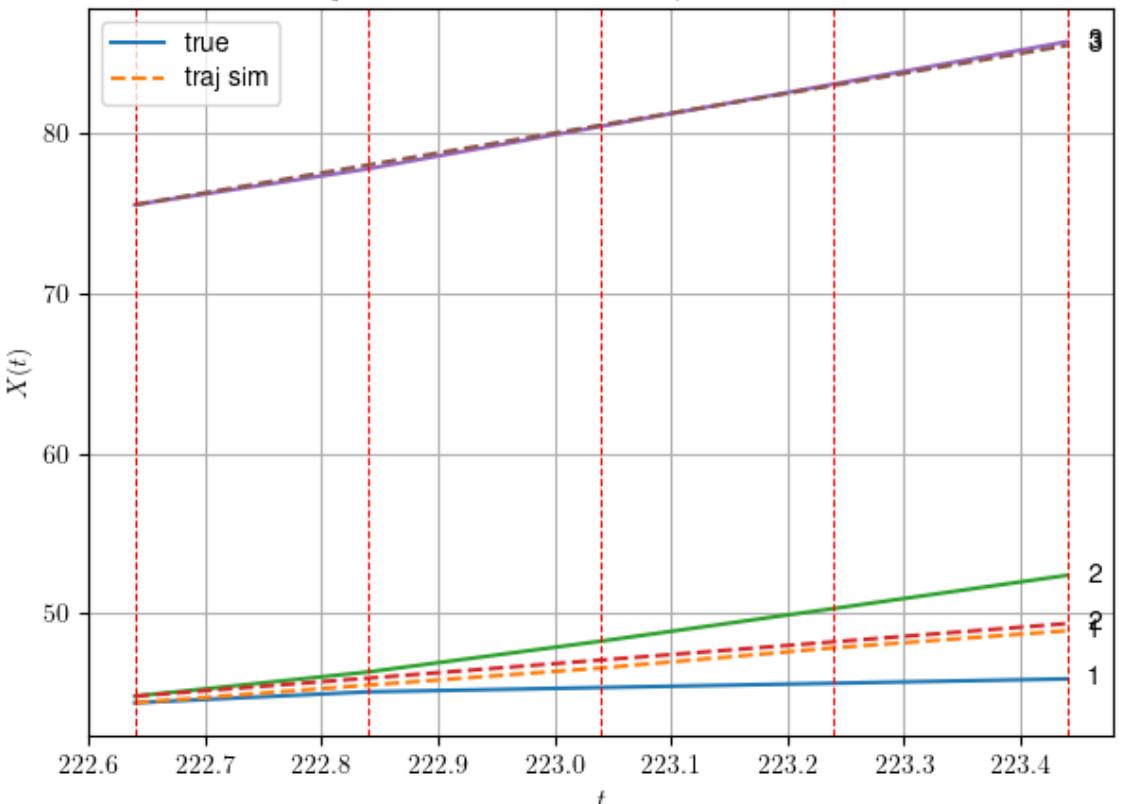
- Time interval n.3: [223.24, 223.44]
  - \* y\_true: [ 1.34614625 10.35053943]
  - \* v\_ann: [5.324819564819336, 5.700601577758789, 12.

428665091344943]

---

- \* err= 2.0425854110969826
- \* Learning rate NN = 0.000239148415857926
- \* diff = 0.0001640143241781189

*df n. 8 – Scene n. 6, at it = 350*



For scene 6/21

- \* use LR\_NN=0.0005 with err=25.24938283639122 at it=19
- \* v0\_scn\_mean = 13.93465211817708
- \* MAE = 2.042456816534821

---

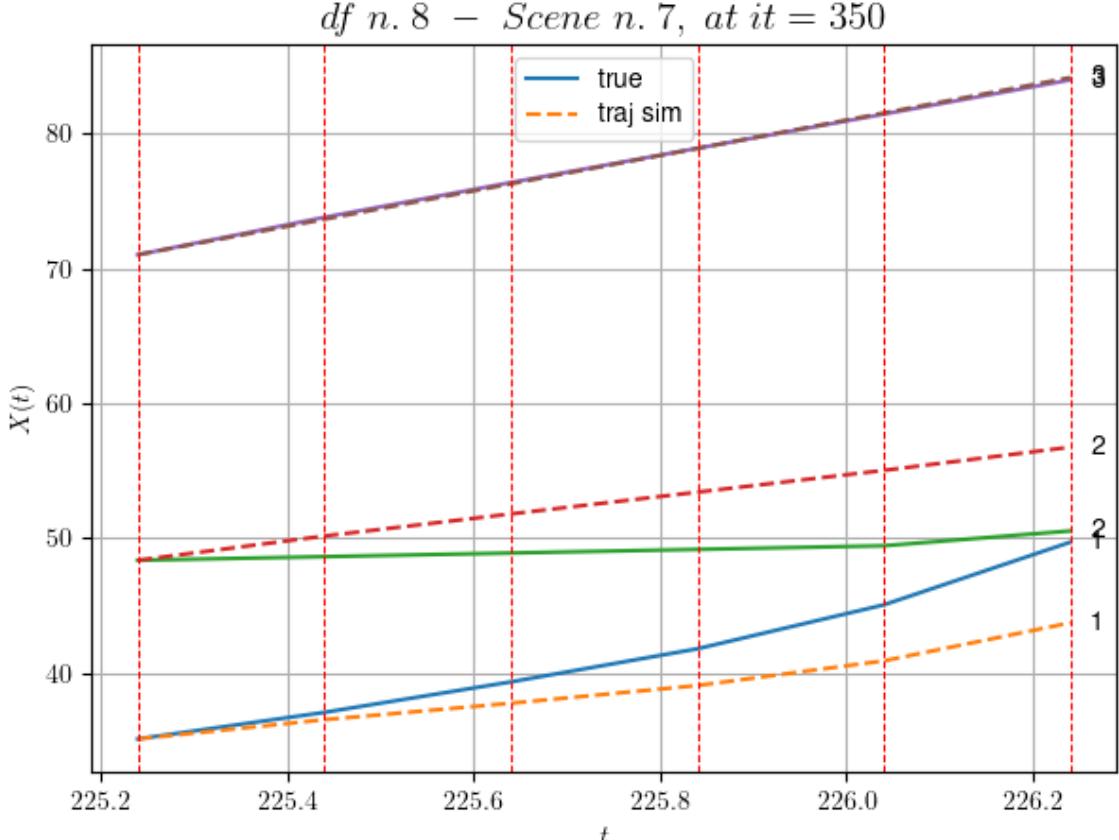


---

- Time interval n.0: [225.24, 225.44]
  - \* y\_true: [9.85023046 1.34614625]
  - \* v\_ann: [7.1457743644714355, 8.985125541687012, 1

3.143805199617178]

```
-----  
-----  
    - Time interval n.1: [225.44, 225.64]  
      * y_true: [11.30531094  1.34614625]  
      * v_ann: [6.097863674163818, 8.197474479675293, 13.  
143805199617178]  
  
-----  
-----  
    - Time interval n.2: [225.64, 225.84]  
      * y_true: [12.27536459  1.34614625]  
      * v_ann: [6.569976806640625, 8.076000213623047, 13.  
143805199617178]  
  
-----  
-----  
    - Time interval n.3: [225.84, 226.04]  
      * y_true: [16.30233516  1.34614625]  
      * v_ann: [9.153667449951172, 8.073773384094238, 13.  
143805199617178]  
  
-----  
-----  
    - Time interval n.4: [226.04, 226.24]  
      * y_true: [23.251759   5.49560672]  
      * v_ann: [14.110971450805664, 8.619746208190918, 1  
3.143805199617178]  
  
-----  
-----  
    * err= 8.995381631048437  
    * Learning rate NN = 0.0003874204121530056  
    * diff = 0.008167673806280362
```



For scene 7/21

- \* use LR\_NN=0.001 with err=52.440103411280234 at it=19
- \* v0\_scn\_mean = 14.588499687719501
- \* MAE = 8.323443577977374

---



---

- Time interval n.0: [227.04, 227.24]
- \* y\_true: [ 1.34614625 11.86069537]
- \* v\_ann: [12.799598693847656, 6.12930154800415, 26.24318261171468]

---

- Time interval n.1: [227.24, 227.44]
- \* y\_true: [ 1.34614625 11.90074479]
- \* v\_ann: [9.160584449768066, 6.408632278442383, 26.24318261171468]

---

- Time interval n.2: [227.44, 227.64]
- \* y\_true: [ 1.34614625 14.03099458]
- \* v\_ann: [6.208717346191406, 7.1316423416137695, 26.24318261171468]

---

- Time interval n.3: [227.64, 227.84]
- \* y\_true: [ 1.34614625 15.45116111]
- \* v\_ann: [5.403680801391602, 7.379220962524414, 26.

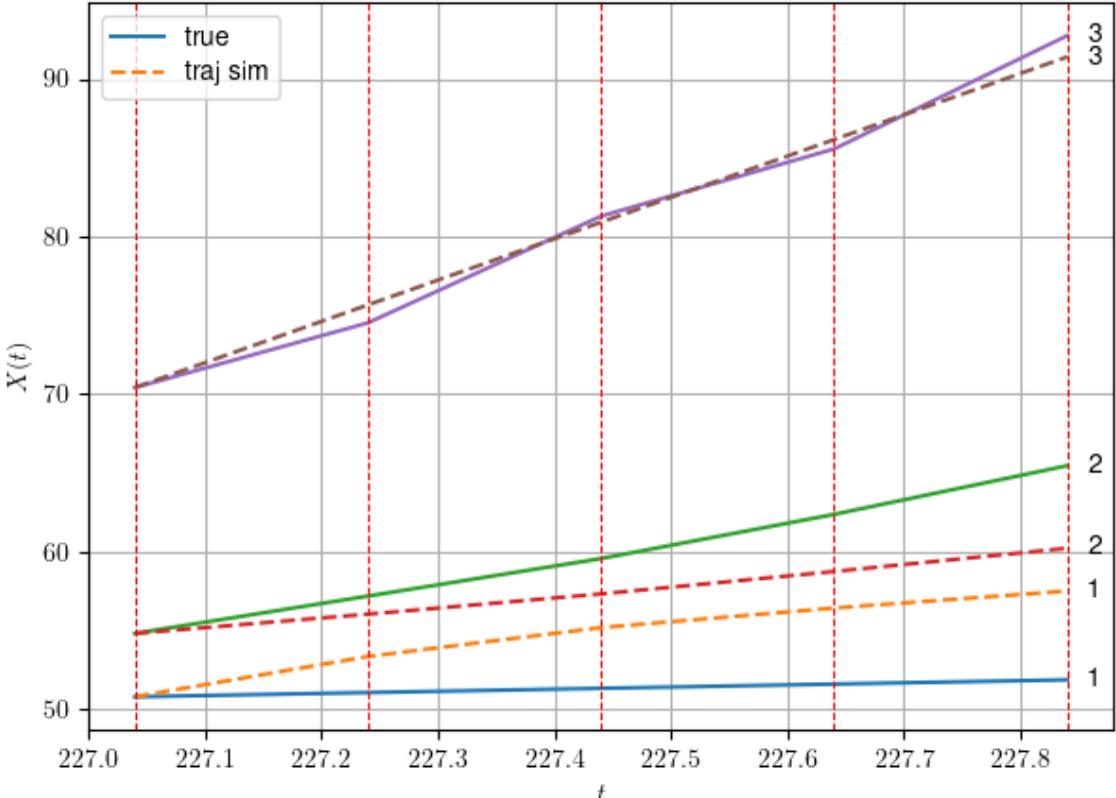
24318261171468]

```

* err= 8.381456574279564
* Learning rate NN = 4.782968062500004e-06
* diff = 0.027110603479995277

```

*df n. 8 – Scene n. 8, at it = 350*



For scene 8/21

```

* use LR_NN=1e-05 with err=2.7170949633232304 at it=19
* v0_scn_mean = 26.56516829341416
* MAE = 8.381456574279564

```

---



---



---

- Time interval n.0: [237.64, 237.84]  
\* y\_true: [17.80043487 10.22573725]  
\* v\_ann: [15.424793243408203, 15.093107223510742, 2  
9.702969638682323]

---



---



---

- Time interval n.1: [237.84, 238.04]  
\* y\_true: [20.29063338 11.60088234]  
\* v\_ann: [14.71318244934082, 14.603593826293945, 2  
9.702969638682323]

---



---

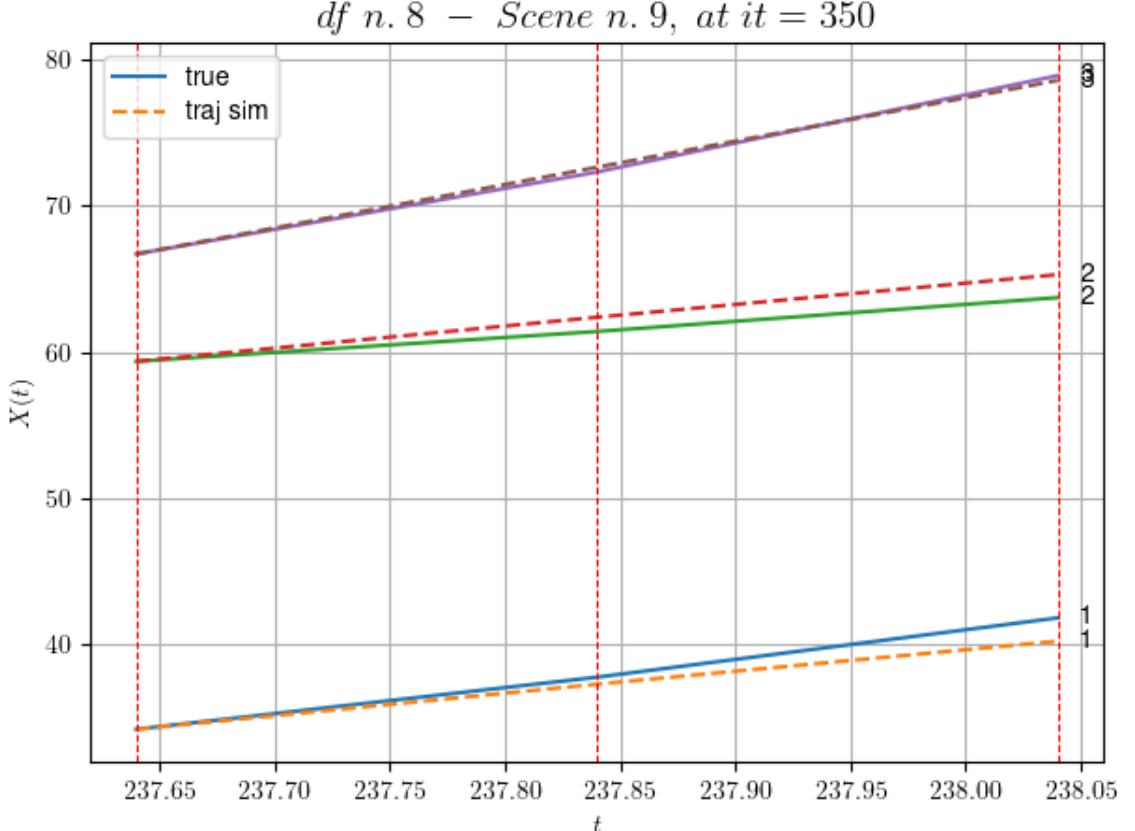


---

```

* err= 0.710987028495288
* Learning rate NN = 0.00036449998151510954
* diff = 0.0004363289140485449

