

[illegible]

[illegible]

```
File ~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/utils.py", line 7, in <module>
    from torchdiffeq import odeint_adjoint as odeint
ModuleNotFoundError: No module named 'torchdiffeq'
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
Traceback (most recent call last):
  File ~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/run_train.py", line 12, in <module>
    from torchdiffeq import odeint_adjoint as odeint
ModuleNotFoundError: No module named 'torchdiffeq'
Traceback (most recent call last):
  File ~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/run_predict.py", line 8, in <module>
    import utils
  File ~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/utils.py", line 7, in <module>
    from torchdiffeq import odeint_adjoint as odeint
ModuleNotFoundError: No module named 'torchdiffeq'
^C
(base) rishabhgoel@GEnIEs-MacBook-Pro ~ % pip3 install torchdiffeq
Collecting torchdiffeq
  Downloading torchdiffeq-0.2.3-py3-none-any.whl (31 kB)
Requirement already satisfied: scipy>=1.4.0 in ./opt/anaconda3/lib/python3.9/site-packages (from torchdiffeq) (1.7.3)
Requirement already satisfied: torch>=1.3.0 in ./opt/anaconda3/lib/python3.9/site-packages (from torchdiffeq) (1.11.0)
Requirement already satisfied: numpy<1.23.0, >=1.16.5 in ./opt/anaconda3/lib/python3.9/site-packages (from scipy>=1.4.0->torchdiffeq) (1.21.5)
Requirement already satisfied: typing-extensions in ./opt/anaconda3/lib/python3.9/site-packages (from torch>=1.3.0->torchdiffeq) (4.3.0)
Installing collected packages: torchdiffeq
Successfully installed torchdiffeq-0.2.3
(base) rishabhgoel@GEnIEs-MacBook-Pro ~ % sh ~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/run.sh
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
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~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/run_train.py
~/Users/rishabhgoel/Desktop/SupplementaryCode/Sfold_models/Neural-ODE/run_train.py --fold 1 --model 1 --save fold_1 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:25<00:00, 7.821it/s]
tensor([ 0.2262,  5.2315,  8.9786,  9.3791, 13.8919, 13.3213, 13.5220, 17.2931,
        17.4456], grad_fn=<IndexBackward0>)
tensor([ 5.8156,  0.8816, 16.1310,  0.8871, 19.8420,  3.7824,  0.8870, 20.1590,
        5.8156])

Epoch 0001 | Training loss 26.023924 | Training R2 -0.761777 | Validation loss 27.338227 | Validation R2 -1.235341
Best loss 27.338227 | Best epoch 0001

100%##### 672/672 [01:26<00:00, 7.791it/s]
tensor([4.6908,  9.7601,  9.8749,  9.9733], grad_fn=<IndexBackward0>)
tensor([ 0.4385, 64.0190, 10.8380, 2.4664])

Epoch 0002 | Training loss 26.732929 | Training R2 -0.859082 | Validation loss 28.909950 | Validation R2 -1.501221
Best loss 27.338227 | Best epoch 0001

100%##### 672/672 [01:25<00:00, 7.871it/s]
tensor([ 6.3561, 10.0968, 10.1091, 10.1211], grad_fn=<IndexBackward0>)
tensor([ 2.0670, 51.9320, 15.5760,  5.7433])

Epoch 0003 | Training loss 25.917587 | Training R2 -0.747408 | Validation loss 27.648657 | Validation R2 -1.287733
Best loss 27.338227 | Best epoch 0001

100%##### 672/672 [01:25<00:00, 7.851it/s]
tensor([ 7.4450, 10.5858, 10.4464, 10.3043], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2848, 2.9028])

Epoch 0004 | Training loss 24.462358 | Training R2 -0.556689 | Validation loss 25.198891 | Validation R2 -0.900291
Best loss 25.198891 | Best epoch 0004

100%##### 672/672 [01:30<00:00, 7.421it/s]
tensor([13.0975, 17.3474, 16.9537, 16.0470, 20.1991, 19.5002, 17.5652, 21.7773,
        20.6730, 18.5450, 22.9046, 21.6300, 19.2130, 23.4309, 22.0190],
        grad_fn=<IndexBackward0>)
tensor([21.5630, 60.7860, 21.2220,  3.9105, 61.5820, 21.8290,  4.0223, 60.9300,
        21.6020,  3.9807, 62.4120, 22.1240,  4.0767, 60.9140, 21.5630])

Epoch 0005 | Training loss 21.083540 | Training R2 -0.156358 | Validation loss 24.022093 | Validation R2 -0.726947
Best loss 24.022093 | Best epoch 0005

100%##### 672/672 [01:26<00:00, 7.771it/s]
tensor([13.8988, 19.9455, 19.2749], grad_fn=<IndexBackward0>)
tensor([ 4.7871, 64.0020, 17.1420])

Epoch 0006 | Training loss 19.201651 | Training R2 0.040059 | Validation loss 18.415304 | Validation R2 -0.014881
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:26<00:00, 7.771it/s]
tensor([3.8838,  9.2432,  7.8896], grad_fn=<IndexBackward0>)
tensor([2.0948,  9.5297,  2.0948])

Epoch 0007 | Training loss 20.586771 | Training R2 -0.102500 | Validation loss 24.883312 | Validation R2 -0.852993
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:26<00:00, 7.781it/s]
tensor([14.1825, 24.6263, 22.8973, 21.0740], grad_fn=<IndexBackward0>)
tensor([ 5.7740, 65.1420, 19.1070,  6.7725])

Epoch 0008 | Training loss 19.861233 | Training R2 -0.026166 | Validation loss 24.477762 | Validation R2 -0.793005
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.631it/s]
tensor([ 7.3886, 15.2852, 15.0051, 14.7217, 13.5519, 12.6374, 11.4696,  9.7745,
        16.5592, 14.6723, 12.6844], grad_fn=<IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5500, 17.5020,  6.4361,  3.8432,  1.1209,  0.2506,
        39.4790,  6.4477,  1.1231])

Epoch 0009 | Training loss 19.403126 | Training R2 0.020626 | Validation loss 24.256100 | Validation R2 -0.760757
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:26<00:00, 7.741it/s]
tensor([10.1602, 17.5999, 15.7106, 13.1961, 11.3136, 10.0193, 13.6939],
        grad_fn=<IndexBackward0>)
tensor([ 4.1260, 46.3510, 12.0230,  2.1373,  0.5852,  9.7076,  4.1260])

Epoch 0010 | Training loss 19.002797 | Training R2 -0.020137 | Validation loss 26.300607 | Validation R2 -1.071348
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:27<00:00, 7.651it/s]
tensor([17.6132, 29.0599, 27.0050, 23.1010,  31.0644, 29.0502, 25.1802, 31.9336,
        29.0707, 26.0100, 32.3000, 29.9340, 26.2629], grad_fn=<IndexBackward0>)
tensor([16.3500, 60.8840, 20.3170,  2.9673, 63.1460, 21.1430,  3.0879, 62.4000,
        20.9200,  3.0565, 61.7290, 17.8350,  3.0201])

Epoch 0011 | Training loss 18.058519 | Training R2 0.151661 | Validation loss 20.707491 | Validation R2 -0.283253
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:26<00:00, 7.741it/s]
tensor([15.4383, 24.8883, 22.1746], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0012 | Training loss 17.740986 | Training R2 0.181232 | Validation loss 19.841864 | Validation R2 -0.170209
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:27<00:00, 7.711it/s]
tensor([ 6.3241, 12.5770,  7.8696, 12.4096,  8.1072, 14.2149,  7.8223, 11.2600,
        7.1939, 10.3775,  6.3101,  9.3190,  5.2160, 10.8303,  8.0949,  3.9391,
        9.5000,  6.7120,  3.4917,  5.1752,  0.0802,  6.3916,  3.4053,  0.0772,
        4.6115,  1.6545, -2.7077,  2.6072, -0.3233, -4.8436,  0.6210, -2.4424,
        -7.0419, -1.5844, -4.7004, -9.3002], grad_fn=<IndexBackward0>)
tensor([ 4.3672, 20.9330,  4.1252, 20.0940,  4.3540, 69.3090,  4.3603, 22.1610,
        4.3672, 22.1610,  4.3672, 22.1610,  4.3672, 73.7310, 22.1640,  4.3670,
        73.7110, 22.1610,  4.3672, 22.1610,  4.3672, 73.7440, 22.1650,  4.3681,
        73.7110, 22.1610,  4.3672, 73.7100, 22.1610,  4.3672, 73.7100, 22.1610,
        4.3672, 73.7100, 22.1610,  4.3672])

Epoch 0013 | Training loss 17.646467 | Training R2 0.189933 | Validation loss 19.356730 | Validation R2 -0.121299
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:27<00:00, 7.641it/s]
tensor([ 1.6994, 17.4405, 13.2031, 11.1923, 10.0834, 20.9034, 10.0324, 16.0101,
        15.2050, 23.9429, 21.1202, 19.7191, 17.9639, 25.3072, 23.1900, 20.2907],
        grad_fn=<IndexBackward0>)
tensor([ 0.7604, 22.7900,  2.1049,  0.8118,  0.5042, 22.8300,  5.4673,  0.8133,
        0.5051, 20.9070,  4.3000,  1.6610,  0.5051, 21.5700,  5.1656,  0.7604])

Epoch 0014 | Training loss 17.502306 | Training R2 0.203115 | Validation loss 19.610004 | Validation R2 -0.150834
```


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100%##### 672/672 [01:25:00:00, 7.821t/s]
tensor([4.6988, 9.7681, 9.8749, 9.9733], grad_fn=<IndexBackward0>)
tensor([0.4385, 64.0190, 10.8380, 2.4664])

Epoch 0002 | Training loss 26.732929 | Training R2 -0.859082 | Validation loss 28.909950 | Validation R2 -1.501221
Best loss 27.330227 | Best epoch 0001

100%##### 672/672 [01:26:00:00, 7.771t/s]
tensor([6.3561, 10.0968, 10.1091, 10.1211], grad_fn=<IndexBackward0>)
tensor([2.0678, 51.9320, 15.5760, 5.7433])

Epoch 0003 | Training loss 25.917587 | Training R2 -0.747408 | Validation loss 27.640657 | Validation R2 -1.207733
Best loss 27.330227 | Best epoch 0001

100%##### 672/672 [01:26:00:00, 7.811t/s]
tensor([7.4450, 10.5858, 10.4464, 10.3043], grad_fn=<IndexBackward0>)
tensor([3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0004 | Training loss 24.462358 | Training R2 -0.556689 | Validation loss 25.198891 | Validation R2 -0.900291
Best loss 25.198891 | Best epoch 0004

100%##### 672/672 [01:26:00:00, 7.761t/s]
tensor([13.0975, 17.3474, 16.9537, 16.0470, 20.1991, 19.5002, 17.5652, 21.7773,
20.6730, 18.5450, 22.0946, 21.6300, 19.2130, 23.4309, 22.0190],
grad_fn=<IndexBackward0>)
tensor([21.5630, 60.7860, 21.2220, 3.9105, 61.5820, 21.8290, 4.0223, 60.9380,
21.6020, 3.9007, 62.4120, 22.1240, 4.0767, 60.9140, 21.5630])

Epoch 0005 | Training loss 21.003540 | Training R2 -0.156350 | Validation loss 24.022093 | Validation R2 -0.726947
Best loss 24.022093 | Best epoch 0005

100%##### 672/672 [01:26:00:00, 7.731t/s]
tensor([13.8988, 19.9455, 19.2749], grad_fn=<IndexBackward0>)
tensor([4.7071, 64.0020, 17.1420])

Epoch 0006 | Training loss 19.201651 | Training R2 0.040059 | Validation loss 18.415304 | Validation R2 -0.014081
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:29:00:00, 7.471t/s]
tensor([3.8838, 9.2432, 7.8096], grad_fn=<IndexBackward0>)
tensor([2.0940, 9.5297, 2.0940])

Epoch 0007 | Training loss 20.586771 | Training R2 -0.102500 | Validation loss 24.883312 | Validation R2 -0.852993
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:27:00:00, 7.711t/s]
tensor([14.1025, 24.6263, 22.0973, 21.0740], grad_fn=<IndexBackward0>)
tensor([5.7740, 65.1420, 19.1070, 6.7725])

Epoch 0008 | Training loss 19.861233 | Training R2 -0.026166 | Validation loss 24.477762 | Validation R2 -0.793085
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:26:00:00, 7.721t/s]
tensor([7.3080, 15.2052, 15.0051, 14.7217, 13.5519, 12.6374, 11.4696, 9.7745,
16.5502, 14.6723, 12.6844], grad_fn=<IndexBackward0>)
tensor([0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1200, 0.2500,
39.4790, 6.4477, 1.1231])

Epoch 0009 | Training loss 19.403126 | Training R2 0.020626 | Validation loss 24.256100 | Validation R2 -0.760757
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:28:00:00, 7.591t/s]
tensor([10.1602, 17.5999, 15.7100, 13.1961, 11.3136, 15.0193, 13.6939],
grad_fn=<IndexBackward0>)
tensor([4.1260, 46.3510, 12.0230, 2.1373, 0.5052, 9.7076, 4.1260])

Epoch 0010 | Training loss 19.002797 | Training R2 -0.020137 | Validation loss 26.300607 | Validation R2 -1.071348
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:29:00:00, 7.501t/s]
tensor([17.6132, 29.0599, 27.0050, 23.1010, 31.0044, 29.0050, 25.1002, 31.9336,
29.0707, 26.0100, 32.3000, 29.9340, 26.2629], grad_fn=<IndexBackward0>)
tensor([16.3500, 60.0040, 20.3170, 2.9673, 63.1460, 21.1430, 3.0079, 62.4000,
20.9200, 3.0050, 61.7290, 17.0300, 3.0201])