```



For scene 9/21

- \* use LR\_NN=0.0005 with err=0.24549538595995798 at it=19
- \* v0\_scn\_mean = 29.72842723043832
- \* MAE = 0.21206137428417712

---



---

- Time interval n.0: [239.84, 240.04]
- \* y\_true: [16.30079237 13.85576065]
- \* v\_ann: [15.664827346801758, 16.355812072753906, 3 0.13123859028378]

---



---

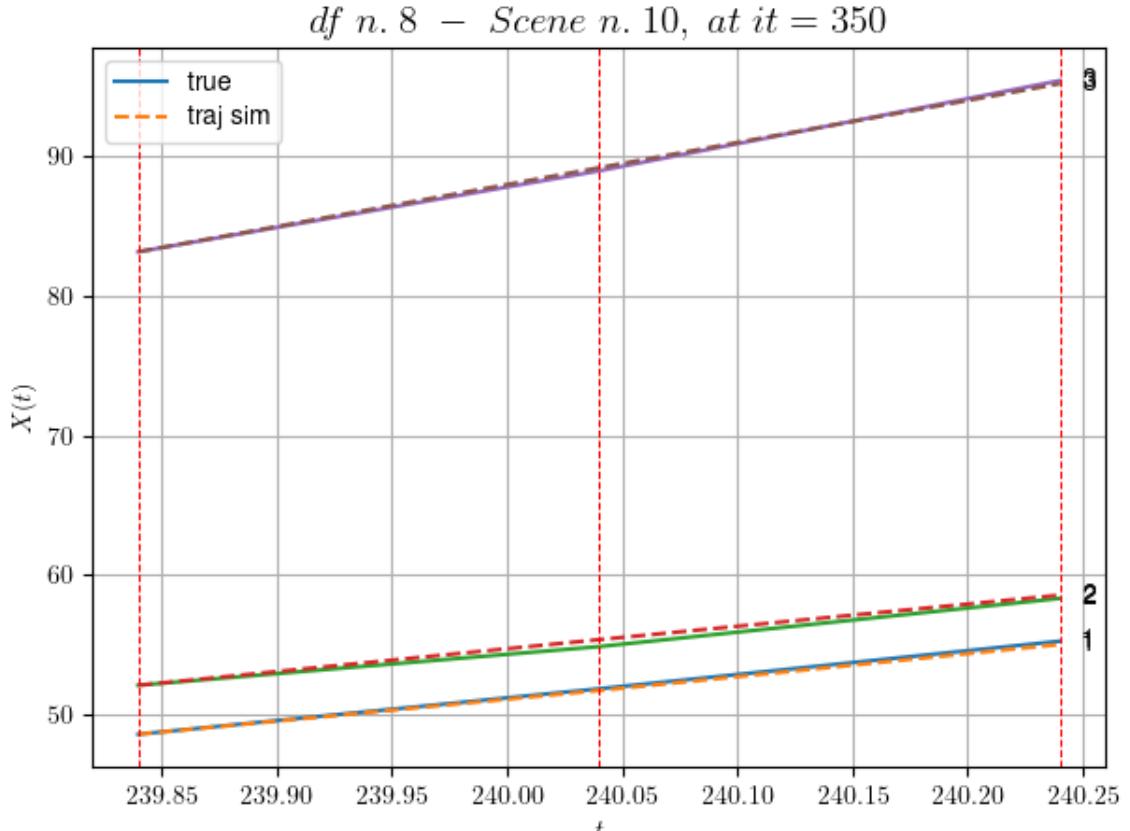
- Time interval n.1: [240.04, 240.24]
- \* y\_true: [17.06097057 17.27611431]
- \* v\_ann: [16.534744262695312, 15.939733505249023, 3 0.13123859028378]

---



---

- \* err= 0.05288759761113021
- \* Learning rate NN = 0.0007289999630302191
- \* diff = 2.8590500987933642e-05



For scene 10/21

- \* use LR\_NN=0.001 with err=3.0784340088097655 at it=19
- \* v0\_scn\_mean = 30.119990519752687
- \* MAE = 0.05288759761113021

---



---

For scene 11/21

- \* use LR\_NN=0.001 with err=24.18404914805423 at it=19
- \* v0\_scn\_mean = 18.02582251732012
- \* MAE = 1.3905972970448872

---



---

For scene 12/21

- \* use LR\_NN=0.0005 with err=28.659938847379994 at it=19
- \* v0\_scn\_mean = 21.428938019741217
- \* MAE = 0.44171678260087677

---



---

- Time interval n.0: [290.84, 291.04]
- \* y\_true: [10.67508652 21.71084933]
- \* v\_ann: [14.537008285522461, 16.326326370239258, 2 5.378277675805634]

---

```

-----  

    - Time interval n.1: [291.04, 291.24]  

      * y_true: [ 9.47510968 18.71084105]  

      * v_ann: [14.924216270446777, 16.451841354370117, 2  

      5.378277675805634]
-----
```

```

-----  

    - Time interval n.2: [291.24, 291.44]  

      * y_true: [ 9.47510968 24.76138307]  

      * v_ann: [15.13538646697998, 16.82621955871582, 25.  

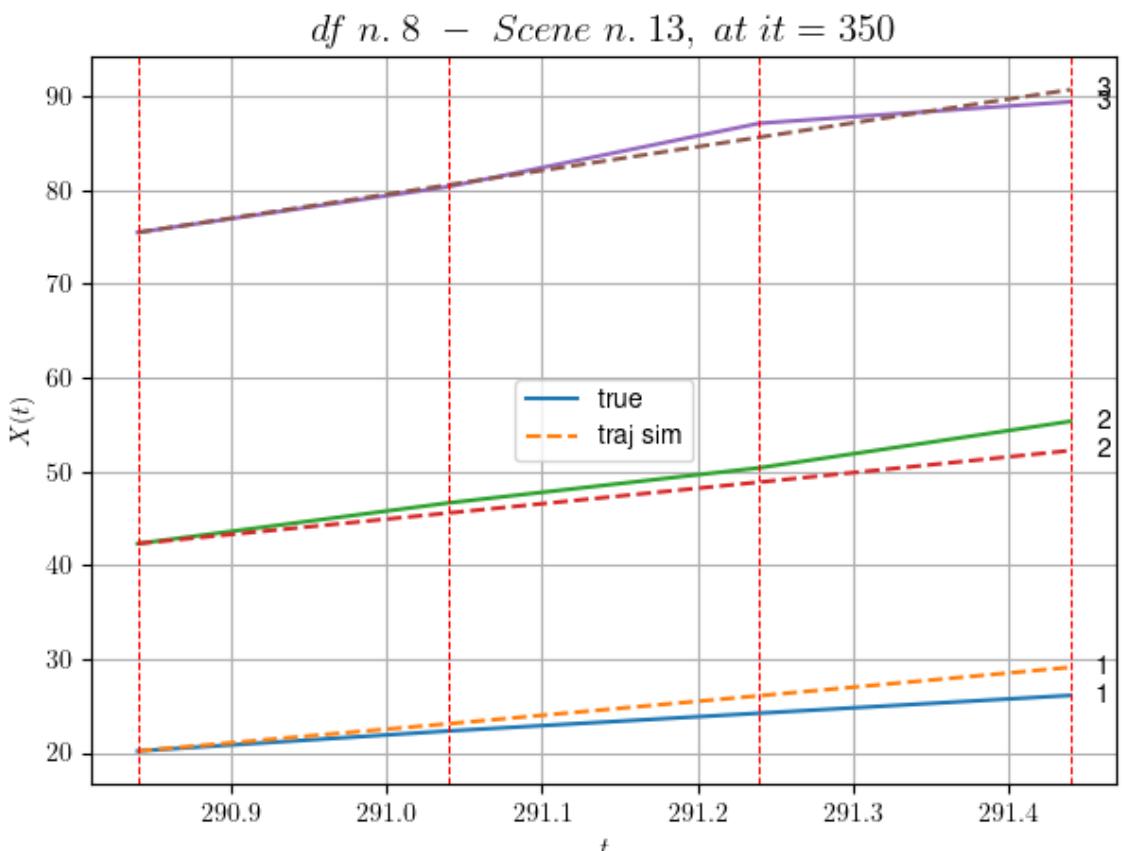
      378277675805634]
-----
```

```

* err= 2.514210368419757  

* Learning rate NN = 2.952449540316593e-05  

* diff = 0.003375606713075463
```



```

For scene 13/21
* use LR_NN=5e-05 with err=2.303465034183876 at it=19
* v0_scn_mean = 25.774391795651436
* MAE = 2.402017718714149
=====
```

```

-----  

    - Time interval n.0: [350.64, 350.84]  

      * y_true: [14.24956692 9.34769854]  

      * v_ann: [15.484840393066406, 15.607870101928711, 2  

      4.017599259793506]
-----
```

```

-----  

- Time interval n.1: [350.84, 351.04]  

  * y_true: [ 4.06677119 24.77080184]  

  * v_ann: [12.607816696166992, 16.354013442993164, 2  

  4.017599259793506]  

-----  

- Time interval n.2: [351.04, 351.24]  

  * y_true: [15.46321179 18.97073364]  

  * v_ann: [17.557212829589844, 16.007204055786133, 2  

  4.017599259793506]  

-----  

- Time interval n.3: [351.24, 351.44]  

  * y_true: [19.89069297 18.71086293]  

  * v_ann: [17.00478172302246, 16.513172149658203, 2  

  4.017599259793506]  

-----  

- Time interval n.4: [351.44, 351.64]  

  * y_true: [17.2007296 18.34097485]  

  * v_ann: [17.265241622924805, 16.817485809326172, 2  

  4.017599259793506]  

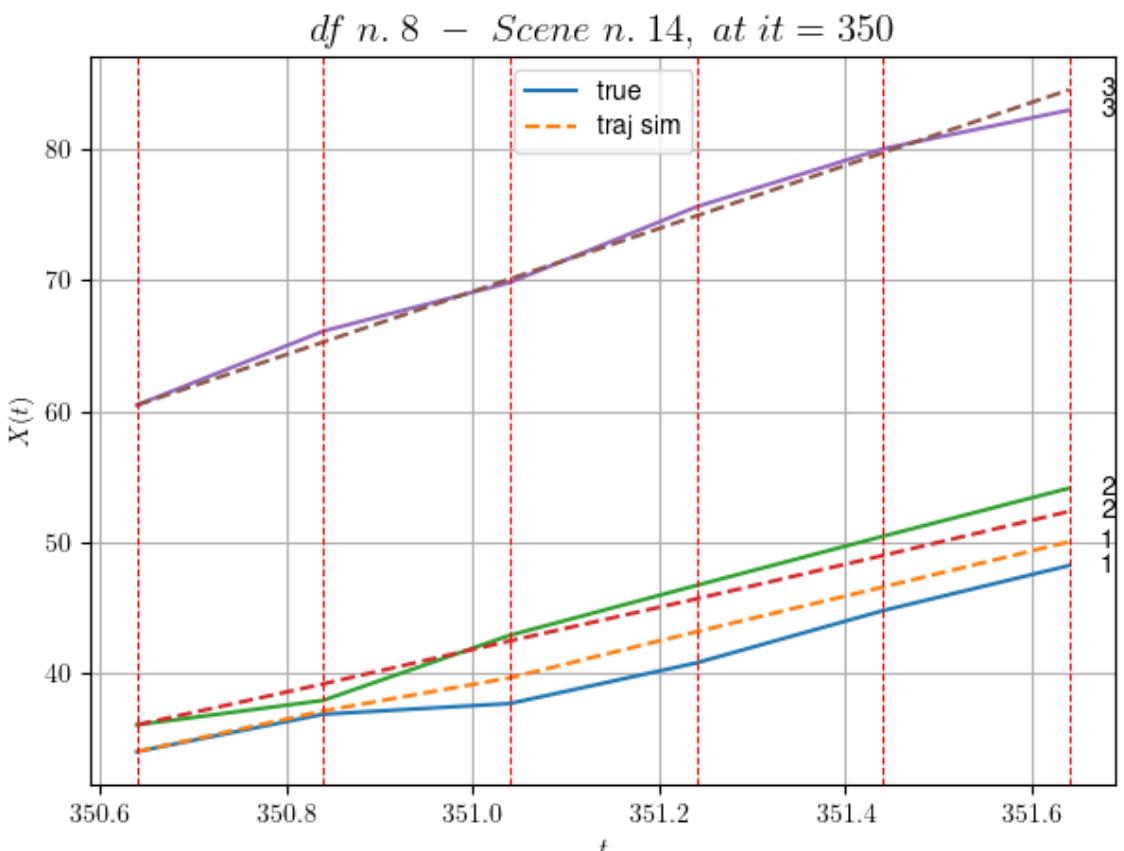
-----  

* err= 1.5454028321134696  

* Learning rate NN = 3.874203684972599e-05  

* diff = 0.0016319478059223513

```



For scene 14/21

\* use LR\_NN=0.0001 with err=14.083955648709598 at it=19

\* v0\_scn\_mean = 24.530333093102293

\* MAE = 1.5454028321134696

- Time interval n.0: [368.84, 369.04]

\* y\_true: [17.45059381 8.87536169]

\* v\_ann: [13.520064353942871, 12.185446739196777, 1  
7.012105849840474]

- Time interval n.1: [369.04, 369.24]

\* y\_true: [23.11801305 8.05829994]

\* v\_ann: [15.307043075561523, 12.747060775756836, 1  
7.012105849840474]

- Time interval n.2: [369.24, 369.44]

\* y\_true: [ 6.12528304 15.69072344]

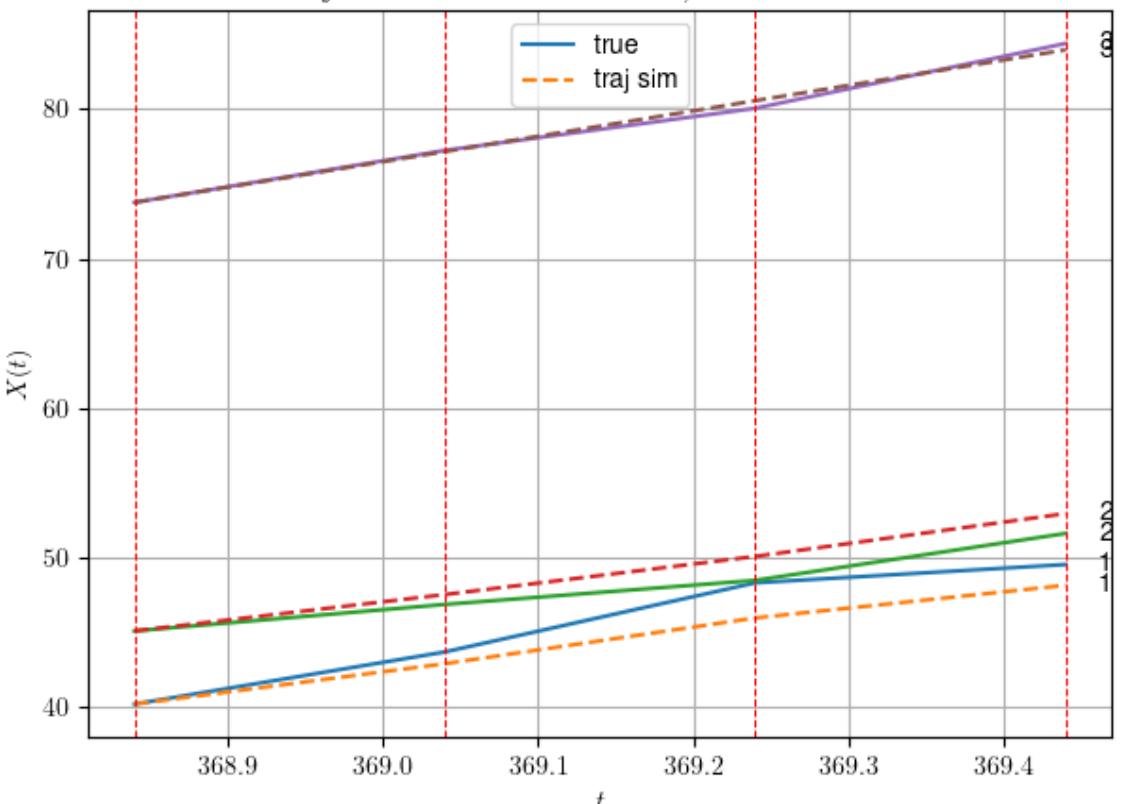
\* v\_ann: [10.924558639526367, 14.345404624938965, 1  
7.012105849840474]

\* err= 1.1064789745723356

\* Learning rate NN = 0.0005904899444431067

\* diff = 0.0006032519555789762

*df n. 8 – Scene n. 15, at it = 350*



For scene 15/21

```
* use LR_NN=0.001 with err=16.782969482638556 at it=19
* v0_scn_mean = 18.125259756342167
* MAE = 1.014661354949947
```

---

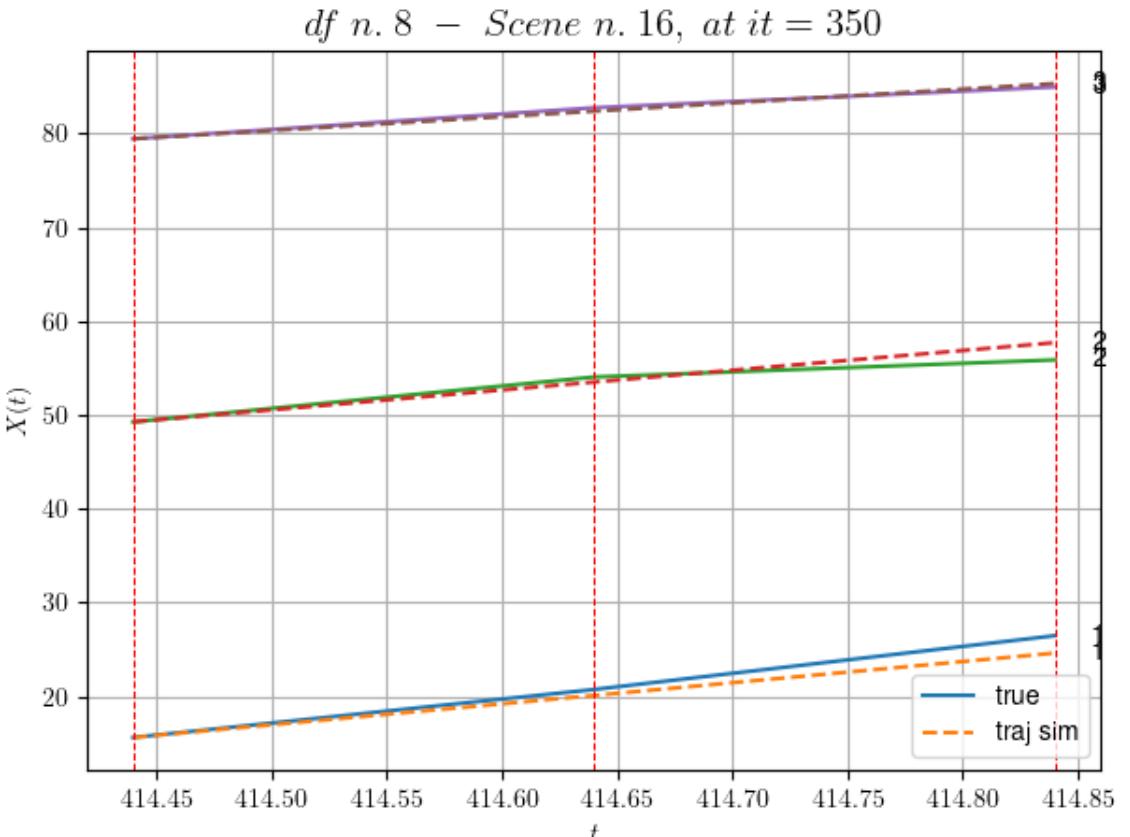


---

```
- Time interval n.0: [414.44, 414.64]
  * y_true: [25.58017481 23.93124381]
  * v_ann: [22.41219139099121, 21.244182586669922, 1
4.740338902152256]

-----
- Time interval n.1: [414.64, 414.84]
  * y_true: [28.7103211 9.12051681]
  * v_ann: [22.610193252563477, 21.025850296020508, 1
4.740338902152256]

-----
* err= 0.8667874775979838
* Learning rate NN = 3.6449993785936385e-05
* diff = 4.54408842831544e-06
```



For scene 16/21

```
* use LR_NN=5e-05 with err=6.102099859557323 at it=19
* v0_scn_mean = 16.048199219348923
* MAE = 0.8667874775979838
```

---



---

```
- Time interval n.0: [477.84, 478.04]
  * y_true: [17.90015387 15.74042221]
  * v_ann: [18.51304054260254, 18.95891571044922, 21.
268222396991753]

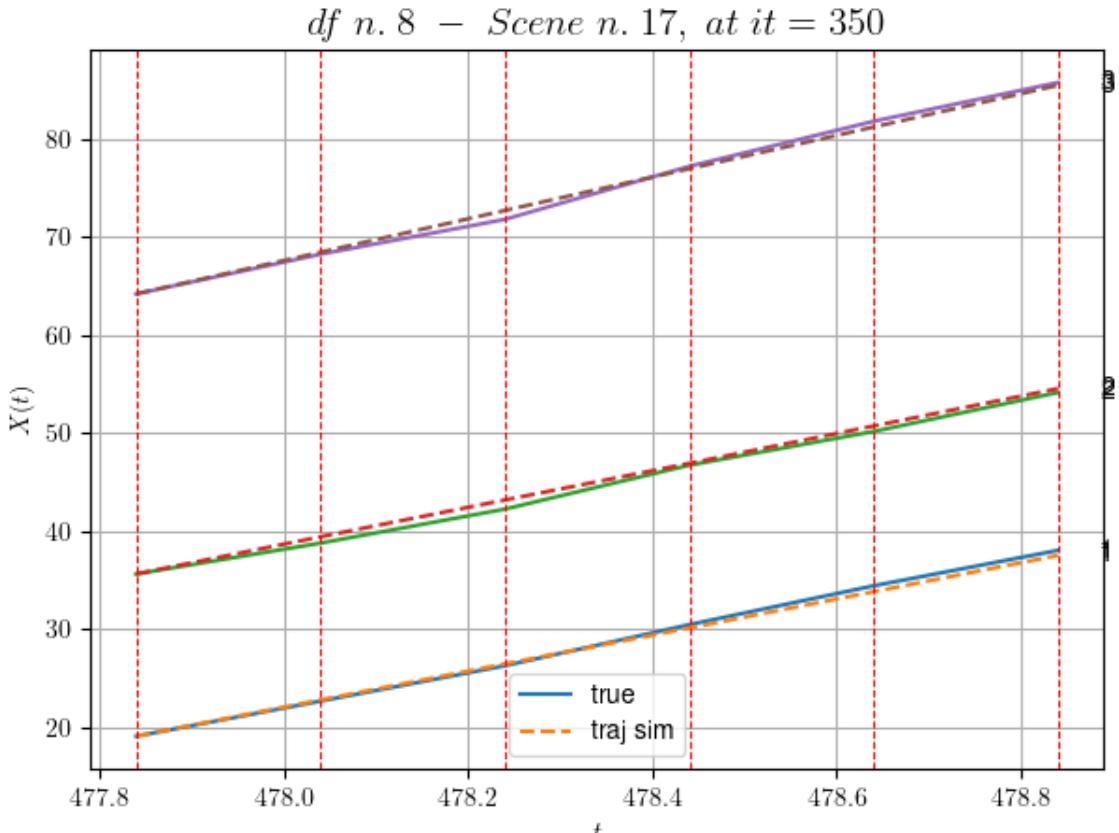
-----
- Time interval n.1: [478.04, 478.24]
  * y_true: [18.02021575 17.32056356]
  * v_ann: [18.358989715576172, 18.760543823242188, 2
1.268222396991753]

-----
- Time interval n.2: [478.24, 478.44]
  * y_true: [20.95033635 22.3908747 ]
  * v_ann: [18.289108276367188, 18.6516170501709, 21.
268222396991753]

-----
- Time interval n.3: [478.44, 478.64]
  * y_true: [19.80040923 17.17076636]
  * v_ann: [18.52093505859375, 19.060501098632812, 2
1.268222396991753]

-----
- Time interval n.4: [478.64, 478.84]
  * y_true: [18.07046469 19.89107551]
  * v_ann: [18.474519729614258, 19.055513381958008, 2
1.268222396991753]

-----
* err= 0.21841316844318767
* Learning rate NN = 3.874203684972599e-05
* diff = 0.0022502558949653306
```



For scene 17/21

```
* use LR_NN=0.0001 with err=15.962712889771707 at it=19
* v0_scn_mean = 22.016597171001987
* MAE = 0.21841316844318767
```

---



---

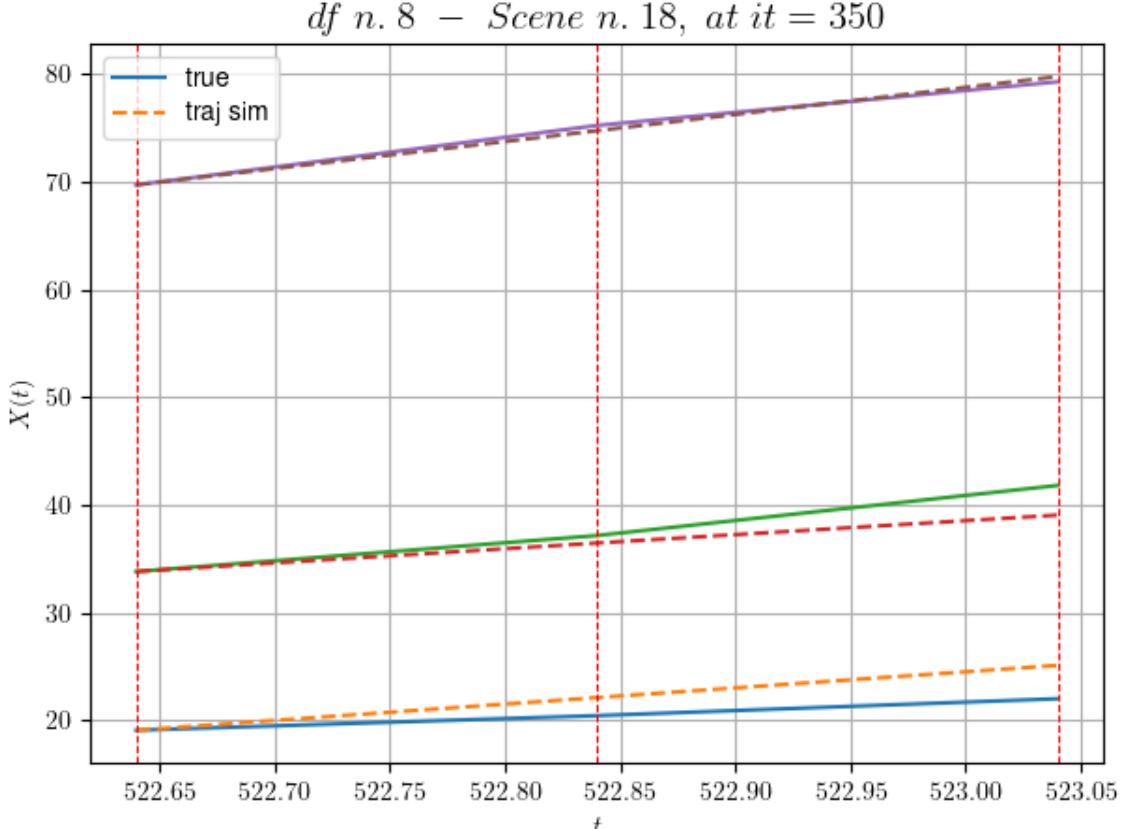
```
- Time interval n.0: [522.64, 522.84]
* y_true: [ 6.78505349 16.71042372]
* v_ann: [15.175409317016602, 13.235203742980957, 2
5.156007884721372]
```