Epoch 0011 | Training loss 18.005819 | Training R2 0.156161 | Validation loss 20.707491 | Validation R2 -0.203253
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:29:00:00, 7.551t/s]
tensor([15.4303, 24.0000, 22.1746], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0012 | Training loss 17.740906 | Training R2 0.181232 | Validation loss 19.841064 | Validation R2 -0.170209
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:28:00:00, 7.501t/s]
tensor([6.3241, 12.5770, 7.0096, 12.4096, 8.1072, 14.2149, 7.0223, 11.2600,
7.1939, 10.3775, 6.3101, 9.3190, 5.2160, 10.0300, 0.0049, 3.9391,
9.0000, 6.7100, 4.0017, 5.1750, 0.0042, 6.3916, 3.4000, -0.0772,
4.0115, 1.6545, -2.7077, 2.6072, -0.3233, -4.0436, 0.0210, -2.4424,
-7.0419, -1.5044, -4.7004, -9.3002], grad_fn=<IndexBackward0>)
tensor([4.3672, 20.9300, 22.0040, 4.3600, 59.0090, 4.3603, 22.1610,
4.3672, 22.1610, 4.3672, 22.1610, 4.3672, 73.7310, 22.1640, 4.3670,
73.7110, 22.1610, 4.3672, 22.1610, 4.3672, 73.7440, 22.1650, 4.3601,
73.7110, 22.1610, 4.3672, 73.7100, 22.1610, 4.3672, 73.7100, 22.1610,
4.3672, 73.7100, 22.1610, 4.3672])

Epoch 0013 | Training loss 17.646467 | Training R2 0.109933 | Validation loss 19.356730 | Validation R2 -0.121299
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:28:00:00, 7.611t/s]
tensor([1.4994, 17.4400, 13.2031, 11.1923, 10.2004, 20.0004, 10.0004, 10.0004,
15.2036, 23.9429, 21.1242, 19.7191, 17.9639, 25.3072, 23.1000, 20.2007],
grad_fn=<IndexBackward0>)
tensor([0.7004, 22.7000, 2.1000, 0.0110, 0.0042, 22.0000, 5.4073, 0.0133,
0.0001, 20.0000, 4.3000, 3.6010, 0.0001, 21.0000, 5.1000, 0.7004])

Epoch 0014 | Training loss 17.502306 | Training R2 0.203115 | Validation loss 19.610004 | Validation R2 -0.150034
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:31:00:00, 7.321t/s]
tensor([11.4615, 22.3707, 10.7000, 12.3394, 19.1679, 15.6442, 9.1946],
grad_fn=<IndexBackward0>)
tensor([5.5479, 51.0750, 15.0000, 2.3393, 50.7150, 15.6200, 2.3116])

Epoch 0015 | Training loss 18.001534 | Training R2 0.157006 | Validation loss 23.457544 | Validation R2 -0.646730
Best loss 18.415304 | Best epoch 0006

100%##### 672/672 [01:32:00:00, 7.301t/s]
tensor([26.0042, 36.4665, 34.4420, 31.6990], grad_fn=<IndexBackward0>)
tensor([40.1440, 50.7900, 7.5200, 1.1600])

Epoch 0016 | Training loss 17.815072 | Training R2 0.174305 | Validation loss 16.533590 | Validation R2 0.101920
Best loss 16.533590 | Best epoch 0016

100%##### 672/672 [01:31:00:00, 7.331t/s]
tensor([20.0729, 27.1115, 26.0057, 26.2577, 25.0270, 24.5116, 29.1032, 27.9320,
26.0042, 31.0047, 29.7046, 20.5277, 31.9410, 30.2244, 33.5430, 31.7003,
35.0000, 33.2931, 34.6410, 34.7019, 30.0724, 36.1795, 39.4200, 37.4934,
40.0000, 30.7079, 41.0000, 39.0000, 42.0000, 40.0000],
grad_fn=<IndexBackward0>)
tensor([30.1730, 32.4920, 24.0420, 20.1000, 16.9010, 11.5390, 42.3070, 24.3350,
16.9000, 47.3100, 27.9000, 19.6030, 34.2530, 30.0700, 35.0040, 21.5240,
35.5990, 21.0790, 36.1540, 22.2220, 36.2500, 22.3030, 36.3190, 22.3450,
36.2250, 22.2940, 36.0000, 22.1040, 35.9000, 22.1450])

Epoch 0017 | Training loss 16.692785 | Training R2 0.275125 | Validation loss 17.940970 | Validation R2 0.035067
Best loss 16.533590 | Best epoch 0016

100%##### 672/672 [01:41:00:00, 6.631t/s]
tensor([11.4724, 10.0004, 17.5307, 16.9000, 16.3923, 14.5437, 10.0000, 17.0257,
16.2227, 20.4424, 17.4939, 21.3679, 10.0000, 22.2140, 19.3035, 23.0034,
20.1774, 23.7139, 20.0700, 24.3030, 21.0000, 25.0210, 22.1001],
grad_fn=<IndexBackward0>)
tensor([21.3340, 19.2010, 14.4950, 11.2260, 0.9500, 5.3001, 10.6970, 12.5000,
0.2540, 26.5910, 10.1200, 20.1000, 11.3300, 19.3320, 12.1200, 30.0000,
12.6640, 30.4370, 12.9750, 30.7340, 13.1000, 30.9300, 13.3310])

Epoch 0018 | Training loss 16.660076 | Training R2 0.277374 | Validation loss 15.139571 | Validation R2 0.314063
Best loss 15.139571 | Best epoch 0018

100%##### 672/672 [01:49:00:00, 6.111t/s]
tensor([9.6000, 0.0000, 0.9571, 10.1170, 13.7020], grad_fn=<IndexBackward0>)
tensor([12.0470, 12.0000, 1.0025, 53.5000, 12.0470])

Epoch 0019 | Training loss 14.477341 | Training R2 0.454766 | Validation loss 13.607776 | Validation R2 0.445044
Best loss 13.607776 | Best epoch 0019

100%##### 672/672 [02:03:00:00, 5.431t/s]
tensor([9.4000, 30.0040, 2.2007, 11.5110, 9.2951], grad_fn=<IndexBackward0>)
tensor([2.7000, 66.9500, 2.7495, 2.3342, 2.7000])

Epoch 0020 | Training loss 14.510922 | Training R2 0.452234 | Validation loss 16.010000 | Validation R2 0.154337
Best loss 13.607776 | Best epoch 0019

100%##### 672/672 [02:24:00:00, 4.641t/s]
tensor([8.5300, 33.0000, 10.0000, 7.7000, 27.9494, 10.0000, 7.0000, 27.0000,
15.7736, 7.0000, 27.7991, 14.5402, 7.1510, 27.0000, 15.6676, 7.2000,
27.0000, 15.0000, 7.2429, 27.0000, 15.0000, 7.2000, 15.0000, 15.0000,
7.2000, 27.2736, 27.2736, 15.0000, 7.2000, 27.2736, 7.2000, 27.2736,
16.0000, 7.4791], grad_fn=<IndexBackward0>)
tensor([2.9463, 47.9160, 16.0000, 2.7000, 51.2510, 15.3770, 2.9173, 52.0000,
10.1500, 2.9979, 52.0000, 15.0000, 2.9900, 51.0000, 17.0000, 2.9402,
52.2210, 10.0000, 2.9745, 52.2510, 10.0000, 2.9704, 50.5100, 15.0000,
3.3002, 2.0000, 17.0000, 17.0000, 2.9464, 50.0000, 2.0000, 17.0000,
17.0000, 2.9463])

Epoch 0021 | Training loss 11.205000 | Training R2 0.673339 | Validation loss 10.361195 | Validation R2 0.670725
Best loss 10.361195 | Best epoch 0021

```
100%##### 672/672 [02:36<00:00, 4.281t/s]
tensor([ 7.2399, 32.7656, 15.4638, 8.0082, 6.8111, 5.5762, 17.2878, 7.8300,
         5.4728, 15.2754, 7.4841, 5.4436, 5.2924], grad_fn=IndexBackward0)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
         1.7166, 17.7690, 5.9424, 1.9898, 1.7819])

Epoch 0022 | Training loss 9.869438 | Training R2 0.746610 | Validation loss 9.603258 | Validation R2 0.724009
Best loss 9.603258 | Best epoch 0022

100%##### 672/672 [02:32<00:00, 4.391t/s]
tensor([15.8579, 50.2009, 26.6418, 14.6086, 46.3771, 24.7828, 14.7037, 46.6151,
         14.9483, 46.6064, 25.1501, 15.1815, 46.7168, 25.3345, 15.4380, 46.7163,
         25.5262, 15.7424, 47.2646, 25.5042, 15.9307, 47.3325, 25.6759, 16.1516,
         25.6520, 16.3157, 47.7276, 26.3268, 16.6276, 48.0387, 26.6325],
        grad_fn=IndexBackward0)
tensor([19.8480, 53.1950, 18.5150, 3.2922, 56.7650, 19.9680, 3.5586, 57.2050,
         3.5796, 56.8250, 19.9970, 3.5558, 56.6830, 19.9170, 3.5416, 56.1670,
         19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.8470, 3.5291,
         19.8520, 3.5300, 56.3440, 19.8300, 3.5261, 56.4400, 19.8400])

Epoch 0023 | Training loss 8.880115 | Training R2 0.794864 | Validation loss 7.997626 | Validation R2 0.808583
Best loss 7.997626 | Best epoch 0023

100%##### 672/672 [02:30<00:00, 4.481t/s]
tensor([17.2749, 69.2989, 34.9108, 18.0886, 29.8557, 17.5402, 65.0494, 31.9385,
         17.1070], grad_fn=IndexBackward0)
tensor([20.1800, 76.4000, 23.3070, 3.2060, 20.8640, 3.3441, 78.0070, 24.2140,
         3.3317])

Epoch 0024 | Training loss 7.985860 | Training R2 0.834099 | Validation loss 8.102264 | Validation R2 0.803542
Best loss 7.997626 | Best epoch 0023

100%##### 672/672 [02:29<00:00, 4.491t/s]
tensor([11.3186, 17.6525, 7.2354, 5.7471, 42.5767, 15.1930, 9.6660, 6.2997,
         5.1429, 14.7872, 5.7812, 4.6024], grad_fn=IndexBackward0)
tensor([17.2550, 16.6050, 5.5696, 2.1836, 53.8670, 17.2450, 18.7980, 5.7840,
         2.2677, 17.4600, 5.8590, 2.2971])

Epoch 0025 | Training loss 8.279782 | Training R2 0.821662 | Validation loss 9.688253 | Validation R2 0.719102
Best loss 7.997626 | Best epoch 0023

100%##### 672/672 [02:44<00:00, 4.091t/s]
tensor([15.5552, 19.4323, 8.8080, 49.8646, 19.4493, 8.6966,
         19.4075, 8.7385, 58.9847, 17.1765, 8.8072, 19.3949, 8.6471, 19.4621,
         8.3514, 19.4284, 8.7043, 7.9715, 19.3271, 7.7307, 19.0096, 7.5651,
         31.6473, 13.4030, 7.0181, 21.1455], grad_fn=IndexBackward0)
tensor([23.4920, 20.2570, 7.0773, 21.0300, 2.8637, 78.1770, 21.8200, 2.8620,
         21.0260, 2.8620, 70.1760, 18.0350, 2.8620, 21.0280, 2.8623, 21.0310,
         2.8627, 21.0320, 4.5357, 2.8628, 21.0320, 2.8627, 20.7940, 2.8304,
         37.6000, 12.7810, 2.7564, 23.5920])

Epoch 0026 | Training loss 6.741351 | Training R2 0.881778 | Validation loss 6.505997 | Validation R2 0.873327
Best loss 6.505997 | Best epoch 0026

100%##### 672/672 [02:48<00:00, 3.991t/s]
tensor([ 6.7332, 80.9639, 29.2549, 11.5219, 8.3984, 20.1279, 7.6323, 57.2668,
         22.6112, 8.8510, 6.5861, 63.7430, 5.7285], grad_fn=IndexBackward0)
tensor([ 6.1430, 77.5400, 24.0970, 7.7805, 2.9525, 17.9790, 3.0428, 55.8410,
         21.1480, 6.8284, 3.0454, 63.6220, 2.9330])

Epoch 0027 | Training loss 7.444011 | Training R2 0.855848 | Validation loss 8.489068 | Validation R2 0.784336
Best loss 6.505997 | Best epoch 0026

100%##### 672/672 [02:47<00:00, 4.011t/s]
tensor([ 7.7094, 43.7068, 36.5667, 25.8860, 12.6556, 7.2692, 4.5190, 3.7489,
         36.6624, 10.6850, 4.4337, 3.8561, 36.7842, 10.8842, 4.6113, 3.9674],
        grad_fn=IndexBackward0)
tensor([12.5050, 42.8500, 34.8410, 24.5230, 12.4040, 7.4428, 3.7669, 1.3563,
         42.1990, 12.2400, 3.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3385])

Epoch 0028 | Training loss 6.370688 | Training R2 0.894421 | Validation loss 5.628891 | Validation R2 0.905179
Best loss 5.628891 | Best epoch 0028

100%##### 672/672 [02:59<00:00, 3.751t/s]
tensor([ 3.2122, 45.6662, 11.4265, 2.6867], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0029 | Training loss 6.405765 | Training R2 0.893255 | Validation loss 6.673342 | Validation R2 0.866726
Best loss 5.628891 | Best epoch 0028

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 1 --model 2 --save_fold 1 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:25<00:00, 7.611t/s]
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
         1.7166])

Epoch 0001 | Training loss 24.396061 | Training R2 -0.611271 | Validation loss 29.565437 | Validation R2 -1.135200
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.601t/s]
tensor([ 4.5860, 7.7243, 7.7542, 7.7692, 7.8141, 10.7971, 10.8420,
         10.8070, 13.8650, 13.9107, 13.9557, 16.8932, 16.9082, 16.9831, 19.9356,
         20.0105, 22.9630, 23.0379, 26.0379, 28.9479, 29.0378, 31.9629, 32.0378,
         34.8608, 34.9417, 37.7557, 37.8000], grad_fn=IndexBackward0)
tensor([12.5700, 31.8440, 25.2520, 20.7450, 17.3800, 10.5840, 40.6700, 22.8730,
         13.7690, 43.5540, 24.6480, 15.0630, 44.8460, 35.6960, 15.2700, 35.8460,
         15.3380, 35.0950, 15.3590, 15.2690, 43.9280, 15.2390, 35.5910, 15.2300,
         34.7690, 14.8850, 42.5800, 12.5700])

Epoch 0002 | Training loss 25.662014 | Training R2 -0.782833 | Validation loss 33.517910 | Validation R2 -1.744252
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.631t/s]
tensor([5.6275, 8.0024, 8.7686], grad_fn=IndexBackward0)
tensor([ 2.9348, 49.9070, 2.9348])

Epoch 0003 | Training loss 24.307240 | Training R2 -0.599560 | Validation loss 31.725683 | Validation R2 -1.458023
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.581t/s]
tensor([ 7.0766, 10.0451, 9.7717, 9.5309, 9.2409, 11.8985, 11.5903, 11.2770,
         11.0037], grad_fn=IndexBackward0)
tensor([ 0.7450, 40.8200, 9.9731, 3.1421, 0.8166, 40.8800, 10.0110, 2.6018,
         0.8197])

Epoch 0004 | Training loss 19.475636 | Training R2 -0.026863 | Validation loss 22.108311 | Validation R2 -0.193936
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.491t/s]
tensor([15.8276, 23.3258, 22.6143], grad_fn=IndexBackward0)
tensor([19.2920, 85.6310, 19.2920])

Epoch 0005 | Training loss 20.458645 | Training R2 -0.133138 | Validation loss 24.160664 | Validation R2 -0.425895
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.531t/s]
tensor([ 9.2572, 13.8954, 12.9740], grad_fn=IndexBackward0)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0006 | Training loss 17.644037 | Training R2 0.157199 | Validation loss 18.924053 | Validation R2 0.125221
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:30<00:00, 7.461t/s]
tensor([ 6.5554, 14.4303, 14.2323, 14.0333, 13.2285, 12.6145, 11.7006, 11.1425],
        grad_fn=IndexBackward0)
tensor([ 1.0703, 24.1700, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0007 | Training loss 17.723608 | Training R2 0.149580 | Validation loss 19.722084 | Validation R2 0.049886
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.481t/s]
tensor([17.9146, 20.9030, 27.0520, 23.5514, 30.4000, 20.1000, 23.7917, 29.1836,
         26.5059, 21.4609, 25.4309, 22.4455, 17.6895, 16.8178, 19.2722],
        grad_fn=IndexBackward0)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4800, 19.8330, 2.0444, 57.7000,
         16.2300, 1.6730, 44.0250, 12.3930, 1.8120, 1.2775, 17.6690])

Epoch 0008 | Training loss 16.884079 | Training R2 0.228237 | Validation loss 18.234676 | Validation R2 0.187794
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.471t/s]
tensor([17.3961, 35.1640, 32.7303], grad_fn=IndexBackward0)
tensor([ 7.2340, 79.9040, 30.3950])

Epoch 0009 | Training loss 17.505775 | Training R2 0.189205 | Validation loss 20.149847 | Validation R2 0.008224
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.471t/s]
```



```
tensor([ 0.9194, 2.6580, 2.2602, 1.8612, 1.4610, -0.2532, -1.1996, -1.9260,
        -2.2793], grad_fn=<IndexBackward0>)
tensor([0.3554, 5.3208, 4.0322, 3.2185, 2.6321, 1.2520, 0.7242, 0.3492, 0.2020])

Epoch 0010 | Training loss 16.073269 | Training R2 0.300581 | Validation loss 18.079575 | Validation R2 0.201553
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:32<00:00, 7.261t/s]
tensor([21.2469, 44.4680, 39.3766, 29.7086, 36.6719, 24.5128],
        grad_fn=<IndexBackward0>)
tensor([20.1800, 76.4080, 23.3070, 3.2069, 20.8640, 3.3441])

Epoch 0011 | Training loss 16.631909 | Training R2 0.251111 | Validation loss 19.968565 | Validation R2 0.025990
Best loss 18.079575 | Best epoch 0010

31%##### | 209/672 [00:28<00:59, 7.821t/s] 31%##### | 209/672 [00:29<01:05, 7.061t/s]
Traceback (most recent call last):
  File "/Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/run_train.py", line 94, in <module>
    loss.backward()
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torch/_tensor.py", line 363, in backward
    torch.autograd.backward(self, gradient, retain_graph, create_graph, inputs=inputs)
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torch/autograd/__init__.py", line 173, in backward
    Variable._execution_engine.run_backward( # Calls into the C++ engine to run the backward pass
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torch/autograd/function.py", line 253, in apply
    return user_fn(self, args)
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/adjoint.py", line 126, in backward
    adj_state = odeint(
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/odeint.py", line 77, in odeint
    solution = solver.integrate(t)
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/solvers.py", line 30, in integrate
    solution[i] = self.advance(t[i])
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/rk_common.py", line 194, in advance
    self.rk_state = self._adaptive_step(self.rk_state)
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/rk_common.py", line 255, in _adaptive_step
    y1, f1, y1_error, k = _runge_kutta_step(self.func, y0, f0, t0, dt, t1, tableau=self.tableau)
  File "/Users/rishabhgoel/opt/anaconda3/lib/python3.9/site-packages/torchdiffeq/_impl/rk_common.py", line 75, in _runge_kutta_step
    y1 = y0 + torch.sum(k[1..., :i + 1] * (beta_i * dt), dim=-1).view_as(f0)
KeyboardInterrupt

(base) rishabhgoel@GeniF5-MacBook-Pro ~ % sh /Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/run.sh
/Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper/Supplementary_Code/f5fold_models/Neural-ODE/run_train.py --fold 1 --model 1 --save_fold 1 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:29<00:00, 7.531t/s]
tensor([ 0.8659, 3.9561, 4.3489, 6.9639, 7.3885, 9.9335, 10.2554, 12.8904,
        13.2394], grad_fn=<IndexBackward0>)
tensor([ 2.9329, 18.1390, 2.8114, 19.1060, 2.9618, 16.6620, 2.9542, 19.3020,
        2.9922])

Epoch 0001 | Training loss 24.626810 | Training R2 -0.641895 | Validation loss 30.045382 | Validation R2 -1.205005
Best loss 30.045382 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.401t/s]
tensor([4.6080, 9.5966, 9.7043, 9.7965], grad_fn=<IndexBackward0>)
tensor([ 0.4305, 64.0100, 10.8300, 2.4644])

Epoch 0002 | Training loss 25.603544 | Training R2 -0.774718 | Validation loss 33.331497 | Validation R2 -1.713811
Best loss 30.045382 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.431t/s]
tensor([ 6.3645, 10.0221, 10.0221, 10.0219, 10.0214], grad_fn=<IndexBackward0>)
tensor([ 2.0678, 51.9320, 15.5760, 5.7433])

Epoch 0003 | Training loss 24.660084 | Training R2 -0.646335 | Validation loss 32.330074 | Validation R2 -1.554455
Best loss 30.045382 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.421t/s]
tensor([ 7.5779, 10.7335, 10.5503, 10.3672], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0004 | Training loss 22.553848 | Training R2 -0.377116 | Validation loss 29.115191 | Validation R2 -1.070662
Best loss 29.115191 | Best epoch 0004

100%##### 672/672 [01:30<00:00, 7.451t/s]
tensor([ 9.4674, 12.0900, 12.3135, 11.0211, 14.3069, 13.7451, 12.2600,
        12.0065, 15.4448, 14.5974, 12.6249, 16.0483, 14.8118, 12.0713,
        16.2488, 15.0254, 12.6046, 15.9901, 14.5864, 11.8602, 15.3394,
        13.7079, 10.6946, 14.2434, 12.4934, 8.9465, 11.1621, 0.7167,
        6.5010, 8.0216, 6.4207, 3.5933, 5.7097, -0.2020, 1.9313,
        -1.2142, -4.9775, -2.8409, -6.3531, -10.4847, -0.4183, -12.7790],
        grad_fn=<IndexBackward0>)
tensor([ 7.3608, 43.7330, 14.9210, 2.7685, 45.9550, 10.0700, 3.8155, 2.9446,
        46.1300, 10.1450, 2.9568, 46.7250, 14.1790, 2.9953, 45.9900, 15.0060,
        2.9515, 45.0260, 15.7550, 2.9235, 46.3120, 16.0030, 2.9695, 46.4360,
        16.0330, 2.9750, 20.4610, 7.2470, 2.9262, 12.0770, 0.4900, 2.0144,
        20.5900, 2.9448, 20.6570, 0.3285, 2.9543, 20.5540, 0.2870, 2.9396,
        20.0050, 7.3688])

Epoch 0005 | Training loss 24.629457 | Training R2 -0.642248 | Validation loss 31.366308 | Validation R2 -1.403238
Best loss 29.115191 | Best epoch 0004

100%##### 672/672 [01:31<00:00, 7.311t/s]
tensor([13.7938, 19.5351, 18.6905], grad_fn=<IndexBackward0>)
tensor([ 4.7871, 64.0020, 17.1420])

Epoch 0006 | Training loss 19.594009 | Training R2 -0.039383 | Validation loss 22.387205 | Validation R2 -0.224249
Best loss 22.387205 | Best epoch 0006

100%##### 672/672 [01:30<00:00, 7.461t/s]
tensor([13.5974, 22.0083, 20.7167, 18.2056, 24.3761, 22.8267, 19.9298],
        grad_fn=<IndexBackward0>)
tensor([ 7.3120, 00.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2978])

Epoch 0007 | Training loss 21.656366 | Training R2 -0.269690 | Validation loss 25.066343 | Validation R2 -0.634331
Best loss 22.387205 | Best epoch 0006

100%##### 672/672 [01:30<00:00, 7.461t/s]
tensor([13.7767, 25.6110, 24.0069, 22.4042], grad_fn=<IndexBackward0>)
tensor([ 5.7740, 05.1420, 19.1070, 6.7725])

Epoch 0008 | Training loss 19.049363 | Training R2 -0.066651 | Validation loss 22.911612 | Validation R2 -0.202275
Best loss 22.387205 | Best epoch 0006

100%##### 672/672 [01:32<00:00, 7.281t/s]
tensor([ 6.9208, 16.1840, 15.0807, 15.5901, 14.3781, 13.4506, 12.1771, 10.2585,
        17.0040, 15.0144, 13.7203], grad_fn=<IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
        39.4790, 6.4477, 1.1231])

Epoch 0009 | Training loss 19.794535 | Training R2 -0.060766 | Validation loss 23.140764 | Validation R2 -0.308957
Best loss 22.387205 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.491t/s]
tensor([1.2596, 6.9730, 6.5930, 3.0516, 1.6130], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.0730, 0.0292, 0.1817])

Epoch 0010 | Training loss 18.974268 | Training R2 0.025326 | Validation loss 22.211109 | Validation R2 -0.205065
Best loss 22.211109 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.421t/s]
tensor([18.5466, 29.4055, 26.0004, 21.3966, 29.5490, 26.6150, 21.1492, 18.1922,
        19.0624, 25.7390, 22.5225, 18.2763], grad_fn=<IndexBackward0>)
tensor([19.0400, 53.1000, 10.5150, 3.2922, 56.7650, 19.9600, 3.5506, 57.2050,
        3.6796, 56.0250, 19.9970, 3.5558])

Epoch 0011 | Training loss 17.096495 | Training R2 0.208696 | Validation loss 19.218676 | Validation R2 0.097771
Best loss 19.218676 | Best epoch 0011

100%##### 672/672 [01:29<00:00, 7.491t/s]
tensor([16.9351, 27.4040, 23.4701], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0012 | Training loss 16.420110 | Training R2 0.269358 | Validation loss 18.505262 | Validation R2 0.163511
Best loss 18.505262 | Best epoch 0012

100%##### 672/672 [01:30<00:00, 7.421t/s]
tensor([ 9.0728, 15.0824, 8.6026, 13.2544, 8.0806, 11.0249, 0.8372, 11.6379,
        9.4149, 9.0428, 12.0295, 9.4390, 9.0559, 12.1067, 9.2367, 8.0324,
        11.6083, 8.0106, 0.3951, 11.1735, 8.2062, 7.7652, 10.4920, 7.4105,
        6.9010, 9.3914, 4.4726, 6.0017, 0.6402], grad_fn=<IndexBackward0>)
tensor([15.0300, 13.0430, 1.2600, 15.9120, 1.2850, 11.0900, 1.0720, 11.0400,
        1.5299, 1.0679, 10.0290, 1.5298, 1.0679, 10.0520, 1.5296, 1.0678,
        15.0300, 1.5299, 1.0679, 15.0320, 1.5301, 1.0601, 15.0290, 1.5298,
        1.0679, 13.2230, 1.5298, 1.0679, 15.0300])

Epoch 0013 | Training loss 15.320640 | Training R2 0.364547 | Validation loss 16.943941 | Validation R2 0.290708
Best loss 16.943941 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.501t/s]
tensor([17.4992, 45.5940, 37.4352, 29.7296, 23.43574, 40.6114, 39.0724, 29.9042,
        23.3031, 32.9127, 26.3422, 22.5437, 35.1450, 29.7150, 26.0430, 23.3049],
        grad_fn=<IndexBackward0>)
```

```
tensor([ 8.4611, 79.6090, 23.5290,  8.0412,  3.2043, 82.3550, 24.5250,  7.1901,
         3.3400, 24.4960,  8.3718,  3.3360, 83.7380, 24.9400,  8.5236,  3.3965])