---

```
- Time interval n.1: [522.84, 523.04]
* y_true: [ 7.85007105 23.28071684]
* v_ann: [14.966771125793457, 12.981854438781738, 2
5.156007884721372]
```

---

```
* err= 2.331313728157433
* Learning rate NN = 7.289998848136747e-06
* diff = 0.004260245779425631
```



For scene 18/21

\* use LR\_NN=1e-05 with err=0.7688639824539177 at it=19  
 \* v0\_scn\_mean = 25.571172089467904  
 \* MAE = 2.331313728157433

---



---

- Time interval n.0: [593.04, 593.24]  
 \* y\_true: [18.14041096 18.46062677]  
 \* v\_ann: [19.419734954833984, 18.588441848754883, 2  
 0.29790615493367]

---

- Time interval n.1: [593.24, 593.44]  
 \* y\_true: [15.67042287 23.16095213]  
 \* v\_ann: [19.2301025390625, 18.671884536743164, 20.  
 29790615493367]

---

- Time interval n.2: [593.44, 593.64]  
 \* y\_true: [13.25043489 21.00101152]  
 \* v\_ann: [18.538747787475586, 18.581113815307617, 2  
 0.29790615493367]

---

- Time interval n.3: [593.64, 593.84]  
 \* y\_true: [14.30052292 21.80126526]  
 \* v\_ann: [18.364545822143555, 18.42436408996582, 2

0.29790615493367]

```
- Time interval n.4: [593.84, 594.04]
  * y_true: [14.50059166 23.66159236]
  * v_ann: [18.88792610168457, 18.798507690429688, 2
```

0.29790615493367]

```
- Time interval n.5: [594.04, 594.24]
  * y_true: [17.13492662 22.4617536 ]
  * v_ann: [19.81134033203125, 19.337833404541016, 2
```

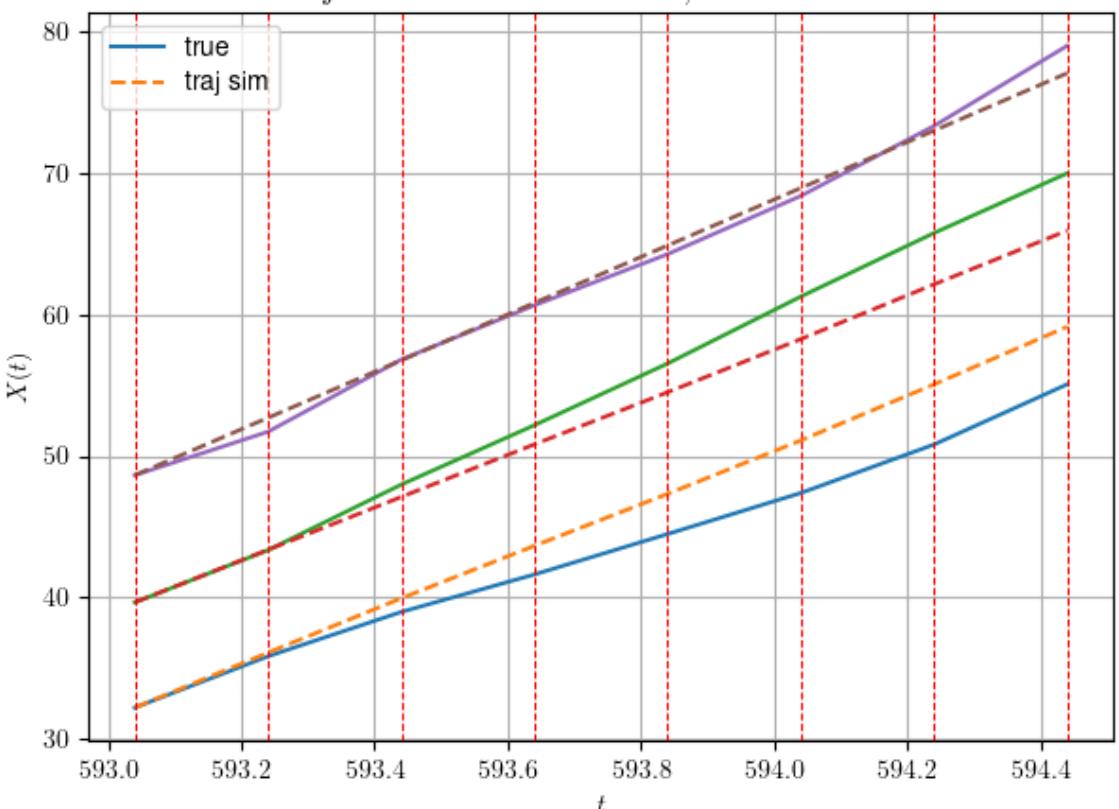
0.29790615493367]

```
- Time interval n.6: [594.24, 594.44]
  * y_true: [21.29116558 21.12188145]
  * v_ann: [20.378278732299805, 19.009790420532227, 2
```

0.29790615493367]

```
* err= 4.6870747533573285
* Learning rate NN = 0.00025418648147024214
* diff = 0.0003000239383021963
```

*df n. 8 – Scene n. 19, at it = 350*



For scene 19/21

```
* use LR_NN=0.001 with err=30.408632152884596 at it=19
* v0_scn_mean = 21.129443857659837
* MAE = 4.676178180561989
```

```
=====
=====

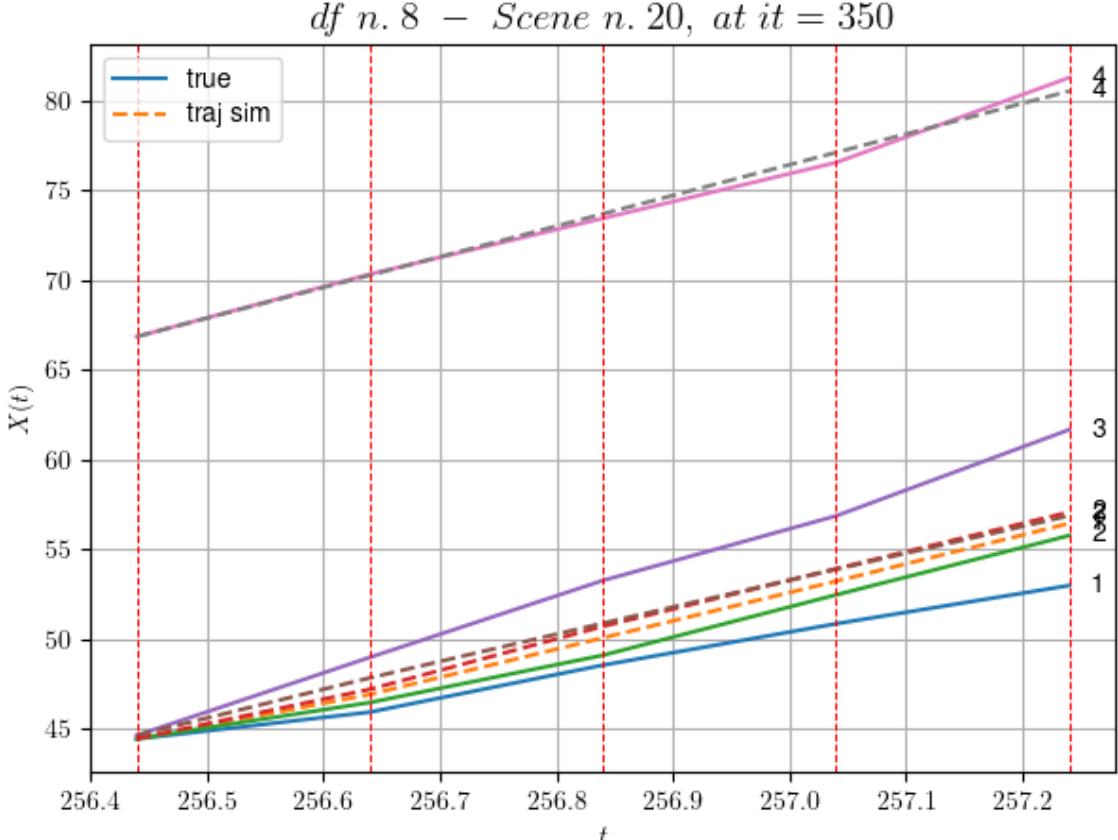
    - Time interval n.0: [256.44, 256.64]
        * y_true: [ 7.48303167 10.07767618 21.73093279]
        * v_ann: [12.409591674804688, 13.75952434539795, 1
6.023956298828125, 17.10609187367735]

-----
    - Time interval n.1: [256.64, 256.84]
        * y_true: [13.09283525 13.17831107 21.42106847]
        * v_ann: [15.767009735107422, 17.551292419433594, 1
5.206307411193848, 17.10609187367735]

-----
    - Time interval n.2: [256.84, 257.04]
        * y_true: [11.5255681 16.82586504 17.99104223]
        * v_ann: [15.786279678344727, 16.049652099609375, 1
5.026787757873535, 17.10609187367735]

-----
    - Time interval n.3: [257.04, 257.24]
        * y_true: [10.66053629 16.53589178 24.03163218]
        * v_ann: [16.10736656188965, 15.771377563476562, 1
4.947795867919922, 17.10609187367735]

-----
* err= 3.381434895851208
* Learning rate NN = 0.000478296831715852
* diff = 0.00025573678125256905
```



For scene 20/21

\* use LR\_NN=0.001 with err=12.025454658654503 at it=19  
\* v0\_scn\_mean = 18.57781148412369  
\* MAF = 3.3604592904911614

For df=8 with 21 scenes, time taken: 234.50

In df n 9/10 we have 9 scenes

\*\*\*\*\*

\*\*\*\*\*

- Time interval n.0: [5.40, 5.60]

\* y\_true: [17.46255149 32.38946228]

\* v\_ann: [26.078208923339844, 27.416059494018555, 2

9.0811137199230961

- Time interval n-1: [5, 60, 5, 80]

\* v true: [27 89361325 30 52270411]

\* y\_true: [27.05501525 30.52270411]  
\* y\_ANN: [25.989521026611328, 26.746315002441406, 2

9.0811137199230961

- Time interval n.2: [5.80, 6.00]

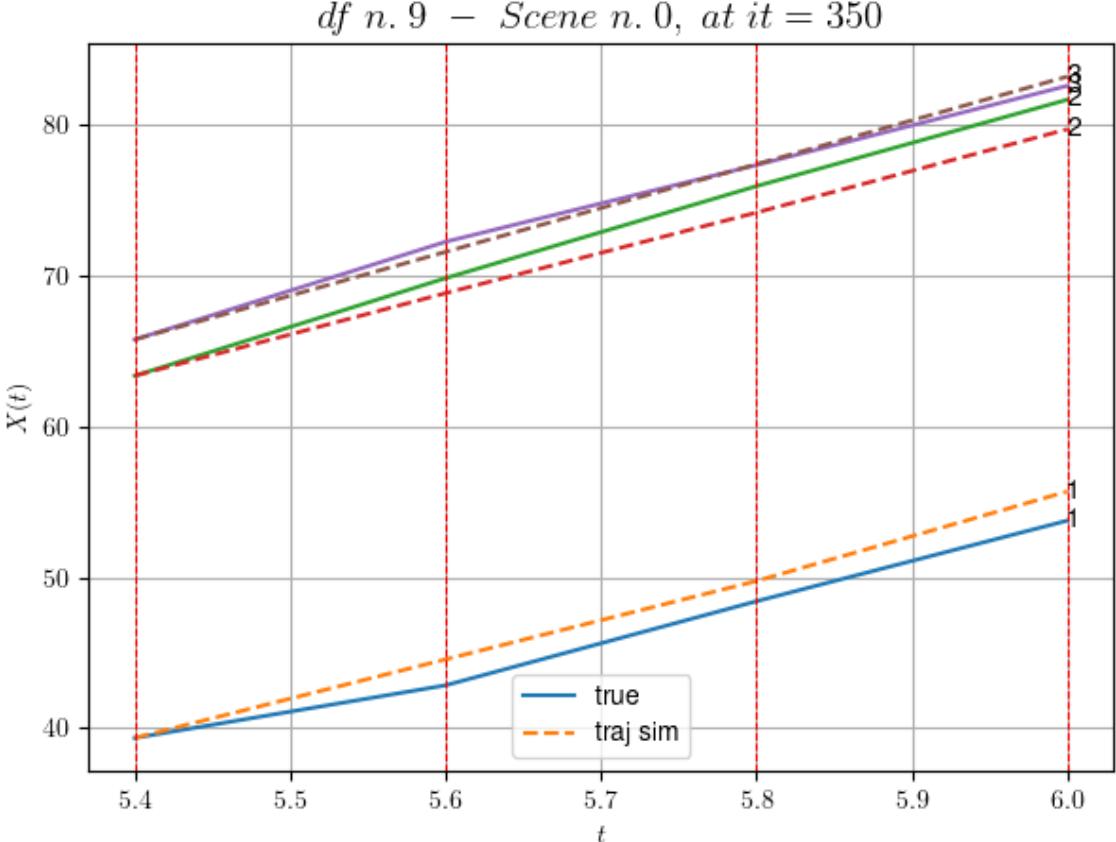
```
* y_true: [26.75613901 28.6867411 ]
* v_ann: [29.707612991333008, 27.637237548828125, 2
9.081113719923096]
```

---



---

```
* err= 1.4356544409609182
* Learning rate NN = 0.0005904899444431067
* diff = 0.0006150501294981403
```



For scene 0/9

```
* use LR_NN=0.001 with err=26.350442972438103 at it=19
* v0_scn_mean = 29.159868739056456
* MAE = 1.2089565915068161
```

---



---

```
- Time interval n.0: [20.80, 21.00]
* y_true: [29.01888251 26.46522664]
* v_ann: [27.753307342529297, 27.43874740600586, 3
2.733291821512346]
```

---



---

```
- Time interval n.1: [21.00, 21.20]
* y_true: [29.93697896 25.84808908]
* v_ann: [27.885662078857422, 28.185380935668945, 3
2.733291821512346]
```

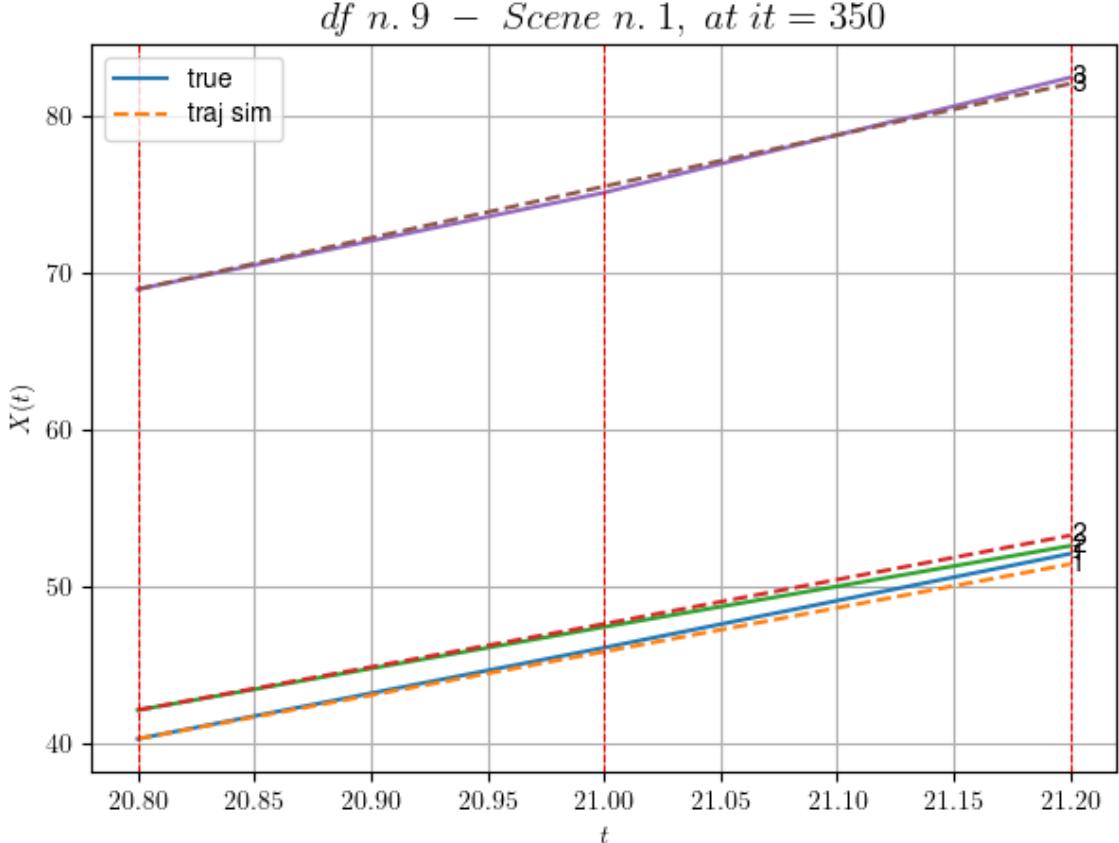
---



---

```
* err= 0.14354873517188885
```

\* Learning rate NN = 0.0007289999630302191  
 \* diff = 3.684650785235055e-06



For scene 1/9

\* use LR\_NN=0.001 with err=12.125953831330468 at it=19  
 \* v0\_scn\_mean = 32.499029482017754  
 \* MAE = 0.14125323843330861

---



---

- Time interval n.0: [37.80, 38.00]
  - \* y\_true: [21.35828745 27.25004814]
  - \* v\_ann: [21.608205795288086, 21.849491119384766, 23.63909703244711]

---

- Time interval n.1: [38.00, 38.20]
  - \* y\_true: [19.23626153 17.91519282]
  - \* v\_ann: [22.63544464111328, 22.449234008789062, 23.63909703244711]

---

- Time interval n.2: [38.20, 38.40]
  - \* y\_true: [24.96063116 28.62771944]
  - \* v\_ann: [21.05624008178711, 21.473674774169922, 23.63909703244711]

---

- Time interval n.3: [38.40, 38.60]

```

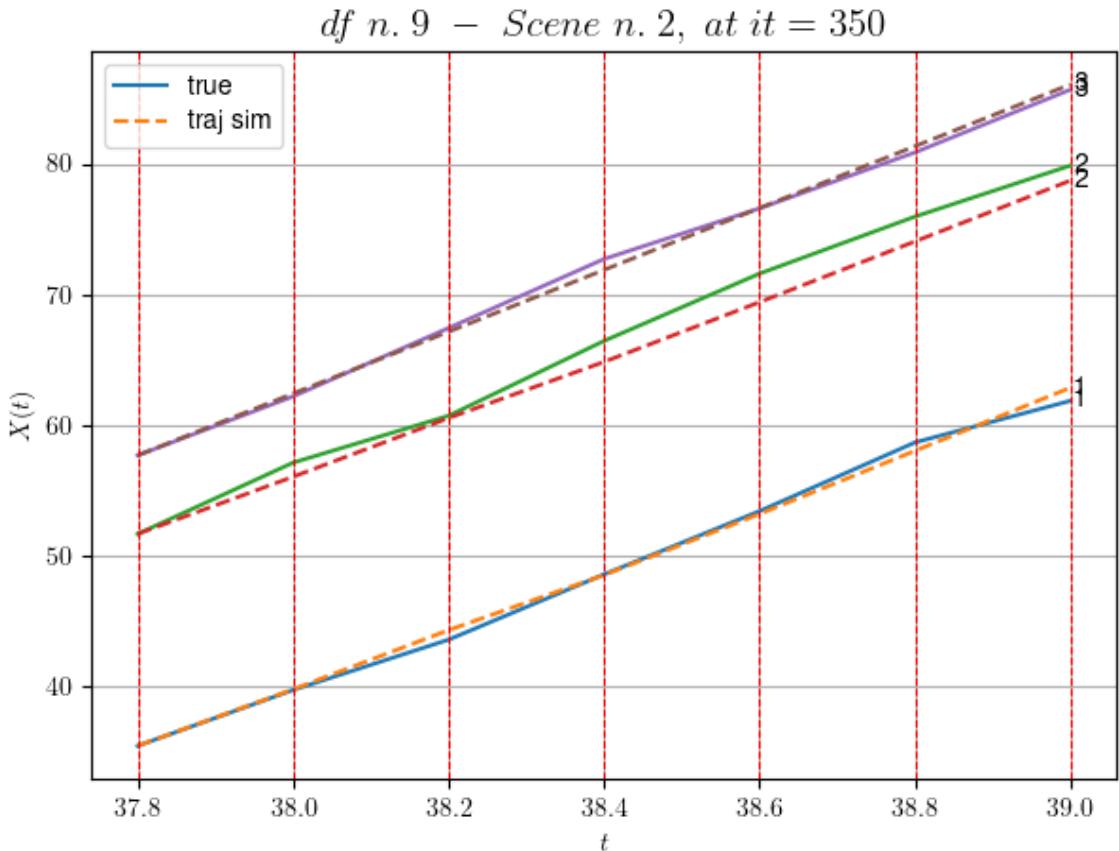
* y_true: [24.1844348 25.71934895]
* v_ann: [23.338634490966797, 22.832460403442383, 2
3.63909703244711]

-----
- Time interval n.4: [38.60, 38.80]
* y_true: [26.26418379 21.80127307]
* v_ann: [24.162315368652344, 23.219392776489258, 2
3.63909703244711]

-----
- Time interval n.5: [38.80, 39.00]
* y_true: [15.9216195 19.51476921]
* v_ann: [24.140361785888672, 23.276325225830078, 2
3.63909703244711]

-----
* err= 0.7928892181384297
* Learning rate NN = 0.00031381050939671695
* diff = 0.0002683253286730469

```



For scene 2/9  
\* use LR\_NN=0.001 with err=35.834695960507716 at it=19  
\* v0\_scn\_mean = 24.184271169635398  
\* MAE = 0.7803532476399456

---



---

- Time interval n.0: [44.40, 44.60]

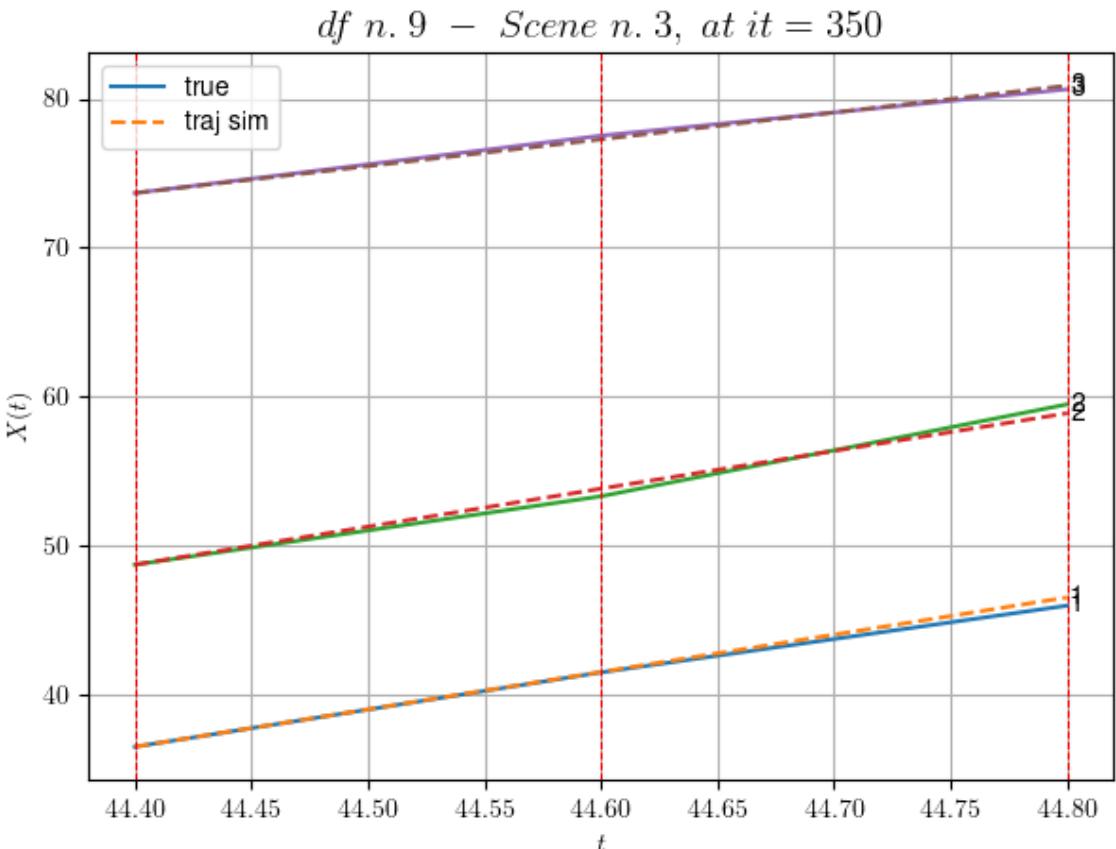
```

* y_true: [24.95803839 22.94664651]
* v_ann: [25.095260620117188, 25.506813049316406, 1
8.01619331410936]

-----
- Time interval n.1: [44.60, 44.80]
* y_true: [22.38974011 30.85088397]
* v_ann: [25.01418113708496, 25.29184913635254, 18.
01619331410936]

-----
* err= 0.11667986928003853
* Learning rate NN = 3.6449993785936385e-05
* diff = 0.0006631706210723232

```



For scene 3/9

```

* use LR_NN=5e-05 with err=5.619798556351753 at it=19
* v0_scn_mean = 19.043289860549024
* MAE = 0.09534341687352305
=====
```

```

=====
- Time interval n.0: [117.80, 118.00]
* y_true: [26.21501314 26.51617559]
* v_ann: [24.8874568939209, 23.50994110107422, 32.9
4780433300771]
```

```

    - Time interval n.1: [118.00, 118.20]
      * y_true: [24.27291409 32.45579962]
      * v_ann: [25.89539909362793, 25.78042221069336, 32.
94780433300771]

```

---

```

    - Time interval n.2: [118.20, 118.40]
      * y_true: [21.96072195 23.86482679]
      * v_ann: [26.47897720336914, 27.923160552978516, 3
2.94780433300771]

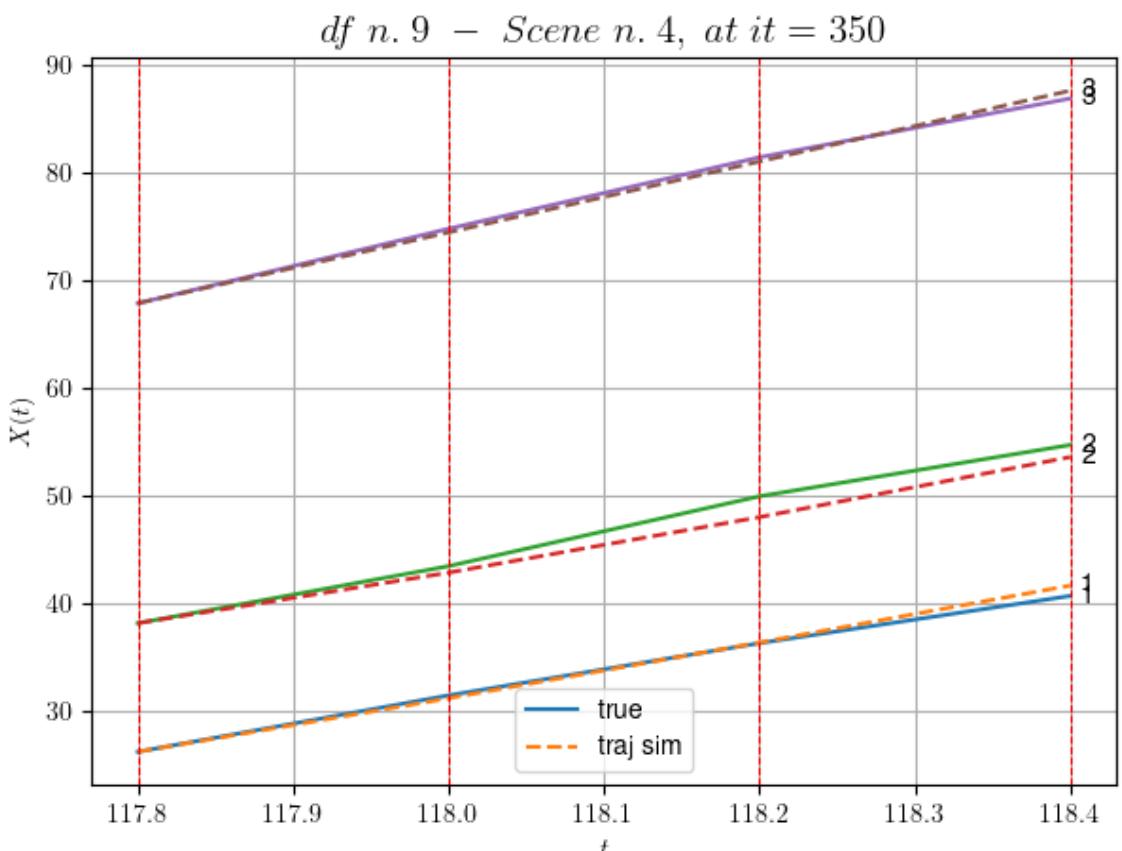
```