Epoch 0014 | Training loss 14.304376 | Training R2 0.446055 | Validation loss 15.995668 | Validation R2 0.375008
Best loss 15.995668 | Best epoch 0014

100%##### 672/672 [01:32<00:00,  7.261t/s]
tensor([11.5216, 25.9536, 18.7742,  4.3684, 18.6990,  9.7573,  0.1605],
       grad_fn=IndexBackward0)
tensor([ 5.1847, 45.5960, 16.0720,  1.9627, 47.0920, 14.8530,  2.0373])

Epoch 0015 | Training loss 13.305818 | Training R2 0.520695 | Validation loss 15.527839 | Validation R2 0.411032
Best loss 15.527839 | Best epoch 0015

100%##### 672/672 [01:34<00:00,  7.141t/s]
tensor([28.4883, 51.7386, 40.8246, 30.6043], grad_fn=IndexBackward0)
tensor([48.1440, 50.7900,  7.5206,  1.1606])

Epoch 0016 | Training loss 12.541238 | Training R2 0.574196 | Validation loss 15.046682 | Validation R2 0.446966
Best loss 15.046682 | Best epoch 0016

100%##### 672/672 [01:35<00:00,  7.041t/s]
tensor([11.2521, 19.5203, 17.8567, 16.2123, 11.8429, 21.2629, 16.0014, 10.8904,
        19.3963, 14.2469, 10.8912, 16.2660, 11.3552, 15.9629, 11.2363, 16.5931,
        11.3656, 15.1527, 11.4783, 15.1492, 11.6536, 11.6942, 13.7656, 11.8604,
        13.7768, 11.9242, 13.7843, 11.9470], grad_fn=IndexBackward0)
tensor([19.6520, 16.4460, 14.1650, 12.2100,  7.0450, 26.0250, 16.5200, 10.6130,
        28.4130, 10.0610, 11.5900, 25.6080, 11.9480, 25.6080, 12.2220, 29.0010,
        12.1700, 25.3340, 12.0950, 25.5170, 12.1820, 12.4030, 19.4300, 12.4020,
        19.2730, 12.3760, 19.1570, 12.3010])

Epoch 0017 | Training loss 11.577513 | Training R2 0.637123 | Validation loss 13.753815 | Validation R2 0.537921
Best loss 13.753815 | Best epoch 0017

100%##### 672/672 [01:38<00:00,  6.811t/s]
tensor([10.4185, 26.7618, 24.2714, 21.8491, 19.4927, 13.1182, 24.9644, 19.7197,
        13.2779, 25.1034, 14.6586, 24.7908, 15.1336, 24.5942, 15.2684, 24.3810,
        15.0033, 24.1127, 14.4023, 23.7379, 14.2094, 23.2903, 14.0403],
       grad_fn=IndexBackward0)
tensor([21.3340, 19.2610, 14.4950, 11.2260,  8.9585,  5.3801, 10.6970, 12.5000,
        8.2540, 26.5910, 10.1200, 20.1900, 11.3200, 19.3320, 12.1200, 30.0900,
        12.6640, 30.4370, 12.9750, 30.7340, 13.1890, 30.9350, 13.3310])

Epoch 0018 | Training loss 11.267155 | Training R2 0.656317 | Validation loss 12.282238 | Validation R2 0.631511
Best loss 12.282238 | Best epoch 0018

100%##### 672/672 [02:00<00:00,  5.501t/s]
tensor([20.1693, 56.7647, 27.7900,  7.9118, 40.6500, 21.2197,  7.8509, 37.9460,
        21.1882,  8.0083, 38.2978, 21.6058,  9.4654], grad_fn=IndexBackward0)
tensor([21.5630, 60.7860, 21.2220,  3.9105, 61.5820, 21.8290,  4.0223, 60.9300,
        21.6020,  3.9007, 62.4120, 22.1240,  4.0767])

Epoch 0019 | Training loss 9.092960 | Training R2 0.776159 | Validation loss 10.566298 | Validation R2 0.727281
Best loss 10.566298 | Best epoch 0019

100%##### 672/672 [02:19<00:00,  4.821t/s]
tensor([ 9.1025, 45.4023, 15.0747,  1.2969, 33.6044, 13.7062,  2.0902, 32.2529,
        15.0544,  3.1009, 32.0395, 14.4372], grad_fn=IndexBackward0)
tensor([ 4.9161, 42.0730,  5.4509, 60.7050, 39.7010,  5.1625,  0.1270, 30.5530,
        6.6617,  0.1233, 37.8370,  4.9161])

Epoch 0020 | Training loss 8.390466 | Training R2 0.809409 | Validation loss 10.254351 | Validation R2 0.743146
Best loss 10.254351 | Best epoch 0020

100%##### 672/672 [02:33<00:00,  4.381t/s]
tensor([ 2.7823, -0.7012, 16.7425,  0.1005, 19.9626,  5.2998,  1.0183, 21.2979,
        0.5926], grad_fn=IndexBackward0)
tensor([ 5.0160,  0.0010, 16.1310,  0.0071, 19.0420,  3.7024,  0.0070, 20.1590,
        5.0156])

Epoch 0021 | Training loss 7.370070 | Training R2 0.852947 | Validation loss 8.416509 | Validation R2 0.826965
Best loss 8.416509 | Best epoch 0021

100%##### 672/672 [02:37<00:00,  4.271t/s]
tensor([ 7.4921, 42.0310,  1.1003,  0.0237,  0.5000, 17.6342,  0.0240,
        1.1199, 14.8636,  4.2910,  1.0074,  1.7715], grad_fn=IndexBackward0)
tensor([ 7.2829, 42.8440, 12.3400,  4.1313,  1.6174,  1.6724, 20.9970,  5.9940,
        1.7160, 17.7690,  5.9424,  1.9090,  1.7019])

Epoch 0022 | Training loss 6.769789 | Training R2 0.875926 | Validation loss 6.859765 | Validation R2 0.885055
Best loss 6.859765 | Best epoch 0022

100%##### 672/672 [02:52<00:00,  3.911t/s]
tensor([11.5659, 52.0529, 15.9928,  4.2202, 45.0372, 15.4206,  4.4164, 43.9275,
        4.6320, 43.0027, 16.6005,  4.0007, 43.6431, 15.4003,  4.0999, 43.0073,
        15.1669,  4.7064, 41.0940, 14.7135,  4.0360,  6.5062,  4.7093, 54.0776,
        0.0003], grad_fn=IndexBackward0)
tensor([10.1490, 53.5670, 17.9020,  3.4007, 56.5400, 19.1720,  3.6506, 55.0710,
        3.6166, 56.0030, 19.0010,  3.0290, 56.0930, 19.0000,  3.6005, 55.6130,
        10.9050,  3.5990, 54.6240, 10.5710,  3.5362,  7.7903,  3.6241, 73.1600,
        10.1490])

Epoch 0023 | Training loss 6.361078 | Training R2 0.890455 | Validation loss 6.279366 | Validation R2 0.903603
Best loss 6.279366 | Best epoch 0023

100%##### 672/672 [02:51<00:00,  3.921t/s]
tensor([14.5146, 54.0734, 10.1540,  7.6142, 40.1451, 10.0057],
       grad_fn=IndexBackward0)
tensor([20.1600, 53.7010, 10.0000,  3.5221, 56.3060, 20.1600])

Epoch 0024 | Training loss 6.199807 | Training R2 0.895940 | Validation loss 6.439827 | Validation R2 0.898690
Best loss 6.279366 | Best epoch 0023

100%##### 672/672 [02:51<00:00,  3.921t/s]
tensor([10.2017, 10.5346,  7.6956,  5.7072, 45.1900, 10.6995, 12.0322,  8.4170,
        6.6132, 19.3536,  0.3001,  6.0100], grad_fn=IndexBackward0)
tensor([17.2550, 16.0050,  5.5696,  2.1036, 53.0670, 17.2450, 10.7900,  5.7040,
        2.2677, 17.4600,  5.0590,  2.2971])

Epoch 0025 | Training loss 6.253183 | Training R2 0.894140 | Validation loss 6.411709 | Validation R2 0.899570
Best loss 6.279366 | Best epoch 0023

100%##### 672/672 [02:45<00:00,  4.051t/s]
tensor([ 0.6411, 49.0276, 13.4753,  3.0070, 44.4376,  3.0360, 15.4121,  3.5914,
        2.9302, 15.4405,  2.0476, 10.0007,  3.0012,  2.7151, 15.4002,  4.9066,
        2.6273,  5.0200,  2.6703,  2.4007,  5.0406,  2.4344,  5.3797,  2.2320,
        4.0223], grad_fn=IndexBackward0)
tensor([ 7.7458, 46.1910, 15.0090,  2.9155, 46.0330,  2.9904, 10.0000,  5.5715,
        2.9020, 17.7400,  2.0074, 19.0400,  6.1265,  2.0016, 17.3040,  6.9723,
        2.7906,  7.9412,  3.1075,  2.7979,  7.0285,  2.7501,  7.0213,  2.7556,
        7.7458])

Epoch 0026 | Training loss 5.956546 | Training R2 0.903945 | Validation loss 5.635359 | Validation R2 0.922427
Best loss 5.635359 | Best epoch 0026

100%##### 672/672 [02:50<00:00,  3.941t/s]
tensor([ 4.2635, 45.0121, 11.2596,  1.9525,  0.0344, 44.7441, 12.2073,  2.7000,
        1.7247, 47.7349, 14.0066,  3.9717,  2.5300, 47.3007, 14.7678,  5.1951,
        3.2602], grad_fn=IndexBackward0)
tensor([ 1.6139, 40.1610, 12.3010,  4.1701,  1.6409, 41.0410, 12.7110,  4.2813,
        1.6046, 42.0210, 13.2660,  4.4600,  1.7501, 41.6500, 12.9000,  4.3470,
        1.7100])

Epoch 0027 | Training loss 7.570074 | Training R2 0.844530 | Validation loss 9.629046 | Validation R2 0.773479
Best loss 5.635359 | Best epoch 0026

100%##### 672/672 [02:50<00:00,  3.951t/s]
tensor([ 0.8409, 19.4015, 12.3740, 31.3114, 21.7004], grad_fn=IndexBackward0)
tensor([10.2020, 14.6790,  8.2303, 35.7260, 10.2020])

Epoch 0028 | Training loss 6.503239 | Training R2 0.802670 | Validation loss 6.253000 | Validation R2 0.904472
Best loss 5.635359 | Best epoch 0026

100%##### 672/672 [02:49<00:00,  3.961t/s]
tensor([ 5.0101, 44.7492, 10.0630,  2.3139], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2040,  2.9020])

Epoch 0029 | Training loss 6.611257 | Training R2 0.801669 | Validation loss 7.944351 | Validation R2 0.845035
Best loss 5.635359 | Best epoch 0026

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 1 --model 1 --save fold_1 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:33<00:00,  7.211t/s]
tensor([2.2012, 4.3401, 4.5154, 4.6905, 4.0404, 7.3129, 9.4333, 9.6325, 9.0317],
       grad_fn=IndexBackward0)
tensor([ 7.2029, 42.0440, 12.3400,  4.1313,  1.6174,  1.6724, 20.9970,  5.9940,
        1.7160])

Epoch 0001 | Training loss 24.396061 | Training R2 -0.611271 | Validation loss 29.565437 | Validation R2 -1.135200
Best loss 29.565437 | Best epoch 0001
```

```
100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([ 4.5868, 7.7243, 7.7393, 7.7542, 7.7692, 7.8141, 10.7971, 10.8420,
        10.8070, 13.8650, 13.9107, 13.9557, 16.8932, 16.9082, 16.9831, 19.9356,
        20.8185, 22.9630, 23.8570, 26.8379, 28.9479, 29.8378, 31.9629, 32.8378,
        34.8668, 34.9417, 37.7557, 37.8600], grad_fn=IndexBackward0>)
tensor([12.5700, 31.8440, 25.2520, 20.7650, 17.3880, 10.5840, 40.6760, 22.8730,
        13.9690, 43.5540, 24.6400, 15.0630, 44.8640, 35.6960, 15.2700, 35.8460,
        15.3380, 35.8950, 15.3590, 15.2690, 43.9280, 15.2390, 35.5910, 15.2300,
        34.7690, 14.8850, 42.5860, 12.5700])

Epoch 0002 | Training loss 25.662014 | Training R2 -0.782833 | Validation loss 33.517918 | Validation R2 -1.744252
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:34<00:00, 7.10it/s]
tensor([5.6275, 8.8024, 8.7686], grad_fn=IndexBackward0>)
tensor([ 2.9348, 49.9070, 2.9348])

Epoch 0003 | Training loss 24.307240 | Training R2 -0.599560 | Validation loss 31.725683 | Validation R2 -1.458623
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:33<00:00, 7.18it/s]
tensor([ 7.0766, 10.0451, 9.7717, 9.5309, 9.2409, 11.8905, 11.5903, 11.2770,
        11.0037], grad_fn=IndexBackward0>)
tensor([ 0.7450, 40.8280, 9.9731, 3.1421, 0.8166, 40.8800, 10.0110, 2.6018,
        0.8197])

Epoch 0004 | Training loss 19.475436 | Training R2 -0.026863 | Validation loss 22.106311 | Validation R2 -0.193936
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:35<00:00, 7.01it/s]
tensor([15.8276, 23.3258, 22.2343], grad_fn=IndexBackward0>)
tensor([19.2920, 85.6310, 19.2920])

Epoch 0005 | Training loss 20.450645 | Training R2 -0.133138 | Validation loss 24.160664 | Validation R2 -0.425895
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([ 9.2572, 13.8954, 12.9740], grad_fn=IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0006 | Training loss 17.644037 | Training R2 0.157199 | Validation loss 18.924053 | Validation R2 0.125221
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:33<00:00, 7.18it/s]
tensor([ 6.5554, 14.4303, 14.2323, 14.0333, 13.2285, 12.6145, 11.7806, 11.1425],
        grad_fn=IndexBackward0>)
tensor([ 1.0703, 24.1780, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0007 | Training loss 17.723608 | Training R2 0.149508 | Validation loss 19.722084 | Validation R2 0.049886
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:32<00:00, 7.24it/s]
tensor([17.9146, 28.9038, 27.0520, 23.5514, 30.4003, 28.1000, 23.7917, 29.1836,
        26.5059, 21.4409, 25.4309, 22.4455, 17.6895, 16.8170, 19.2722],
        grad_fn=IndexBackward0>)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4890, 19.8330, 2.0444, 57.7000,
        16.2380, 1.6738, 44.0250, 12.3938, 1.8120, 1.2775, 17.6690])

Epoch 0008 | Training loss 16.884079 | Training R2 0.228237 | Validation loss 18.234676 | Validation R2 0.187794
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:35<00:00, 7.07it/s]
tensor([17.3961, 35.1640, 32.7303], grad_fn=IndexBackward0>)
tensor([ 7.2340, 79.9040, 38.3950])

Epoch 0009 | Training loss 17.305775 | Training R2 0.189205 | Validation loss 20.149847 | Validation R2 0.008224
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:35<00:00, 7.05it/s]
tensor([ 0.9194, 2.6580, 2.2602, 1.8612, 1.4610, -0.2532, -1.1996, -1.9260,
        -2.2793], grad_fn=IndexBackward0>)
tensor([0.3054, 5.3000, 4.0322, 3.2105, 2.6321, 1.2520, 0.7242, 0.3492, 0.2020])

Epoch 0010 | Training loss 16.073269 | Training R2 0.300581 | Validation loss 18.079575 | Validation R2 0.201553
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:33<00:00, 7.18it/s]
tensor([21.2460, 44.4400, 39.3976, 29.7086, 36.6719, 24.5120],
        grad_fn=IndexBackward0>)
tensor([20.1800, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441])

Epoch 0011 | Training loss 16.631989 | Training R2 0.251111 | Validation loss 19.960565 | Validation R2 0.025990
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:31<00:00, 7.37it/s]
tensor([-0.2112, 9.6766, 8.9151, 3.7237, 1.2923], grad_fn=IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0012 | Training loss 16.117798 | Training R2 0.296700 | Validation loss 19.308783 | Validation R2 0.089291
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([ 8.1193, 28.2361, 13.4984], grad_fn=IndexBackward0>)
tensor([ 2.9348, 49.9070, 2.9348])

Epoch 0013 | Training loss 15.069706 | Training R2 0.305193 | Validation loss 17.587860 | Validation R2 0.244393
Best loss 17.587860 | Best epoch 0013

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([28.5283, 47.7753, 46.5215, 45.2703, 44.0218, 39.0541, 35.3557, 30.4402,
        26.0148, 23.1959, 40.9320, 28.8364, 19.7065, 14.5903],
        grad_fn=IndexBackward0>)
tensor([50.4930, 47.4530, 35.8760, 28.7780, 23.7390, 11.0000, 7.0637, 3.5658,
        2.1356, 1.2790, 48.6290, 12.1800, 3.6833, 1.3211])

Epoch 0014 | Training loss 13.840353 | Training R2 0.401411 | Validation loss 15.888102 | Validation R2 0.383385
Best loss 15.888102 | Best epoch 0014

100%##### 672/672 [01:31<00:00, 7.38it/s]
tensor([19.5747, 57.5473, 43.1012, 17.4068, 42.4553, 25.7603, 14.2486, 30.5511,
        15.0762, 24.2100, 19.7464], grad_fn=IndexBackward0>)
tensor([17.5830, 71.0050, 22.2940, 2.9600, 49.2230, 14.1200, 2.9876, 52.3580,
        3.1778, 44.7320, 17.5830])

Epoch 0015 | Training loss 13.451623 | Training R2 0.510133 | Validation loss 15.470939 | Validation R2 0.414735
Best loss 15.470939 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([15.3390, 40.0979, 27.4991, 6.8975, 27.3409, 16.6500],
        grad_fn=IndexBackward0>)
tensor([15.6310, 53.5120, 15.1840, 1.6724, 54.0710, 15.6310])

Epoch 0016 | Training loss 12.981250 | Training R2 0.543793 | Validation loss 14.996788 | Validation R2 0.450628
Best loss 14.996788 | Best epoch 0016

100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([20.6242, 87.1770, 56.6517], grad_fn=IndexBackward0>)
tensor([12.6410, 93.0030, 31.3750])

Epoch 0017 | Training loss 12.344368 | Training R2 0.507459 | Validation loss 14.402932 | Validation R2 0.493276
Best loss 14.402932 | Best epoch 0017

100%##### 672/672 [01:31<00:00, 7.31it/s]
tensor([ 5.8743, 33.4952, 14.7101, 2.2171, -1.6118, -3.1793, 19.0014, 7.9290,
        2.0701, -3.3863, 6.3000, 0.5193, -5.0548], grad_fn=IndexBackward0>)
tensor([ 3.4332, 50.3360, 16.1500, 3.0901, 1.9000, 1.3372, 50.0530, 13.6000,
        5.6217, 1.3536, 19.2430, 5.5348, 1.1154])

Epoch 0018 | Training loss 11.731120 | Training R2 0.627429 | Validation loss 13.635745 | Validation R2 0.545020
Best loss 13.635745 | Best epoch 0018

100%##### 672/672 [01:32<00:00, 7.24it/s]
tensor([ 9.1925, 00.4060, 26.4027, 2.9091, 22.6411, 3.5067, 10.0990, 2.9576,
        16.7243, 2.9704], grad_fn=IndexBackward0>)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0059,
        15.0010, 2.0309])

Epoch 0019 | Training loss 11.256901 | Training R2 0.656943 | Validation loss 13.020782 | Validation R2 0.585063
Best loss 13.020782 | Best epoch 0019

100%##### 672/672 [01:33<00:00, 7.16it/s]
tensor([13.0924, 49.3759, 17.0067, 2.1433, 32.0296, 15.3211, 1.6264],
        grad_fn=IndexBackward0>)
tensor([14.0340, 52.5400, 13.3690, 1.8996, 54.0650, 14.0150, 1.9913])

Epoch 0020 | Training loss 10.260763 | Training R2 0.714638 | Validation loss 12.052997 | Validation R2 0.645138
Best loss 12.052997 | Best epoch 0020

100%##### 672/672 [01:36<00:00, 6.98it/s]
tensor([ 1.2734, 12.2210, -0.0390, 2.7799, 0.0759], grad_fn=IndexBackward0>)
tensor([0.1003, 6.0026, 0.1079, 5.1060, 0.1003])

Epoch 0021 | Training loss 9.360041 | Training R2 0.762411 | Validation loss 10.907734 | Validation R2 0.705092
Best loss 10.907734 | Best epoch 0021

100%##### 672/672 [01:38<00:00, 6.83it/s]
tensor([ 2.0920, 7.5000, -2.5524, 21.9355, 8.0222, 1.5509, -0.0570,
        -1.7677, 0.2143, 4.1000, -1.0009], grad_fn=IndexBackward0>)
tensor([ 3.7604, 12.6090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6054,
        1.9625, 15.0020, 0.0540, 1.9640])

Epoch 0022 | Training loss 8.574100 | Training R2 0.800072 | Validation loss 9.521094 | Validation R2 0.770529
Best loss 9.521094 | Best epoch 0022

100%##### 672/672 [01:43<00:00, 6.48it/s]
tensor([11.0300, 63.7290, 21.1029, 1.9694, 50.4700, 22.5600, 4.1765, 49.5000,
        23.2013, 11.2773, 6.1622], grad_fn=IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2978, 62.7360,
        19.2460, 7.4050, 3.3370])
```

Epoch 0023 | Training loss 8.835385 | Training R2 0.825203 | Validation loss 9.607819 | Validation R2 0.774552
Best loss 9.521894 | Best epoch 0022

100%##### 672/672 [01:59<00:00, 5.64it/s]
tensor([6.3880, 14.1343, 2.3735, 29.4463, 13.7770, 2.6396, 30.1243, 13.3924,
2.9050, 30.8156, 13.5442, 3.0128, 30.5357, 13.4581],
grad_fn=IndexBackward0>)
tensor([9.8032, 9.6259, 0.6383, 43.8578, 9.7842, 0.6435, 44.0790, 9.7534,
0.6467, 44.4320, 9.8362, 0.6522, 44.3840, 9.8032])

Epoch 0024 | Training loss 7.263038 | Training R2 0.857188 | Validation loss 8.324299 | Validation R2 0.830736
Best loss 8.324299 | Best epoch 0024

100%##### 672/672 [02:16<00:00, 4.91it/s]
tensor([26.6158, 57.6124], grad_fn=IndexBackward0>)
tensor([47.8150, 46.8380])

Epoch 0025 | Training loss 6.618134 | Training R2 0.881423 | Validation loss 6.747346 | Validation R2 0.888792
Best loss 6.747346 | Best epoch 0025

100%##### 672/672 [02:25<00:00, 4.62it/s]
tensor([8.1440, 64.3160, 18.0991, 0.7626, 17.8471, 1.6511, 16.7843, 1.7400,
16.2581, 1.1391], grad_fn=IndexBackward0>)
tensor([2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0559,
15.0810, 2.0389])

Epoch 0026 | Training loss 6.682505 | Training R2 0.879105 | Validation loss 6.442839 | Validation R2 0.898628
Best loss 6.442839 | Best epoch 0026

100%##### 672/672 [02:29<00:00, 4.48it/s]
tensor([3.0113, 11.6365, 1.9527], grad_fn=IndexBackward0>)
tensor([2.0948, 9.5297, 2.0948])

Epoch 0027 | Training loss 6.799114 | Training R2 0.874849 | Validation loss 6.605771 | Validation R2 0.893410
Best loss 6.442839 | Best epoch 0026

100%##### 672/672 [02:33<00:00, 4.39it/s]
tensor([10.0965, 64.9965, 18.0683, 2.7577, 49.3049, 19.3117, 7.8074, 5.1164],
grad_fn=IndexBackward0>)
tensor([4.8299, 69.1500, 18.3480, 1.7573, 53.2860, 17.7690, 5.0245, 1.7018])

Epoch 0028 | Training loss 7.477236 | Training R2 0.848640 | Validation loss 9.610397 | Validation R2 0.774393
Best loss 6.442839 | Best epoch 0026

100%##### 672/672 [02:34<00:00, 4.36it/s]
tensor([6.7122, 47.8820, 13.4944, 2.2469], grad_fn=IndexBackward0>)
tensor([2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0029 | Training loss 6.323672 | Training R2 0.891740 | Validation loss 5.862009 | Validation R2 0.916061
Best loss 5.862009 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py --fold 1 --model 3 --save fold_1 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:27<00:00, 7.66it/s]
tensor([2.1615, 4.0593, 5.0546, 5.4167, 7.8210, 8.3762, 18.0642, 11.1145,
11.2536, 13.7084, 14.0987], grad_fn=IndexBackward0>)
tensor([7.7458, 46.1910, 15.8890, 2.9155, 46.8330, 2.9904, 18.0300, 5.5715,
2.9028, 17.7490, 2.8574])

Epoch 0001 | Training loss 25.062193 | Training R2 -0.700463 | Validation loss 31.127050 | Validation R2 -1.366714
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.65it/s]
tensor([4.8389, 7.9815, 8.0795, 8.1939], grad_fn=IndexBackward0>)
tensor([2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0002 | Training loss 25.686121 | Training R2 -0.786184 | Validation loss 33.511566 | Validation R2 -1.743212
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.64it/s]
tensor([10.7876, 14.7278, 14.7281, 14.7284, 14.7289, 14.7290, 14.7307, 14.7318,
14.7326], grad_fn=IndexBackward0>)
tensor([10.7920, 67.8230, 50.2480, 40.4590, 28.8060, 18.4230, 11.9080, 6.6646,
4.3127])

Epoch 0003 | Training loss 24.546101 | Training R2 -0.631151 | Validation loss 32.111191 | Validation R2 -1.510737
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([3.3280, 8.1549], grad_fn=IndexBackward0>)
tensor([2.4489, 16.6950])

Epoch 0004 | Training loss 22.813705 | Training R2 -0.409032 | Validation loss 29.552938 | Validation R2 -1.133395
Best loss 29.552938 | Best epoch 0004

100%##### 672/672 [01:27<00:00, 7.64it/s]
tensor([2.0743, 3.6092, 3.5648, 3.4382, 3.1781, 2.7690, 2.3375, 1.7644, 1.4013],
grad_fn=IndexBackward0>)
tensor([0.0492, 5.6725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4778, 0.1872, 0.0927])

Epoch 0005 | Training loss 18.439297 | Training R2 0.079513 | Validation loss 20.436989 | Validation R2 -0.020243
Best loss 20.436989 | Best epoch 0005

100%##### 672/672 [01:27<00:00, 7.65it/s]
tensor([14.8184, 21.9930, 21.1540, 19.1529, 25.6132, 24.3171, 21.8630, 28.2239,
26.0049, 23.5441, 29.0066, 27.8578, 24.1761], grad_fn=IndexBackward0>)
tensor([6.2430, 65.0400, 25.1060, 6.2933, 69.2710, 23.5690, 4.5701, 60.7910,
23.4760, 4.5602, 60.2770, 23.3020, 4.5263])

Epoch 0006 | Training loss 17.760078 | Training R2 0.146000 | Validation loss 19.276941 | Validation R2 0.092292
Best loss 19.276941 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.63it/s]
tensor([7.2685, 17.8126, 17.6222, 17.4313, 16.6626, 16.0806, 15.2971, 14.1040,
19.7325, 18.0599, 16.3651], grad_fn=IndexBackward0>)
tensor([0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
39.4790, 6.4477, 1.1231])

Epoch 0007 | Training loss 17.224669 | Training R2 0.196787 | Validation loss 18.606171 | Validation R2 0.154363
Best loss 18.606171 | Best epoch 0007

100%##### 672/672 [01:28<00:00, 7.63it/s]
tensor([8.3480, 18.9609, 17.0796, 13.5076, 19.1425, 16.7560, 12.2467, 17.5037,
15.0191, 9.3061, 14.1035, 11.0100], grad_fn=IndexBackward0>)
tensor([4.9161, 42.0730, 5.4589, 60.7050, 39.7010, 5.1625, 0.1270, 38.5530,
6.6617, 0.1233, 37.8370, 4.9161])

Epoch 0008 | Training loss 16.800960 | Training R2 0.235009 | Validation loss 18.307007 | Validation R2 0.174167
Best loss 18.307007 | Best epoch 0008

100%##### 672/672 [01:27<00:00, 7.64it/s]
tensor([5.5405, 18.0450, 15.2522, 13.2369, 12.8317, 18.4610, 14.6005, 11.4213,
11.0037, 18.3732, 18.1442, 13.0661, 11.2020, 9.0967, 9.6595],
grad_fn=IndexBackward0>)
tensor([9.0083, 13.5140, 3.7950, 1.5319, 1.2778, 13.2800, 3.7295, 1.2557,
3.7290, 1.5053, 1.2555, 13.1800, 3.7035, 1.4950, 1.2470])

Epoch 0009 | Training loss 16.176075 | Training R2 0.291605 | Validation loss 17.658400 | Validation R2 0.238313
Best loss 17.658400 | Best epoch 0009

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([4.4795, 11.0215, 9.0239, 6.1657, 12.2526, 8.1955, 6.0050, 5.2888,
5.0226], grad_fn=IndexBackward0>)
tensor([3.7604, 17.0090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6854,
1.9625])