---

```

* err= 0.5982167147563934
* Learning rate NN = 0.0002952449722215533
* diff = 0.05055067100454205

```



For scene 4/9

```

* use LR_NN=0.0005 with err=7.234828118247265 at it=19
* v0_scn_mean = 32.69515676205051
* MAE = 0.555165917767725

```

---



---

```

    - Time interval n.0: [119.20, 119.40]
      * y_true: [23.20444186 22.52067771]
      * v_ann: [24.794620513916016, 25.432199478149414, 2
6.734613425844]

```

---



---

```

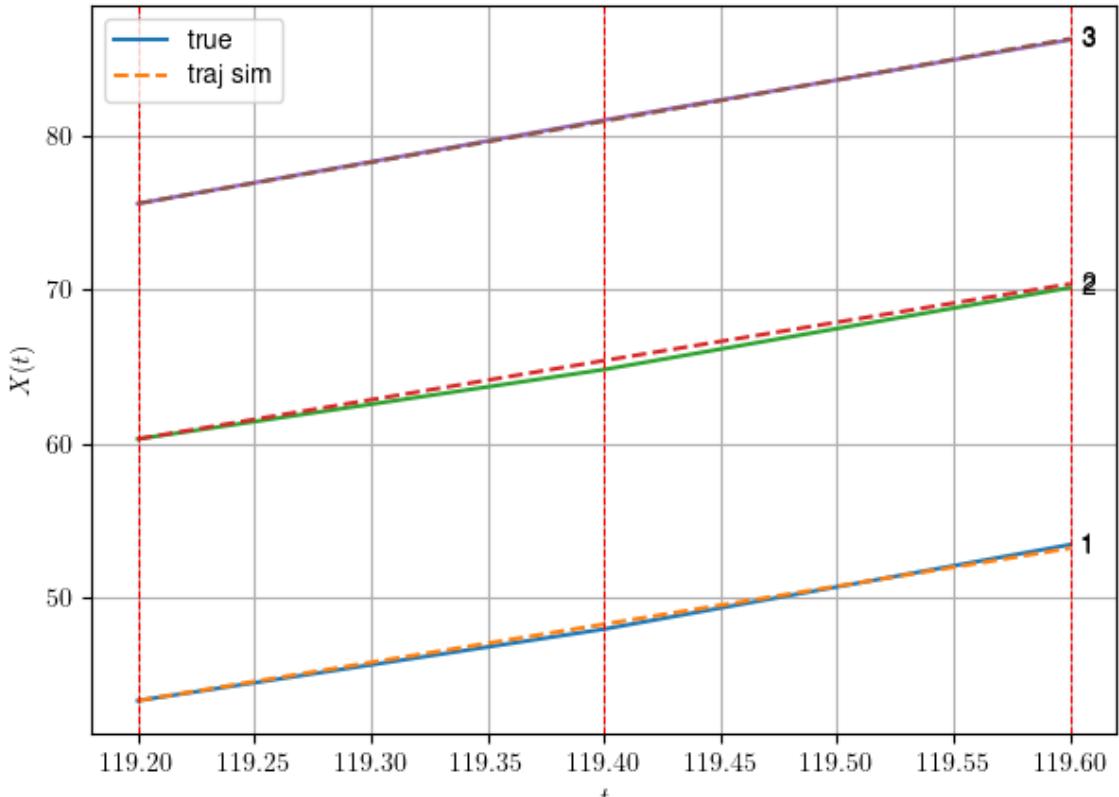
- Time interval n.1: [119.40, 119.60]
  * y_true: [27.39348249 26.5570173 ]
  * v_ann: [24.636892318725586, 24.876449584960938, 2
  6.734613425844]
```

---

```

* err= 0.06289532429629317
* Learning rate NN = 3.6449993785936385e-05
* diff = 2 08227850501610020 05
```

*df n. 9 – Scene n. 5, at it = 350*



For scene 5/9

```

* use LR_NN=5e-05 with err=0.29413793285417716 at it=19
* v0_scn_mean = 27.014480029254404
* MAE = 0.06289532429629317
```

---



---

```

- Time interval n.0: [120.20, 120.40]
  * y_true: [30.48045094 26.16776015]
  * v_ann: [26.771320343017578, 26.965017318725586, 2
  7.349006463343738]
```

---

```

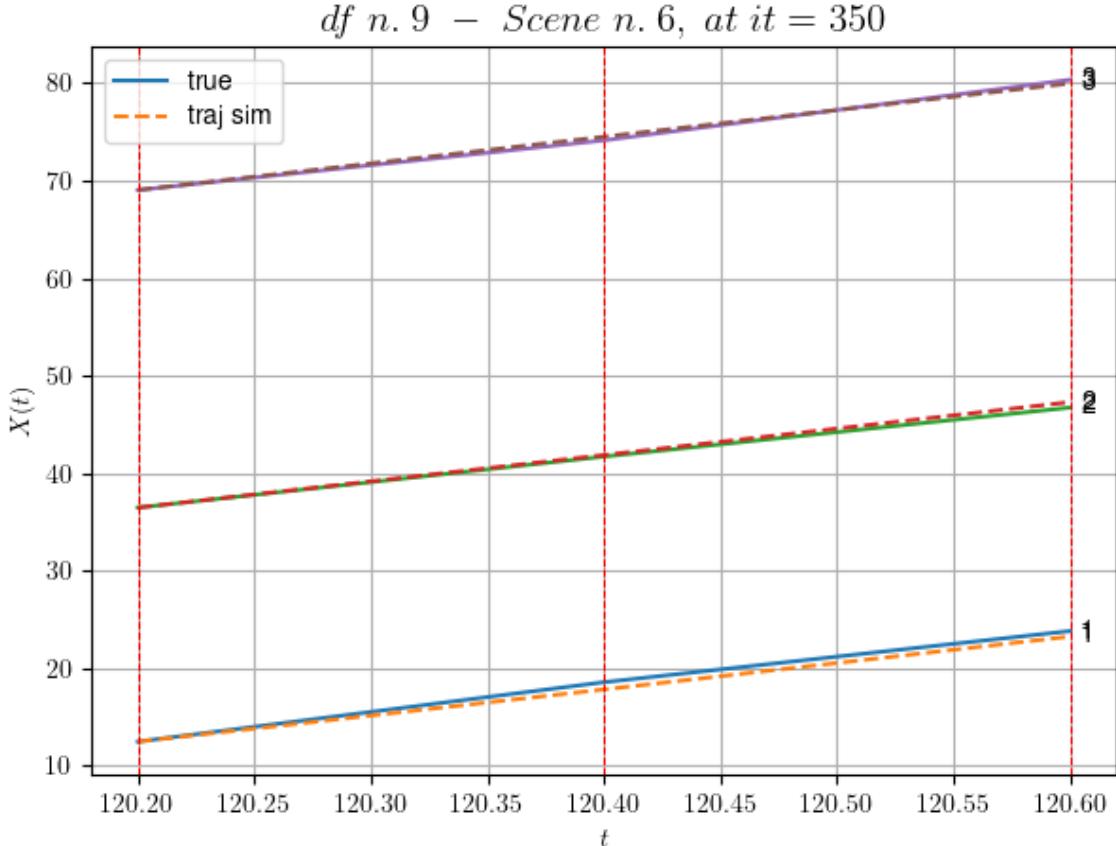
- Time interval n.1: [120.40, 120.60]
  * y_true: [26.23623075 25.12734403]
  * v_ann: [27.13734245300293, 27.14867401123047, 27.
  349006463343738]
```

---



---

```
* err= 0.1655647084283802
* Learning rate NN = 3.6449993785936385e-05
* diff = 2 3555580095584742e-05
```



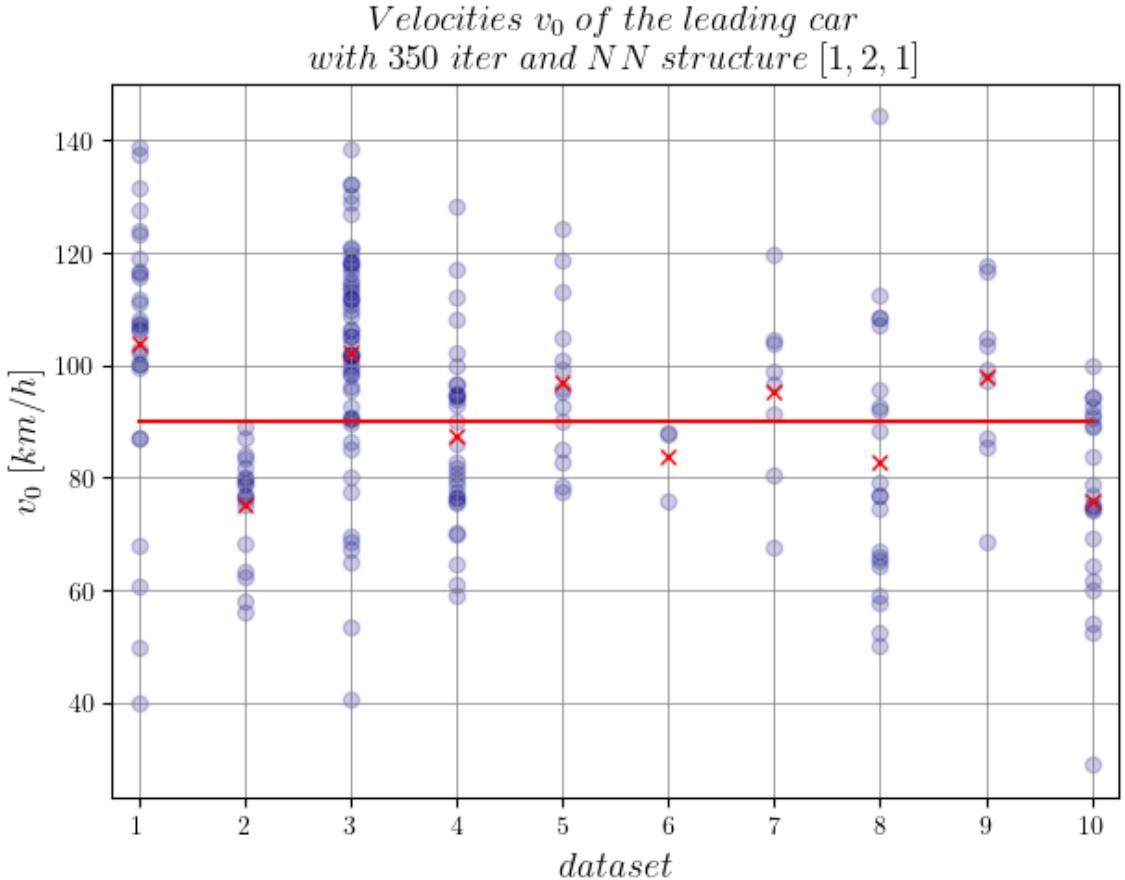
```
In [6]: # To better see scene 6/9 info_dataset
tmp = info_alldataset[err<=0.0001]
info_alldataset = info_alldataset[err>0.0001]
* MAE = 0.1655647084283802
```

## Plot

```
In [7]: # Create the directory..
if flag_save: Time interval n.0: [121.40, 121.60]
    * y_true: [23.88369588 31.34452269]
    ext = ".svg" * v_ann: [27.32489013671875, 25.926368713378906, 2
8.657538135051936]
    df_seen = [df['N. file'][0] for df in dataset]
    df_seen_str = '--'.join(str(x) for x in df_seen)
    # Create time interval n.1: [121.60, 121.80]
    now = datetime.now(): [22.66516063 24.1738881]
    d = now.strftime("%Y-%m-%d %H:%M:%S.%f", {df_1589698791500_ITER6_it
57538135051936])
    path = 'out/' + d
    os.mkdir(path)
    # Save the Time interval n.2: [121.80, 122.00]
    namefile = 'info_alldataset278398686 24.79107704'
    * v_ann: [24.096391677856445, 23.876140594482422, 2
8.657538135051936] + namefile, 'w') as output:
        info_alldataset.to_csv(path + namefile, sep=',', index=False)
```