Epoch 0010 | Training loss 15.784349 | Training R2 0.325499 | Validation loss 17.559269 | Validation R2 0.246848
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.62it/s]
tensor([12.7334, 35.1197, 29.4522, 23.7090, 18.7520, 32.3220, 24.1075],
grad_fn=IndexBackward0>)
tensor([15.0620, 56.9590, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0011 | Training loss 19.306719 | Training R2 -0.009128 | Validation loss 25.415319 | Validation R2 -0.577833
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.59it/s]
tensor([32.0309, 42.7443, 41.9388, 41.1327, 39.5190, 37.9050, 47.3776, 44.0538,
40.7275, 49.5277, 43.8061, 41.0659, 49.2414, 39.0008, 46.0657, 34.0696,
42.4265, 29.7071, 24.2032, 27.1146, 31.0529, 26.3207, 30.2090, 25.4065],
grad_fn=IndexBackward0>)
tensor([50.5520, 41.9500, 32.6790, 27.1470, 20.1900, 15.4500, 55.2420, 32.3270,
21.5020, 60.6230, 31.3470, 24.0360, 61.0120, 24.6620, 62.3610, 24.9130,
62.5010, 25.0130, 62.4200, 24.9040, 62.3050, 62.3600, 24.9370])

Epoch 0012 | Training loss 15.314219 | Training R2 0.365000 | Validation loss 18.021051 | Validation R2 0.206713
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.56it/s]

```
tensor([ 0.5030, 2.0243, 1.2888, 0.5755, 0.0550, -1.1188, -1.4900, -1.7581,
        -1.9126, -2.0494, -1.1390, -1.4614, -1.5448, -1.7284, -1.9236],
       grad_fn=<IndexBackward0>)
tensor([[19.1027, 4.3675, 3.3207, 2.6789, 2.2198, 1.1160, 0.6726, 0.3426, 0.2066,
        0.1245, 4.4427, 1.1442, 0.8164, 0.3513, 0.1277]])

Epoch 0013 | Training loss 14.627570 | Training R2 0.420740 | Validation loss 16.876558 | Validation R2 0.304275
Best loss 16.876558 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.531t/s]
tensor([ 8.8011, 44.5529, 42.7156, 40.8827, 31.7829, 26.4018, 19.3116, 9.0496,
        38.4039, 23.2554, 15.9224, 11.0489, 20.7719, 15.0965, 11.2353, 18.4193,
        15.1102, 12.8798, 18.1327, 16.6533, 15.1084, 19.4565, 18.0778, 16.5798,
        18.9628], grad_fn=<IndexBackward0>)
tensor([ 4.2077, 59.4320, 46.9850, 38.1280, 14.2580, 7.9220, 3.6186, 1.1171,
        59.4890, 17.3990, 4.4157, 1.1207, 17.1950, 4.3640, 1.1075, 17.2810,
        4.3856, 1.1130, 16.8630, 5.2057, 1.0801, 16.8560, 4.2779, 1.0857,
        4.2077])

Epoch 0014 | Training loss 13.552494 | Training R2 0.502758 | Validation loss 15.915753 | Validation R2 0.381237
Best loss 15.915753 | Best epoch 0014

100%##### 672/672 [01:29<00:00, 7.511t/s]
tensor([ 4.4982, 21.3597, 9.1296], grad_fn=<IndexBackward0>)
tensor([ 4.6703, 20.6660, 3.8425])

Epoch 0015 | Training loss 13.312044 | Training R2 0.520246 | Validation loss 15.572647 | Validation R2 0.407628
Best loss 15.572647 | Best epoch 0015

100%##### 672/672 [01:29<00:00, 7.481t/s]
tensor([ 5.1438, 8.7150, 0.2335, 17.3058, 10.0088, 9.1330, 17.2026, 10.6096,
        10.4114], grad_fn=<IndexBackward0>)
tensor([ 8.4665, 2.6608, 2.2691, 18.5760, 3.2225, 2.3435, 25.5770, 3.2261,
        2.3462])

Epoch 0016 | Training loss 12.642657 | Training R2 0.567281 | Validation loss 14.518663 | Validation R2 0.485100
Best loss 14.518663 | Best epoch 0016

100%##### 672/672 [01:30<00:00, 7.441t/s]
tensor([ 8.6458, 39.9109, 19.5235, 1.5698, 25.5519, 13.4577, 2.6799],
       grad_fn=<IndexBackward0>)
tensor([ 2.9463, 47.9160, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173])

Epoch 0017 | Training loss 12.009523 | Training R2 0.609536 | Validation loss 13.955899 | Validation R2 0.524243
Best loss 13.955899 | Best epoch 0017

100%##### 672/672 [01:30<00:00, 7.391t/s]
tensor([[16.5268, 53.2245, 25.6311, 4.3723, 32.4923, 17.3056, 3.8944, 25.6400,
        15.9058, 4.0992], grad_fn=<IndexBackward0>)
tensor([[12.3700, 69.3770, 19.4920, 2.1362, 68.1120, 16.1970, 2.1042, 46.9250,
        16.8400, 2.1878]])

Epoch 0018 | Training loss 11.491714 | Training R2 0.642481 | Validation loss 14.003984 | Validation R2 0.520958
Best loss 13.955899 | Best epoch 0017

100%##### 672/672 [01:31<00:00, 7.311t/s]
tensor([[12.2880, 60.9434, 23.6948, 3.7652, 41.1423, 23.2139, 4.3050, 37.7644,
        21.6512, 10.9115, 4.7921, 33.1081, 17.9587, 9.4281, 4.5785],
       grad_fn=<IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2978, 62.7360,
        19.2460, 7.4059, 3.3370, 62.9420, 16.8690, 6.5660, 3.3422])

Epoch 0019 | Training loss 10.620493 | Training R2 0.694636 | Validation loss 12.171548 | Validation R2 0.638123
Best loss 12.171548 | Best epoch 0019

100%##### 672/672 [01:33<00:00, 7.221t/s]
tensor([[17.7791, 60.7902, 21.8121, 3.3622, 36.1535, 18.7518, 3.8016, 34.5173,
        18.5345, 3.7166], grad_fn=<IndexBackward0>)
tensor([[13.8520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517, 62.2630,
        23.6030, 4.7676]])

Epoch 0020 | Training loss 9.667159 | Training R2 0.746996 | Validation loss 11.243977 | Validation R2 0.691177
Best loss 11.243977 | Best epoch 0020

100%##### 672/672 [01:35<00:00, 7.061t/s]
tensor([ 6.4277, 43.8652, 10.8547, 0.8505], grad_fn=<IndexBackward0>)
tensor([ 1.7780, 53.9210, 16.2500, 5.2152])

Epoch 0021 | Training loss 9.009152 | Training R2 0.780266 | Validation loss 9.978053 | Validation R2 0.756801
Best loss 9.978053 | Best epoch 0021

100%##### 672/672 [01:38<00:00, 6.821t/s]
tensor([ 7.1529, 44.6963, 12.5524, 2.6736, -0.6076, -1.8314, 12.8853, 3.2542,
        0.2715, -0.8585, 10.7207, 4.6728, 1.5571, 0.3930],
       grad_fn=<IndexBackward0>)
tensor([ 5.1825, 48.9670, 16.9700, 6.3620, 6.3087, 2.7427, 18.1490, 6.8004,
        3.8809, 2.9310, 14.1770, 7.0320, 4.0131, 0.8316])

Epoch 0022 | Training loss 8.104481 | Training R2 0.822100 | Validation loss 8.888013 | Validation R2 0.807035
Best loss 8.888013 | Best epoch 0022

100%##### 672/672 [01:44<00:00, 6.461t/s]
tensor([ 9.0191, 62.1309, 0.5210, -0.0926, 2.1431], grad_fn=<IndexBackward0>)
tensor([ 2.7853, 66.9550, 2.7495, 2.3342, 2.7853])

Epoch 0023 | Training loss 8.010061 | Training R2 0.826300 | Validation loss 9.681182 | Validation R2 0.771057
Best loss 8.888013 | Best epoch 0022

100%##### 672/672 [01:56<00:00, 5.761t/s]
tensor([ 3.4122, 6.5380, 0.7621, -1.5433, 25.6093, 7.9584, 1.0656, -0.6848,
        -1.0974, 7.6064, 3.0400, -1.3328, 15.6097, 3.6924, -0.7531, -1.4187,
        17.5910, 4.1631, 1.1990, -1.6550, 11.6507, -1.1651, -2.1033, 22.0726,
        5.6306, -0.3096, -2.2767, 22.2590, 5.2173, -0.8715, -2.5756, 21.4615,
        3.5346, -1.2039, -2.7982, 20.7264, 1.8163, -2.2834],
       grad_fn=<IndexBackward0>)
tensor([ 3.7684, 12.6090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0281, 2.6854,
        1.9625, 15.0820, 0.0548, 1.9640, 29.0970, 9.7026, 3.2372, 2.0224,
        33.9450, 11.2970, 4.4089, 2.0129, 24.7420, 3.7684, 2.0126, 48.9190,
        15.4550, 5.1565, 2.0125, 48.9190, 15.4550, 5.1565, 2.0125, 48.9190,
        13.2120, 5.1565, 2.0125, 48.9190, 11.2950, 3.7684])

Epoch 0024 | Training loss 7.332561 | Training R2 0.854441 | Validation loss 7.375947 | Validation R2 0.867106
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:15<00:00, 4.961t/s]
tensor([[17.5115, 75.5606, 24.1151, 5.0300, 47.0906, 15.6007, 4.7301, 40.6322,
        3.4479, 40.0268, 15.2362], grad_fn=<IndexBackward0>)
tensor([[17.5830, 71.0050, 22.2940, 2.9600, 49.2230, 14.1200, 2.9076, 52.3500,
        3.1770, 44.7320, 17.5830]])

Epoch 0025 | Training loss 8.509421 | Training R2 0.803967 | Validation loss 9.115965 | Validation R2 0.797010
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:22<00:00, 4.711t/s]
tensor([ 9.7489, 43.1030, 33.0272, 24.0104, 12.7075, 8.0704, 4.5794, 2.5688,
        37.6630, 14.1537, 4.5239, 4.7297, 40.0373, 15.7862, 7.8193, 6.2943,
        41.6687, 24.4670, 7.7723, 7.5809, 42.2466, 14.8580, 10.3533, 8.6096,
        42.5099, 10.5460, 11.0454, 9.2425, 43.5380, 17.5699, 11.5147, 9.8455,
        44.1107, 19.8935, 11.9677, 10.3997, 44.5415, 20.4090],
       grad_fn=<IndexBackward0>)
tensor([[12.5050, 42.0500, 34.8410, 24.5230, 12.4040, 7.4428, 3.7669, 1.3563,
        42.1990, 12.2400, 3.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3385,
        43.0630, 20.0330, 1.9210, 1.3647, 43.0660, 8.8069, 3.7979, 1.3674,
        42.5380, 12.3470, 3.7496, 1.3500, 42.9850, 10.5230, 3.7888, 1.3642,
        43.0840, 12.5050, 3.7977, 1.3674, 43.0840, 12.5050])

Epoch 0026 | Training loss 7.642862 | Training R2 0.841860 | Validation loss 9.652371 | Validation R2 0.772418
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:25<00:00, 4.611t/s]
tensor([ 8.1295, 16.1995, 3.0024, 38.7570, 16.0048], grad_fn=<IndexBackward0>)
tensor([12.8470, 12.6880, 1.0025, 53.5960, 12.8470])

Epoch 0027 | Training loss 6.217919 | Training R2 0.895331 | Validation loss 6.709231 | Validation R2 0.890845
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:29<00:00, 4.501t/s]
tensor([ 2.9501, 16.0022, 0.4070, 41.0720, 13.1140, 0.7645, 43.0057, 15.5036,
        2.9654, 1.1200, 14.4533, 3.8009, 1.5330, 17.2710, 4.1735, 2.0491,
        5.0674, 2.6229, 7.1750, 3.4510, 51.3901, 6.0601, 3.6774, 0.0776,
        4.6272, 41.4533, 7.2000, 4.7518], grad_fn=<IndexBackward0>)
tensor([ 0.9887, 13.2440, 1.0095, 44.2920, 11.1530, 1.0742, 43.9100, 13.4300,
        2.0234, 1.0049, 2.6229, 3.2420, 1.0064, 15.4190, 3.2397, 1.0054,
        3.3101, 1.0273, 4.8677, 1.0228, 53.4230, 3.3111, 1.0275, 4.8942,
        1.0283, 40.7600, 3.0721, 0.9087])

Epoch 0028 | Training loss 6.206502 | Training R2 0.895715 | Validation loss 7.057061 | Validation R2 0.878321
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:31<00:00, 4.451t/s]
tensor([ 7.6626, 77.2475, 59.0001, 48.7603, 39.5699, 12.5270, 0.4092, -2.0069,
        -3.5056, 59.4931, 14.3282, 1.8460, -1.0112, 59.4113, 14.9668, 2.1040,
        -0.3000, 60.1407, 15.7402, 2.9394, 0.3230], grad_fn=<IndexBackward0>)
tensor([ 1.7195, 93.2050, 73.9670, 62.0350, 53.2360, 20.3050, 11.4010, 7.5733,
        4.9950, 75.1950, 26.9070, 10.1920, 5.0947, 73.0930, 26.4440, 10.0100,
        5.0069, 74.0470, 26.5260, 10.0400, 5.0226])

Epoch 0029 | Training loss 5.844729 | Training R2 0.907518 | Validation loss 5.710409 | Validation R2 0.920344
Best loss 5.710409 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df['PTNM'] = df['PTNM'] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Sfoid_models/Neural-ODE/run_train.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Sfoid_models/Neural-ODE/run_train.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([1.9838, 5.0573, 5.0573, 5.1375, 5.1977], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0001 | Training loss 25.589478 | Training R2 -0.772768 | Validation loss 32.346756 | Validation R2 -1.555826
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.55it/s]
tensor([5.6753, 9.1968, 9.1520, 9.1070, 9.0600, 12.3688, 12.3259, 12.2829,
12.2460, 15.6801, 15.6373, 15.5945, 15.5579, 18.8076, 18.8448, 18.8021,
18.7654, 22.0656, 22.0229, 21.9801, 21.9435, 25.1256, 25.0829, 25.0402,
25.0036, 28.1739, 28.1312, 28.0886, 28.0520, 31.1455, 31.1029, 31.0603,
31.0238, 34.1763, 34.1337, 34.0912, 34.0547, 37.1030, 37.0544, 37.0118,
40.1939, 40.1514, 40.1089, 40.0725, 43.2250, 43.1825, 43.1401, 43.1036,
46.1381, 46.0957, 46.0532, 46.0160, 48.9333, 48.8909, 48.8121, 51.7009,
51.6585, 51.6222, 54.7401, 54.6392, 57.7422, 57.6999, 57.6637],
grad_fn=<IndexBackward0>)
tensor([1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813,
1.6846, 42.8210, 13.2600, 4.4680, 1.7581, 41.6580, 12.9060, 4.3470,
1.7105, 41.2450, 12.7800, 4.3043, 1.6937, 39.8740, 12.3490, 4.1591,
1.6366, 39.6830, 12.2800, 4.1388, 1.6285, 38.6890, 11.9800, 4.0377,
1.5808, 39.3970, 12.2000, 4.1090, 1.6171, 16.2800, 4.4939, 1.5810,
39.7140, 12.3040, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 1.6182,
37.9910, 11.7700, 3.9642, 1.5598, 36.4990, 11.3100, 1.4989, 11.3470,
3.8219, 1.5038, 39.1180, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0003 | Training loss 25.064499 | Training R2 -0.700776 | Validation loss 33.287090 | Validation R2 -1.706584
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([11.9925, 16.1007, 15.6565, 14.7926, 18.7813, 18.1950, 17.1649],
grad_fn=<IndexBackward0>)
tensor([13.8520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517])

Epoch 0004 | Training loss 19.580649 | Training R2 -0.037956 | Validation loss 22.115347 | Validation R2 -0.194696
Best loss 22.115347 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([11.7457, 16.1328, 15.2492], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0005 | Training loss 17.637009 | Training R2 0.157863 | Validation loss 10.753833 | Validation R2 0.140961
Best loss 18.753833 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([18.9408, 25.6320, 24.2650, 21.7004, 27.7520, 26.0064, 22.9544, 20.8005,
26.7267, 22.9611], grad_fn=<IndexBackward0>)
tensor([13.8520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517, 62.2630,
23.6030, 4.7676])

Epoch 0006 | Training loss 17.212334 | Training R2 0.197937 | Validation loss 18.404135 | Validation R2 0.172628
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([7.4089, 16.4973, 14.5521, 12.8453, 11.0989, 10.8038, 14.5344, 11.6942,
9.5200, 9.1614], grad_fn=<IndexBackward0>)
tensor([0.4168, 38.0910, 7.1683, 1.7787, 0.4414, 0.3499, 11.5080, 1.7944,
0.4453, 0.3530])

Epoch 0007 | Training loss 18.241096 | Training R2 0.099195 | Validation loss 21.649376 | Validation R2 -0.144882
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([21.2631, 37.7968, 34.6909, 28.8175, 35.9441, 28.1752, 40.1245, 34.2910,
23.3075, 27.6585, 19.4056, 23.0779, 19.0806, 24.1141, 21.9171],
grad_fn=<IndexBackward0>)
tensor([20.1000, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441, 78.8070, 24.2140,
3.3317, 23.8640, 3.2836, 23.7820, 3.2723, 61.1610, 20.1000])

Epoch 0008 | Training loss 15.880821 | Training R2 0.317229 | Validation loss 17.267464 | Validation R2 0.271672
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([29.5514, 33.9478, 33.5019, 33.0508, 31.7000, 36.2072, 34.6281, 32.9590,
35.4917, 33.4942, 37.8410, 33.2047, 37.4423, 32.1499, 36.2251, 30.2793,
34.2453, 27.6422, 31.5599, 24.2530, 28.0946, 21.0433, 24.2154],
grad_fn=<IndexBackward0>)
tensor([66.9750, 34.8300, 30.4050, 27.1220, 19.3810, 59.4210, 39.4690, 28.2220,
45.4640, 32.5130, 71.1690, 34.2430, 72.7160, 35.0360, 72.9800, 35.1970,
73.1260, 35.2700, 73.7120, 35.5420, 73.9550, 35.6660, 46.9700])

Epoch 0009 | Training loss 15.588125 | Training R2 0.342165 | Validation loss 17.531309 | Validation R2 0.249244
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:30<00:00, 7.47it/s]
tensor([22.3900, 44.0035, 38.3123, 27.5719, 42.2590, 33.7127, 17.9093, 31.7069,
21.0901, 15.1004, 21.4000, 18.1900, 14.7075, 19.6300, 17.6300, 14.6714,
18.9939, 17.1625, 14.7096, 10.3096, 16.8863, 14.2772, 17.6625, 16.0937,
14.1760, 16.9282, 15.6259, 13.6606, 16.4270, 15.1709],
grad_fn=<IndexBackward0>)
tensor([22.8850, 73.4140, 23.4800, 3.5482, 76.4500, 24.6100, 3.7109, 76.3100,
24.5840, 3.7130, 76.0510, 21.1050, 3.7013, 75.8210, 24.4220, 3.6093,
74.7130, 24.1510, 3.6403, 73.3630, 23.6320, 3.5700, 72.1350, 23.2310,
3.5094, 70.4750, 19.6300, 3.4295, 70.9020, 22.8850])

Epoch 0010 | Training loss 15.053199 | Training R2 0.386539 | Validation loss 16.905653 | Validation R2 0.301874
Best loss 16.905653 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.46it/s]
tensor([18.1234, 47.1316, 39.9245], grad_fn=<IndexBackward0>)
tensor([7.2340, 79.9040, 30.3950])

Epoch 0011 | Training loss 14.768456 | Training R2 0.409528 | Validation loss 16.615559 | Validation R2 0.325627
Best loss 16.615559 | Best epoch 0011

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([11.6720, 32.0302, 24.0439, 7.9924, 43.3818, 12.4450, 8.1120, 14.4407,
11.5844, 0.4570], grad_fn=<IndexBackward0>)
tensor([7.1200, 40.3090, 16.0790, 2.5997, 40.2000, 10.9370, 2.6928, 34.4200,
12.7210, 2.7225])

Epoch 0012 | Training loss 14.076530 | Training R2 0.463561 | Validation loss 15.982700 | Validation R2 0.376014
Best loss 15.982700 | Best epoch 0012

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([15.4169, 37.7438, 26.4691, 7.0004, 27.0034, 15.1891],
grad_fn=<IndexBackward0>)
tensor([15.6310, 53.5120, 15.1840, 1.6724, 54.0710, 15.6310])

Epoch 0013 | Training loss 13.712152 | Training R2 0.490973 | Validation loss 15.644684 | Validation R2 0.402134
Best loss 15.644684 | Best epoch 0013

100%##### 672/672 [01:31<00:00, 7.37it/s]
tensor([12.0577, 36.3003, 23.6037, 11.4204, 3.9002, 24.7131, 13.2179, 7.2145,
3.9259, 17.6060, 11.4485, 7.1599, 4.1007, 14.8795, 10.1405, 7.4436,
5.7456, 12.6350, 10.5755, 0.8864, 7.3162, 13.0429, 11.6113, 9.6312,
0.1763, 13.7002, 12.1540, 10.3492, 8.4799, 14.0624, 12.3707],
grad_fn=<IndexBackward0>)
tensor([15.8670, 48.0290, 15.0320, 5.2611, 2.1393, 49.5140, 15.6140, 5.4640,
2.2222, 49.5800, 15.6390, 5.4735, 2.2259, 49.6100, 15.6440, 5.4753,
2.2264, 49.5000, 15.6410, 5.4740, 2.2259, 49.5930, 15.6410, 7.7110,
2.2260, 49.5930, 15.6410, 5.4742, 2.2260, 50.3130, 15.8670])

Epoch 0014 | Training loss 13.242213 | Training R2 0.525266 | Validation loss 15.322500 | Validation R2 0.426506
Best loss 15.322500 | Best epoch 0014

100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([5.4798, 30.7003, 14.7000, 2.5093, -1.7000, 8.5024, 1.9909, -1.6791,
grad_fn=<IndexBackward0>)
tensor([1.7436, 45.0730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866])

Epoch 0015 | Training loss 12.924088 | Training R2 0.547002 | Validation loss 14.716954 | Validation R2 0.470939
Best loss 14.716954 | Best epoch 0015

100%##### 672/672 [01:31<00:00, 7.31it/s]
tensor([15.6100, 15.2221, 16.2939, 0.2661, 24.2609], grad_fn=<IndexBackward0>)
tensor([16.1690, 59.8340, 5.3050, 1.4092, 16.1690])

Epoch 0016 | Training loss 11.098344 | Training R2 0.616732 | Validation loss 14.322600 | Validation R2 0.498908
Best loss 14.322600 | Best epoch 0016

100%##### 672/672 [01:32<00:00, 7.24it/s]
tensor([12.7216, 59.7177, 25.1669, 4.2772, 34.5799, 21.0603, 9.3700, 3.6991,
31.5247, 18.5450, 0.0795, 3.1359, 25.5747, 15.5161, 5.9220],
grad_fn=<IndexBackward0>)
tensor([4.0299, 69.1500, 18.3400, 1.7573, 53.2800, 17.7690, 5.0245, 1.7018,
65.7010, 20.9510, 4.9462, 1.6753, 64.1100, 17.0090, 4.0299])

Epoch 0017 | Training loss 11.401729 | Training R2 0.640058 | Validation loss 13.213898 | Validation R2 0.573487
Best loss 13.213898 | Best epoch 0017

```
100%##### 672/672 [01:33<00:00, 7.181it/s]
tensor([ 2.9863, 32.5171, 27.8892, 23.1816, 13.6546, 9.5199, 5.4563, 2.9917,
         0.8526, 27.3178, 15.6958, 7.8388, 3.7228, 24.6298, 14.8523, 8.5628,
         4.3518, 22.1835, 15.0576, 8.9973, 5.4548, 22.2026, 13.7354, 9.1169,
         6.3164, 22.1488, 14.2489, 9.6895, 7.1869, 21.7399, 14.4235, 18.2883,
         8.8124, 21.3545, 11.1481, 8.8646, 20.7642, 15.1376, 11.4578, 9.4312,
         20.2414, 15.3678, 12.8332, 10.2129, 21.1668, 16.4321, 13.8078, 10.8106,
         21.6568, 17.0286, 13.6380, 11.4462, 22.2884, 17.6234, 14.2651, 12.1728,
         18.4876, 15.8337]) grad_fn=<IndexBackward0>)

Epoch 0018 | Training loss 10.813417 | Training R2 0.683441 | Validation loss 13.283379 | Validation R2 0.574166
Best loss 13.283379 | Best epoch 0018

100%##### 672/672 [01:34<00:00, 7.121it/s]
tensor([ 9.7498, 48.5584, 13.2851, 8.8898, 25.9487, 14.4128, 2.2655, 1.0768,
         24.7947, 14.0786, 1.6582], grad_fn=<IndexBackward0>)
tensor([ 7.3688, 43.7328, 14.9218, 2.7685, 45.9558, 18.0780, 3.8155, 2.9446,
         46.1388, 18.1458, 2.9568])

Epoch 0019 | Training loss 10.473638 | Training R2 0.783023 | Validation loss 13.268398 | Validation R2 0.569962
Best loss 13.283379 | Best epoch 0018

100%##### 672/672 [01:36<00:00, 6.971it/s]
tensor([ 2.5659, 19.4985, 2.8311, 33.7559, 17.7553, 2.5439],
        grad_fn=<IndexBackward0>)
tensor([ 0.9887, 13.2448, 1.0495, 44.2928, 11.1538, 1.0742])

Epoch 0020 | Training loss 9.496678 | Training R2 0.755842 | Validation loss 10.343183 | Validation R2 0.738677
Best loss 10.343183 | Best epoch 0020

100%##### 672/672 [01:40<00:00, 6.781it/s]
tensor([ 6.5488, 27.2245, 17.8168, 14.4449, 9.4895, 26.6533, 19.8893,
         14.0566, 29.3762, 22.2869, 16.0398, 30.4389, 16.7182, 38.6311, 16.9595,
         38.6151, 17.0785, 38.7607, 17.0528, 38.7647, 16.8884, 38.8296, 16.6525,
         38.7948, 16.4834, 27.5987, 16.3812, 38.4298, 16.1835, 38.8555, 15.9718,
         29.7875, 15.9149, 29.5319, 15.9832, 15.8856, 26.1478, 15.8869, 28.9241,
         15.8869, 28.7380, 15.8838, 28.5423, 15.8782, 28.2471, 15.7892, 28.3878,
         15.8788, 28.1359, 23.1418], grad_fn=<IndexBackward0>)
tensor([13.4798, 18.8578, 13.8988, 18.7488, 8.5627, 6.6488, 22.6980, 18.6938,
         5.8463, 23.2438, 11.0858, 6.0691, 23.4238, 6.1265, 23.3158, 6.1835,
         23.4518, 6.1355, 23.4768, 6.1434, 23.1788, 6.0785, 23.2758, 6.0899,
         23.2858, 6.0948, 17.6118, 6.0951, 23.2938, 6.0968, 23.1398, 6.0582,
         23.1128, 6.0491, 23.1858, 6.0467, 6.0455, 17.4698, 6.0458, 23.1848,
         6.0462, 23.0988, 6.0454, 23.0978, 6.0451, 22.8858, 5.9719, 23.0398,
         6.0265, 22.6598, 13.4798])

Epoch 0021 | Training loss 7.951676 | Training R2 0.828823 | Validation loss 8.662682 | Validation R2 0.816695
Best loss 8.662682 | Best epoch 0021

100%##### 672/672 [01:47<00:00, 6.231it/s]
tensor([ 5.0714, 41.2239, 18.6933, 1.8153, -1.6648, 32.1178, 11.6598, 2.8483],
        grad_fn=<IndexBackward0>)
tensor([ 2.2788, 48.9848, 9.4533, 2.2722, 0.6695, 48.8838, 9.4476, 2.2788])

Epoch 0022 | Training loss 7.689084 | Training R2 0.843258 | Validation loss 8.749406 | Validation R2 0.813886
Best loss 8.662682 | Best epoch 0021