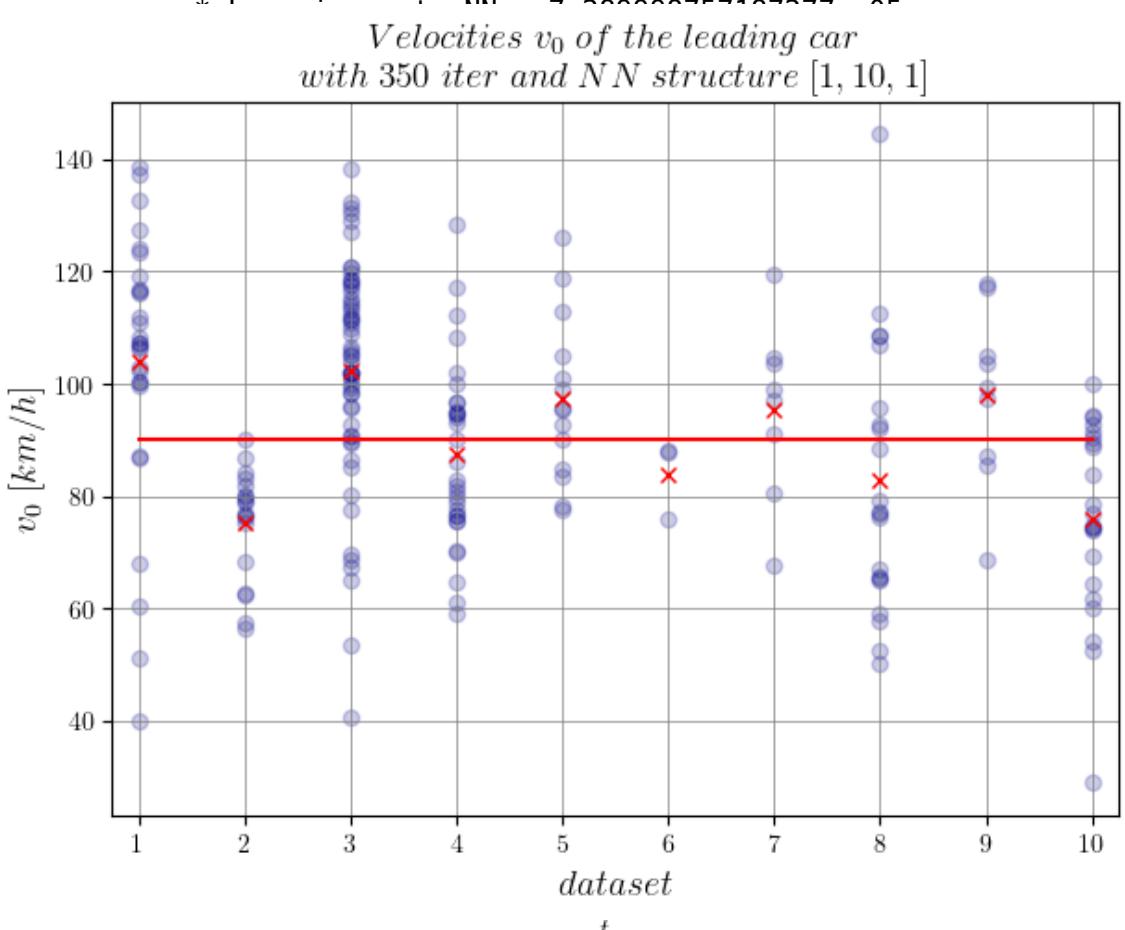
```
In [8]: ms2kmh = 3.6 * err= 0.38191449570178243
          * Learning rate NN = 0.0005904899444431067
          * diff = 0.00040801627817527164
for d in DOE:
    df n. 9 - Scene n. 7, at it = 350
    # Initialize the figure
    width, height = 7, 5
    fig, ax = plt.subplots(figsize=(width,height))
    80
    info_dataset = info_alldataset.loc[info_alldataset['DOE'].isin([0,1,2,3])]
    for _, scn in info_dataset.iterrows():
        # Convert velocities to km/h
        v0_scn_mean_kmh = scn['v0_scn_mean']*ms2kmh
        # For each scene, plot v0 mean (averaging over iterations)
        ax.scatter(scn['N. file'], v0_scn_mean_kmh, alpha = .2, color='blue')
    70
    # For a dataset, plot v0 mean (averaging v0 mean in all the scenes)
    info_grouped = info_dataset.groupby(['N. file']).mean(numeric_only=True)
    for nf, p in info_grouped.iterrows():
        ax.plot(nf, p['v0_scn_mean']*ms2kmh, color = 'r', marker="x")
    60
    # Plot v0 mean over all dfs
    alldfs = [a for a, _ in info_grouped.iterrows()]
    v0_mean_alldfs = info_grouped['v0_scn_mean'].mean()*ms2kmh
    ax.plot(alldfs, [v0_mean_alldfs]*len(alldfs), color = 'r')
    50
    t
    ax.set_xlabel(r"$data\ set$", fontsize=14)
    ax.set_ylabel(r"$v_0\ [km/h]$", fontsize=14)
    ax.set_title(f"NN={NN} with err={err} at it={it}")
    * v0_scn_mean= 28.77259656192382 backslash is interpreted as a
    * MAE = 0.39722042040098ER} \ iter\ and\ NN\ structure\ {str
    =====
    xlim=[0.75,10.25]
    =====
    ax.set_xlim(xlim)
    ax.set_xticks(range(1,11))
    ylim = ax.get_ylim()
    - Time interval n.0: [205.80, 206.00]
    ax.grid(color='grey', linestyle='solid', linewidth=0.5);
    * v_ann: [12.486234664916992, 12.033295631408691, 2
3.158700610445003]

    # Save figure
    if flag_save:
        - Time interval n.1: [206.00, 206.20]
        title = f"v0_{df[1]}_{df[2]}_{df[3]}_{df[4]}_{df[5]}_{df[6]}_{df[7]}_{df[8]}_{df[9]}_{df[10]}_{df[11]}_{df[12]}_{df[13]}_{df[14]}_{df[15]}_{df[16]}_{df[17]}_{df[18]}_{df[19]}_{df[20]}_{df[21]}_{df[22]}_{df[23]}_{df[24]}_{df[25]}_{df[26]}_{df[27]}_{df[28]}_{df[29]}_{df[30]}_{df[31]}_{df[32]}_{df[33]}_{df[34]}_{df[35]}_{df[36]}_{df[37]}_{df[38]}_{df[39]}_{df[40]}_{df[41]}_{df[42]}_{df[43]}_{df[44]}_{df[45]}_{df[46]}_{df[47]}_{df[48]}_{df[49]}_{df[50]}_{df[51]}_{df[52]}_{df[53]}_{df[54]}_{df[55]}_{df[56]}_{df[57]}_{df[58]}_{df[59]}_{df[60]}_{df[61]}_{df[62]}_{df[63]}_{df[64]}_{df[65]}_{df[66]}_{df[67]}_{df[68]}_{df[69]}_{df[70]}_{df[71]}_{df[72]}_{df[73]}_{df[74]}_{df[75]}_{df[76]}_{df[77]}_{df[78]}_{df[79]}_{df[80]}_{df[81]}_{df[82]}_{df[83]}_{df[84]}_{df[85]}_{df[86]}_{df[87]}_{df[88]}_{df[89]}_{df[90]}_{df[91]}_{df[92]}_{df[93]}_{df[94]}_{df[95]}_{df[96]}_{df[97]}_{df[98]}_{df[99]}_{df[100]}_{df[101]}_{df[102]}_{df[103]}_{df[104]}_{df[105]}_{df[106]}_{df[107]}_{df[108]}_{df[109]}_{df[110]}_{df[111]}_{df[112]}_{df[113]}_{df[114]}_{df[115]}_{df[116]}_{df[117]}_{df[118]}_{df[119]}_{df[120]}_{df[121]}_{df[122]}_{df[123]}_{df[124]}_{df[125]}_{df[126]}_{df[127]}_{df[128]}_{df[129]}_{df[130]}_{df[131]}_{df[132]}_{df[133]}_{df[134]}_{df[135]}_{df[136]}_{df[137]}_{df[138]}_{df[139]}_{df[140]}_{df[141]}_{df[142]}_{df[143]}_{df[144]}_{df[145]}_{df[146]}_{df[147]}_{df[148]}_{df[149]}_{df[150]}_{df[151]}_{df[152]}_{df[153]}_{df[154]}_{df[155]}_{df[156]}_{df[157]}_{df[158]}_{df[159]}_{df[160]}_{df[161]}_{df[162]}_{df[163]}_{df[164]}_{df[165]}_{df[166]}_{df[167]}_{df[168]}_{df[169]}_{df[170]}_{df[171]}_{df[172]}_{df[173]}_{df[174]}_{df[175]}_{df[176]}_{df[177]}_{df[178]}_{df[179]}_{df[180]}_{df[181]}_{df[182]}_{df[183]}_{df[184]}_{df[185]}_{df[186]}_{df[187]}_{df[188]}_{df[189]}_{df[190]}_{df[191]}_{df[192]}_{df[193]}_{df[194]}_{df[195]}_{df[196]}_{df[197]}_{df[198]}_{df[199]}_{df[200]}_{df[201]}_{df[202]}_{df[203]}_{df[204]}_{df[205]}_{df[206]}_{df[207]}_{df[208]}_{df[209]}_{df[210]}_{df[211]}_{df[212]}_{df[213]}_{df[214]}_{df[215]}_{df[216]}_{df[217]}_{df[218]}_{df[219]}_{df[220]}_{df[221]}_{df[222]}_{df[223]}_{df[224]}_{df[225]}_{df[226]}_{df[227]}_{df[228]}_{df[229]}_{df[230]}_{df[231]}_{df[232]}_{df[233]}_{df[234]}_{df[235]}_{df[236]}_{df[237]}_{df[238]}_{df[239]}_{df[240]}_{df[241]}_{df[242]}_{df[243]}_{df[244]}_{df[245]}_{df[246]}_{df[247]}_{df[248]}_{df[249]}_{df[250]}_{df[251]}_{df[252]}_{df[253]}_{df[254]}_{df[255]}_{df[256]}_{df[257]}_{df[258]}_{df[259]}_{df[260]}_{df[261]}_{df[262]}_{df[263]}_{df[264]}_{df[265]}_{df[266]}_{df[267]}_{df[268]}_{df[269]}_{df[270]}_{df[271]}_{df[272]}_{df[273]}_{df[274]}_{df[275]}_{df[276]}_{df[277]}_{df[278]}_{df[279]}_{df[280]}_{df[281]}_{df[282]}_{df[283]}_{df[284]}_{df[285]}_{df[286]}_{df[287]}_{df[288]}_{df[289]}_{df[290]}_{df[291]}_{df[292]}_{df[293]}_{df[294]}_{df[295]}_{df[296]}_{df[297]}_{df[298]}_{df[299]}_{df[300]}_{df[301]}_{df[302]}_{df[303]}_{df[304]}_{df[305]}_{df[306]}_{df[307]}_{df[308]}_{df[309]}_{df[310]}_{df[311]}_{df[312]}_{df[313]}_{df[314]}_{df[315]}_{df[316]}_{df[317]}_{df[318]}_{df[319]}_{df[320]}_{df[321]}_{df[322]}_{df[323]}_{df[324]}_{df[325]}_{df[326]}_{df[327]}_{df[328]}_{df[329]}_{df[330]}_{df[331]}_{df[332]}_{df[333]}_{df[334]}_{df[335]}_{df[336]}_{df[337]}_{df[338]}_{df[339]}_{df[340]}_{df[341]}_{df[342]}_{df[343]}_{df[344]}_{df[345]}_{df[346]}_{df[347]}_{df[348]}_{df[349]}_{df[350]}_{df[351]}_{df[352]}_{df[353]}_{df[354]}_{df[355]}_{df[356]}_{df[357]}_{df[358]}_{df[359]}_{df[360]}_{df[361]}_{df[362]}_{df[363]}_{df[364]}_{df[365]}_{df[366]}_{df[367]}_{df[368]}_{df[369]}_{df[370]}_{df[371]}_{df[372]}_{df[373]}_{df[374]}_{df[375]}_{df[376]}_{df[377]}_{df[378]}_{df[379]}_{df[380]}_{df[381]}_{df[382]}_{df[383]}_{df[384]}_{df[385]}_{df[386]}_{df[387]}_{df[388]}_{df[389]}_{df[390]}_{df[391]}_{df[392]}_{df[393]}_{df[394]}_{df[395]}_{df[396]}_{df[397]}_{df[398]}_{df[399]}_{df[400]}_{df[401]}_{df[402]}_{df[403]}_{df[404]}_{df[405]}_{df[406]}_{df[407]}_{df[408]}_{df[409]}_{df[410]}_{df[411]}_{df[412]}_{df[413]}_{df[414]}_{df[415]}_{df[416]}_{df[417]}_{df[418]}_{df[419]}_{df[420]}_{df[421]}_{df[422]}_{df[423]}_{df[424]}_{df[425]}_{df[426]}_{df[427]}_{df[428]}_{df[429]}_{df[430]}_{df[431]}_{df[432]}_{df[433]}_{df[434]}_{df[435]}_{df[436]}_{df[437]}_{df[438]}_{df[439]}_{df[440]}_{df[441]}_{df[442]}_{df[443]}_{df[444]}_{df[445]}_{df[446]}_{df[447]}_{df[448]}_{df[449]}_{df[450]}_{df[451]}_{df[452]}_{df[453]}_{df[454]}_{df[455]}_{df[456]}_{df[457]}_{df[458]}_{df[459]}_{df[460]}_{df[461]}_{df[462]}_{df[463]}_{df[464]}_{df[465]}_{df[466]}_{df[467]}_{df[468]}_{df[469]}_{df[470]}_{df[471]}_{df[472]}_{df[473]}_{df[474]}_{df[475]}_{df[476]}_{df[477]}_{df[478]}_{df[479]}_{df[480]}_{df[481]}_{df[482]}_{df[483]}_{df[484]}_{df[485]}_{df[486]}_{df[487]}_{df[488]}_{df[489]}_{df[490]}_{df[491]}_{df[492]}_{df[493]}_{df[494]}_{df[495]}_{df[496]}_{df[497]}_{df[498]}_{df[499]}_{df[500]}_{df[501]}_{df[502]}_{df[503]}_{df[504]}_{df[505]}_{df[506]}_{df[507]}_{df[508]}_{df[509]}_{df[510]}_{df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```



9.708857945830378]

\* err= 0.4646843208710638



**Plot together**

For scene 0/22  
 \* use LR\_NN=0.0001 with err=2.7699323012935295 at it=19  
 \* v0\_scn\_mean = 20.590881224393677  
 \* MAE = 0.4646843208710638

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- Time interval n.0: [71.72, 71.92]  
 \* y\_true: [25.44045996 0.68637625]  
 \* v\_ann: [15.317845344543457, 16.844135284423828, 2  
 4.696218424736607]

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- Time interval n.1: [71.92, 72.12]  
 \* y\_true: [ 7.65710886 16.8398502 ]  
 \* v\_ann: [12.552390098571777, 19.907947540283203, 2  
 4.696218424736607]

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- Time interval n.2: [72.12, 72.32]  
 \* y\_true: [ 0.68637625 22.9307169 ]  
 \* v\_ann: [13.389259338378906, 20.059329986572266, 2  
 4.696218424736607]

---

- Time interval n.3: [72.32, 72.52]

```
In [9]: # define subplot
width, height = 7, 5
nfig = len(DOE)

fig, axes = plt.subplots(nrows=1, ncols=nfig, figsize = (width*nfig, height))
plt.subplots_adjust(hspace=0.4)
# suptitle = fr"${Velocities}\ v_0 [km/h] of the leading car, using \ {NN\ structure\} \ {d}$"
# suptitle = fr"${Velocities}\ v_0 [km/h] of the leading car, using \ {NN\ structure\} \ {d}$", fontsize=30, y=1.075)

ms2kmh = 3.6

for ax, d in zip(axes.ravel(), nfig):
    # get the right df
    v_0_mean_kmh = info_alldataset[info_alldataset['DOE'].isin([d])].v0_mean_kmh
    v_0_mean_kmh = v_0_mean_kmh.mean() * ms2kmh

    # For each scene, plot v0 mean (averaging over iterations)
    ax.scatter(scn['N. file'], v_0_mean_kmh, alpha = .2, color='blue')

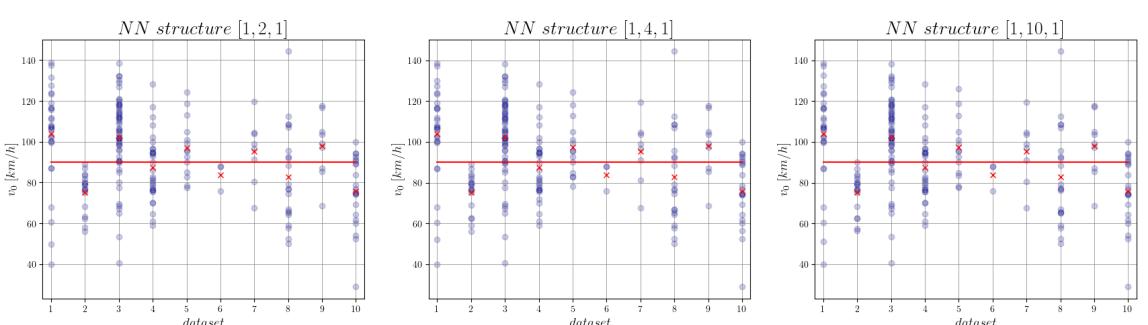
    # For a dataset, plot v0 mean (averaging v0 mean in all the scenes)
    info_grouped = info_alldataset.groupby(['N. file']).mean(numeric_only=True)
    for nf, p in info_grouped.iterrows():
        ax.plot(nf, p['v0_mean'], v0_mean_kmh, color = 'r', marker="x")

    # Plot v0 mean over all dfs
    alldfs = [a for a, _ in info_grouped.iterrows()]
    v0_mean_alldfs = info_grouped['v0_mean'].mean() * ms2kmh
    ax.plot(alldfs, [v0_mean_alldfs]*len(alldfs), color = 'r')

    ax.set_xlabel(r"$data\ set$", fontsize=14)
    ax.set_ylabel(r"$v_0 [km/h]$", fontsize=14)
    ax.set_title(fr"${NN}\ structure\ {d}$", fontsize=20)

    # Limits
    xlim = [0.75,10.25]
    ax.set_xlim(xlim)
    ax.set_xticks(range(1,11))
    ylim = ax.get_ylim()
    ax.grid(color='grey', linestyle='--', linewidth=0.5);

plt.show()
```



\* MAE = 2.964864729266875

In [10]: # Save figure

```
if ftag_save:
    title = f"/v0_df{df_seen_str}_{NUM_ITER}it_NN-ALL"
    fig.savefig(path+title+ext, bbox_inches='tight')
    - Time interval n.0: [120.92, 121.12]
    * y_true: [2.40007998 4.01291198]
    * v_ann: [7.110115051269531, 6.616662502288818, 19.
```

**Plot comparing** 875509421847788]

```
- Time interval n.1: [121.12, 121.32]
* y_true: [3.94779745 3.96114827]
* v_ann: [6.967652320861816, 7.819773197174072, 19.
```

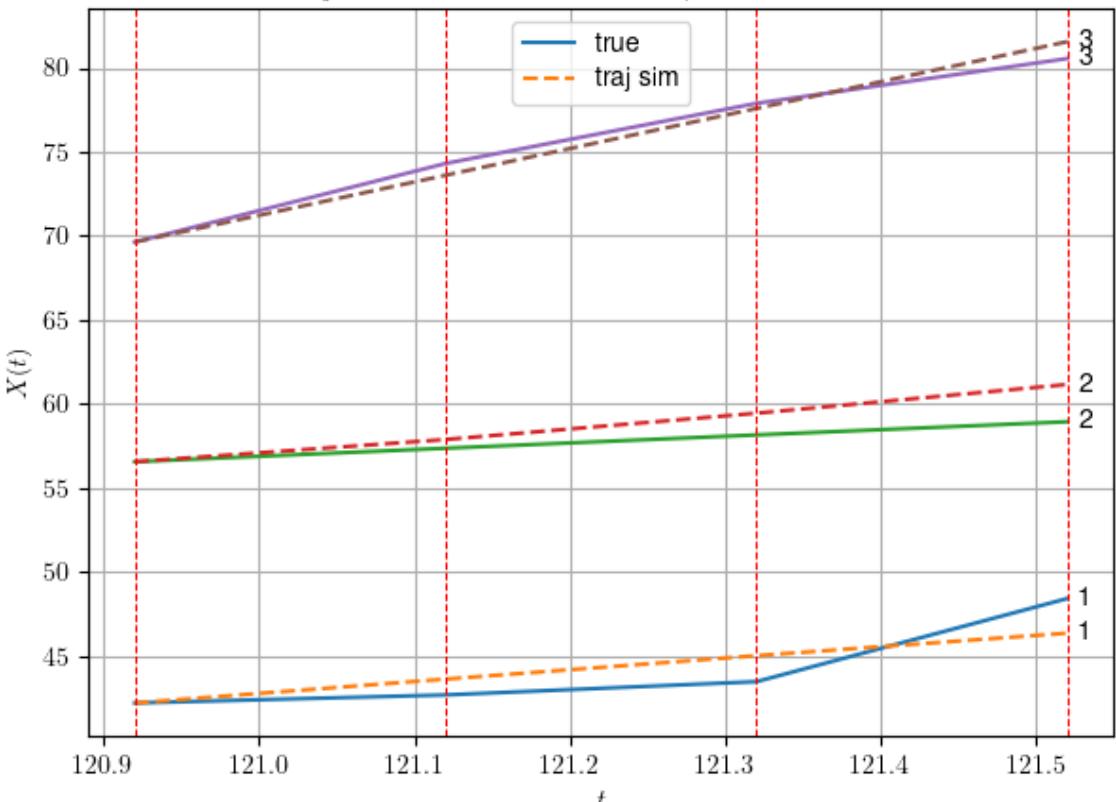
875509421847788]

```
- Time interval n.2: [121.32, 121.52]
* y_true: [24.74097787 3.92663913]
* v_ann: [6.702147483825684, 8.554563522338867, 19.
```

875509421847788]

```
* err= 1.332238143636409
* Learning rate NN = 5.904899080633186e-05
* diff = 0.0008069656926172897
```

df n. 10 – Scene n. 2, at it = 350



For scene 2/22

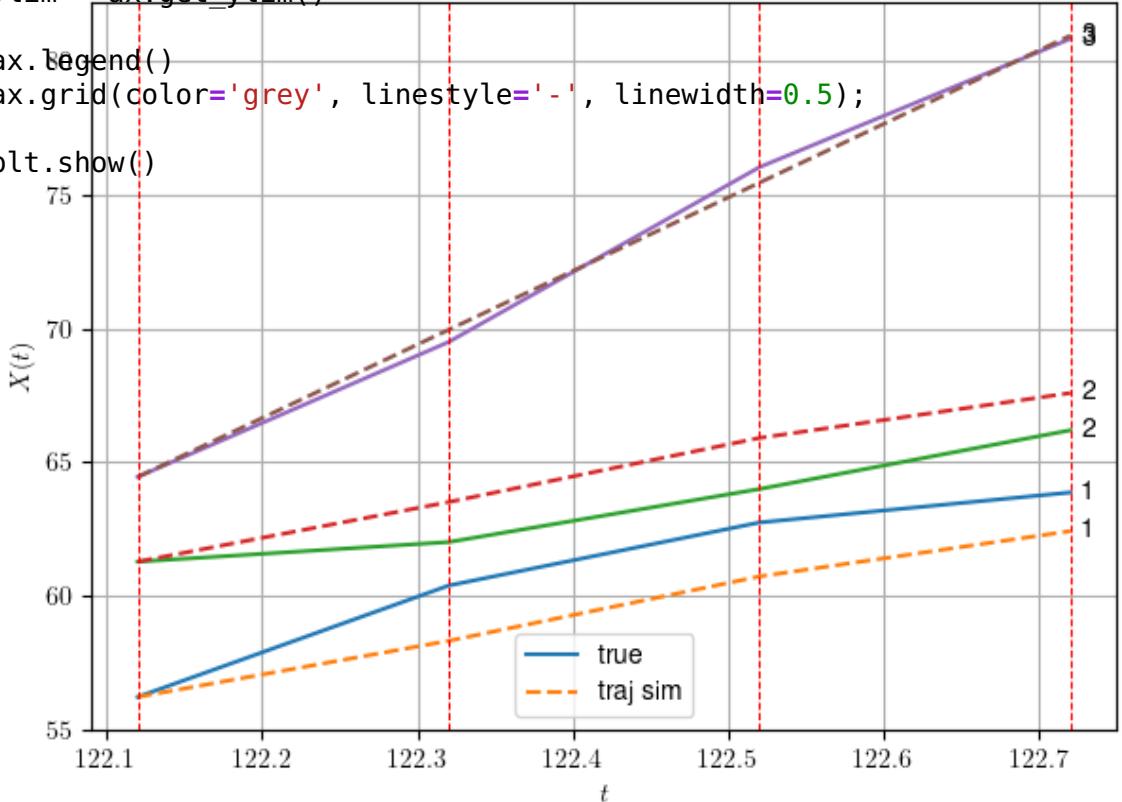
```
* use LR_NN=0.0001 with err=6.5410675730950265 at it=19
* v0_scn_mean = 20.743249496420695
```

```
In [11]: # Initialize the figure
width, height = 7, 5
fig, ax = plt.subplots(figsize=(width, height))

ms2kmh = 3.6

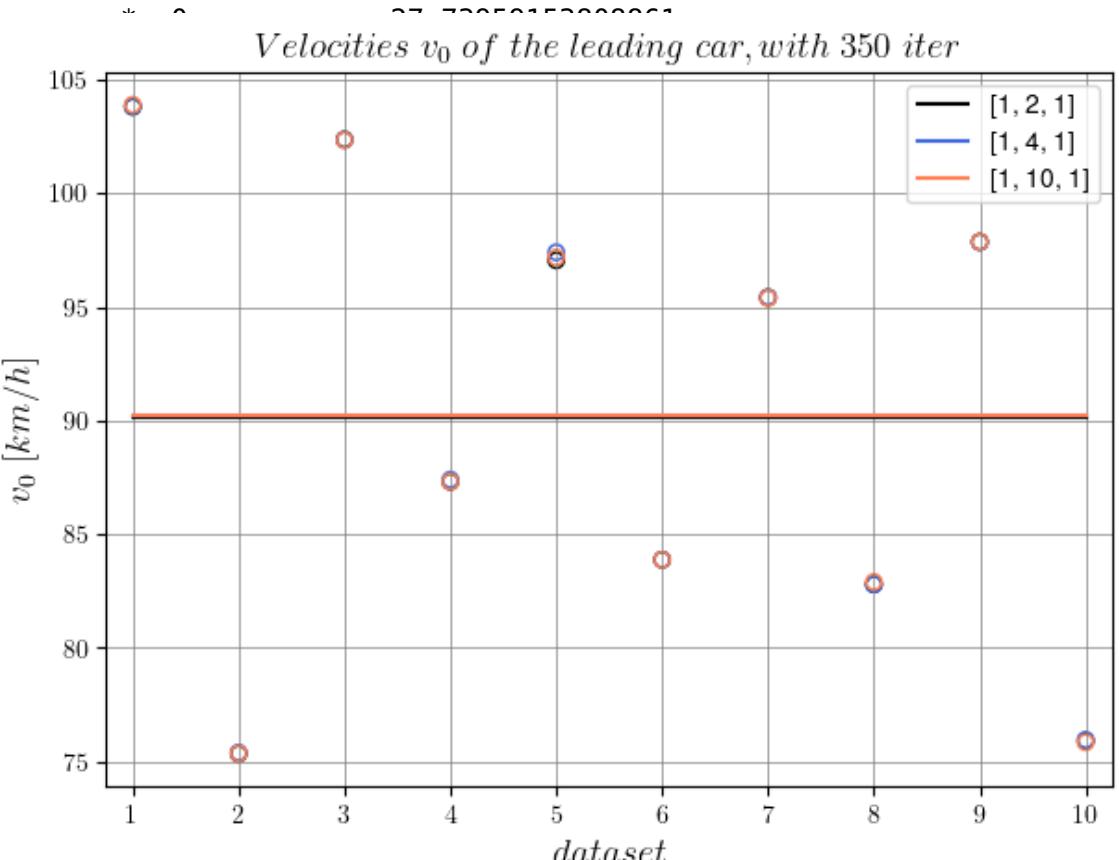
# Time interval n.0: [122.12, 122.32]
palette = ['black', 'royalblue', 'coral']
y_true = [20.84138029, 3.6661027]
* v_0_mean: [10.495810508728027, 11.152395248413086, 2
for step in enumerate(DOE):

    # get the right df
    info_dataset = info_alldataset.loc[info_alldataset['DOE'].isin([0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 789, 790, 791, 792, 793, 794, 795, 796, 797, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 809, 810, 811, 812, 813, 814, 815, 816, 817, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 889, 890, 891, 892, 893, 894, 895, 896, 897, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 989, 990, 991, 992, 993, 994, 995, 996, 997, 997, 998, 999, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1097, 1098, 1099, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1197, 1198, 1199, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1276, 1277, 1278, 1279, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1297, 1298, 1299, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1378, 1379, 1380, 1381, 1381, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1397, 1398, 1399, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1478, 1479, 1480, 1481, 1481, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1497, 1498, 1499, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1578, 1579, 1580, 1581, 1581, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1597, 1598, 1599, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1678, 1679, 1680, 1681, 1681, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1697, 1698, 1699, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1778, 1779, 1780, 1781, 1781, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1797, 1798, 1799, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1878, 1879, 1880, 1881, 1881, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1897, 1898, 1899, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1978, 1979, 1980, 1981, 1981, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1997, 1998, 1999, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2008, 2009, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008
```



For scene 3/22

\* use LR NN=0.01 with err=2.4727108792253745 at it=19



```
In [12]: # Save figure
if flag_save:
    err= 0.15653582804450963
    * Learning rate NN = 5.904899080633186e-05
    title = f"/v0_df{df_seen_str} {NUM_ITER}iter_NN-ALL-comparing"
    fig.savefig(path+title, bbox_inches='tight')
```







