100%##### 672/672 [02:07<00:00, 5.281it/s]
tensor([ 7.4991, 41.7259, 21.5588, 2.8759, -0.8212, -0.1132],
        grad_fn=<IndexBackward0>)
tensor([ 7.2829, 42.8448, 12.3488, 4.1313, 1.6174, 1.6724])

Epoch 0023 | Training loss 6.876882 | Training R2 0.872883 | Validation loss 6.888918 | Validation R2 0.886753
Best loss 6.888918 | Best epoch 0023

100%##### 672/672 [02:26<00:00, 4.581it/s]
tensor([18.0532, 11.7258, 3.9888, 25.9815, 11.5955, 4.2805, 24.3615, 10.3238,
         4.2589], grad_fn=<IndexBackward0>)
tensor([16.2548, 16.8158, 3.7387, 46.7128, 18.2518, 4.8494, 39.1618, 16.6898,
         4.1575])

Epoch 0024 | Training loss 6.344456 | Training R2 0.891827 | Validation loss 6.287634 | Validation R2 0.983429
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:31<00:00, 4.451it/s]
tensor([ 1.6894, 23.4638, 1.5938, -1.5898, 2.5777, 38.9285, 8.1172, 1.3945,
         -1.8457], grad_fn=<IndexBackward0>)
tensor([ 0.1465, 23.7248, 3.6828, 0.5996, 0.1266, 35.6828, 5.5289, 1.1669,
         0.1988])

Epoch 0025 | Training loss 7.193916 | Training R2 0.859893 | Validation loss 8.765658 | Validation R2 0.812311
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:33<00:00, 4.381it/s]
tensor([ 8.8472, 41.0249, 8.3487, 2.1899, 36.6626, 12.1595],
        grad_fn=<IndexBackward0>)
tensor([ 9.5449, 37.6978, 6.5141, 0.8286, 37.8148, 9.5449])

Epoch 0026 | Training loss 6.314891 | Training R2 0.892868 | Validation loss 7.142266 | Validation R2 0.875393
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:37<00:00, 4.261it/s]
tensor([ 8.5635, 52.2488, 1.5635, 17.5187, 1.9839, 16.5124, 1.4483],
        grad_fn=<IndexBackward0>)
tensor([ 5.0488, 57.3478, 1.4345, 18.1518, 1.4741, 17.6588, 1.4348])

Epoch 0027 | Training loss 6.055744 | Training R2 0.908719 | Validation loss 5.718658 | Validation R2 0.928116
Best loss 5.718658 | Best epoch 0027

100%##### 672/672 [02:39<00:00, 4.211it/s]
tensor([ 7.0788, 42.2588, 11.1324, 3.1823, 1.2874, 2.6817, 21.2856, 6.6837,
         3.4198], grad_fn=<IndexBackward0>)
tensor([ 7.2829, 42.8448, 12.3488, 4.1313, 1.6174, 1.6724, 20.9978, 5.9948,
         1.7166])

Epoch 0028 | Training loss 6.592818 | Training R2 0.882328 | Validation loss 7.778147 | Validation R2 0.852522
Best loss 5.718658 | Best epoch 0027

100%##### 672/672 [02:38<00:00, 4.231it/s]
tensor([ 3.7971, 35.3375, 9.4819, 1.6825, 0.3244, -0.4881, 13.2231, 2.0788,
         0.1861, 0.8965, 12.3868, 2.4895, 0.1887, 0.8419],
        grad_fn=<IndexBackward0>)
tensor([ 0.4168, 38.8918, 7.1683, 1.7787, 0.4414, 0.3409, 11.5888, 1.7944,
         0.4453, 0.3538, 18.8388, 2.1383, 0.4198, 0.3322])

Epoch 0029 | Training loss 5.998582 | Training R2 0.982587 | Validation loss 5.684497 | Validation R2 0.923274
Best loss 5.684497 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/Fold_models/Neural-ODE/run_train.py --fold 1 --model 5 --save fold_1 --lr 0.00085 --tol 1e-4 --epochs 38 --l2 0.1
100%##### 672/672 [01:28<00:00, 7.561it/s]
tensor([2.1999, 5.6524, 5.8418, 6.1936, 9.4868, 9.8432],
        grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6568, 16.1958, 2.1895, 15.9188, 2.1521])

Epoch 0081 | Training loss 24.587435 | Training R2 -0.636649 | Validation loss 29.936558 | Validation R2 -1.189148
Best loss 29.936558 | Best epoch 0081

100%##### 672/672 [01:28<00:00, 7.571it/s]
tensor([ 4.9843, 8.9587, 9.0836, 9.2166, 9.3385, 13.3846, 13.5179, 13.6512,
         13.7654, 17.8186, 17.9522, 18.0858], grad_fn=<IndexBackward0>)
tensor([ 4.7756, 68.3888, 16.0398, 4.5623, 1.5531, 62.9598, 16.7748, 4.7714,
         1.6243, 63.8878, 16.7898, 4.7756])

Epoch 0082 | Training loss 25.483658 | Training R2 -0.758136 | Validation loss 33.067993 | Validation R2 -1.671072
Best loss 29.936558 | Best epoch 0081

100%##### 672/672 [01:28<00:00, 7.591it/s]
tensor([ 7.6814, 11.0811, 11.0285], grad_fn=<IndexBackward0>)
tensor([13.8528, 68.8718, 23.1838])

Epoch 0083 | Training loss 24.522168 | Training R2 -0.627971 | Validation loss 32.016544 | Validation R2 -1.583911
Best loss 29.936558 | Best epoch 0081

100%##### 672/672 [01:28<00:00, 7.581it/s]
tensor([ 7.3291, 18.1688, 18.0233, 9.8829], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2258, 11.2884, 5.9828])

Epoch 0084 | Training loss 22.481255 | Training R2 -0.358544 | Validation loss 28.629288 | Validation R2 -1.082123
Best loss 28.629288 | Best epoch 0084

100%##### 672/672 [01:29<00:00, 7.531it/s]
```

```
tensor([14.4474, 19.8099, 19.4276, 18.6136, 23.0821, 21.7736, 26.9981, 26.1418,
        24.3684, 28.5206, 26.5152], grad_fn=<IndexBackward0>)
tensor([20.1880, 76.4080, 23.3870, 3.2869, 20.8640, 3.3441, 78.0870, 24.2140,
        3.3317, 23.8640, 3.2836])

Epoch 0005 | Training loss 19.169922 | Training R2 0.005122 | Validation loss 21.290998 | Validation R2 -0.107291
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:29:00:00, 7.481t/s]
tensor([12.2309, 19.9201, 18.0005, 16.3241, 20.7797, 18.8313, 22.8460, 20.6343,
        24.4485, 21.9717], grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6560, 16.1950, 2.1095, 15.9180, 2.1521, 15.2060, 2.0659,
        15.0810, 2.0389])

Epoch 0006 | Training loss 19.678331 | Training R2 -0.048349 | Validation loss 22.492300 | Validation R2 -0.235770
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:29:00:00, 7.501t/s]
tensor([ 9.0321, 16.7148, 15.5704, 14.4203], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2848, 2.9028])

Epoch 0007 | Training loss 18.438383 | Training R2 0.079604 | Validation loss 20.871935 | Validation R2 -0.064132
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:29:00:00, 7.531t/s]
tensor([ 0.2794, 0.7751, 0.5484, -0.3596, -1.0415, -1.9520, -2.6358, -3.3204,
        -2.3760, -4.0057, -5.6395], grad_fn=<IndexBackward0>)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164,
        1.2248, 0.2320])

Epoch 0008 | Training loss 20.370321 | Training R2 -0.123375 | Validation loss 23.957869 | Validation R2 -0.402859
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:29:00:00, 7.531t/s]
tensor([17.7417, 27.3907, 25.9303], grad_fn=<IndexBackward0>)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0009 | Training loss 19.084763 | Training R2 0.013942 | Validation loss 21.900980 | Validation R2 -0.171647
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:29:00:00, 7.511t/s]
tensor([17.3056, 25.6101, 24.2517, 20.7280, 26.8591, 24.9605, 21.8946, 26.8496,
        25.2540, 22.2393], grad_fn=<IndexBackward0>)
tensor([17.0030, 55.3190, 19.9870, 2.1271, 56.8470, 17.5230, 2.1942, 57.7130,
        17.7900, 2.2277])

Epoch 0010 | Training loss 17.859404 | Training R2 0.136499 | Validation loss 20.114540 | Validation R2 0.011697
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:29:00:00, 7.521t/s]
tensor([ 8.7530, 19.8132, 16.8510, 16.2882, 22.7456, 19.5405, 19.2723],
        grad_fn=<IndexBackward0>)
tensor([ 9.2660, 25.5950, 5.0055, 3.7205, 26.2690, 4.4291, 3.8185])

Epoch 0011 | Training loss 18.237335 | Training R2 0.099566 | Validation loss 20.373814 | Validation R2 -0.013945
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:29:00:00, 7.521t/s]
tensor([ 9.9975, 15.6876, 13.4450, 11.2903, 17.1275, 15.1765, 11.2384],
        grad_fn=<IndexBackward0>)
tensor([14.9510, 17.0060, 6.4340, 2.7857, 51.9570, 17.6200, 2.0727])

Epoch 0012 | Training loss 17.548340 | Training R2 0.166316 | Validation loss 19.443098 | Validation R2 0.076577
Best loss 19.443098 | Best epoch 0012

100%##### 672/672 [01:29:00:00, 7.521t/s]
tensor([ 9.9177, 18.4395, 17.9721, 17.5216, 14.3823, 12.5939, 11.2551, 9.9186,
        16.4753, 13.0464], grad_fn=<IndexBackward0>)
tensor([ 4.1835, 35.5470, 29.2700, 24.3620, 6.9018, 3.3599, 1.9581, 1.1412,
        14.7460, 4.1835])

Epoch 0013 | Training loss 17.206947 | Training R2 0.190439 | Validation loss 19.141432 | Validation R2 0.105009
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:29:00:00, 7.521t/s]
tensor([12.4364, 27.2565, 23.2694, 19.6116, 16.4919, 29.9886, 27.1892, 23.8359,
        20.2024], grad_fn=<IndexBackward0>)
tensor([ 4.7756, 60.3880, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
        1.6243])

Epoch 0014 | Training loss 17.306837 | Training R2 0.109105 | Validation loss 19.362793 | Validation R2 0.004189
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:29:00:00, 7.501t/s]
tensor([ 9.0508, 20.0409, 19.4907, 18.9320, 17.0166, 16.1479, 12.2752, 18.0752,
        0.9708, 18.0787, 14.2077, 10.3545, 6.6562, 18.4221, 14.3182, 10.7028,
        9.1701], grad_fn=<IndexBackward0>)
tensor([ 1.7205, 44.0430, 33.0500, 27.3170, 18.5670, 10.0030, 2.0010, 1.3604,
        0.9431, 27.0900, 6.1533, 1.6721, 0.9567, 23.0090, 6.2359, 1.6946,
        0.9695])

Epoch 0015 | Training loss 16.755096 | Training R2 0.239911 | Validation loss 19.031542 | Validation R2 0.115256
Best loss 19.031542 | Best epoch 0015

100%##### 672/672 [01:29:00:00, 7.481t/s]
tensor([ 0.9582, 1.0904, 0.4565, -1.8299, -3.4424, -5.5529, -7.1404,
        -8.7240, -7.3052, -10.9310, -14.4209], grad_fn=<IndexBackward0>)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164,
        1.2248, 0.2320])

Epoch 0016 | Training loss 16.645119 | Training R2 0.249928 | Validation loss 18.393700 | Validation R2 0.173566
Best loss 18.393700 | Best epoch 0016

100%##### 672/672 [01:33:00:00, 7.201t/s]
tensor([ 6.0242, 20.9083, 15.5757, 10.6441, 6.5071, 20.2002, 15.3091, 10.3295,
        6.4992, 19.2614, 16.2200, 12.1360, 8.1073], grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3010, 4.1701, 1.6409, 41.0410, 12.7110, 4.2013,
        1.6046, 42.0210, 13.2600, 4.4600, 1.7081])

Epoch 0017 | Training loss 16.093096 | Training R2 0.290854 | Validation loss 17.970434 | Validation R2 0.211163
Best loss 17.970434 | Best epoch 0017

100%##### 672/672 [01:37:00:00, 6.881t/s]
tensor([12.0932, 35.1585, 29.2565, 17.6236, 35.2379, 31.1231, 21.2395],
        grad_fn=<IndexBackward0>)
tensor([ 3.0765, 62.3000, 16.2100, 1.3937, 63.5960, 16.5530, 1.4231])

Epoch 0018 | Training loss 15.311383 | Training R2 0.365315 | Validation loss 16.984724 | Validation R2 0.295328
Best loss 16.984724 | Best epoch 0018

100%##### 672/672 [01:40:00:00, 6.191t/s]
tensor([16.5402, 29.7475, 28.0376], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1600, 21.5600])

Epoch 0019 | Training loss 14.230635 | Training R2 0.451751 | Validation loss 15.854136 | Validation R2 0.386019
Best loss 15.854136 | Best epoch 0019

100%##### 672/672 [02:01:00:00, 5.511t/s]
tensor([19.7460, 42.1145, 20.2000, 14.1110, 37.0099, 25.5902, 11.4744, 34.7014,
        11.2551, 33.2510, 23.2312, 11.2077, 33.0895, 23.2144, 11.2046, 32.0959,
        23.1463, 11.2140, 32.9500, 23.3397, 11.3844, 32.9221, 23.4265, 11.5103,
        23.5026, 11.6663, 32.9310, 23.6521, 11.7840, 32.9144, 23.7639],
        grad_fn=<IndexBackward0>)
tensor([19.8400, 53.1050, 18.5150, 3.2922, 56.7650, 19.9600, 3.5506, 57.2050,
        3.5796, 56.8250, 19.9970, 3.5558, 56.0030, 19.9170, 3.5416, 56.1670,
        19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.8470, 3.5291,
        19.8520, 3.5300, 56.3440, 19.8300, 3.5261, 56.4400, 19.8400])

Epoch 0020 | Training loss 12.025496 | Training R2 0.608497 | Validation loss 13.721763 | Validation R2 0.540072
Best loss 13.721763 | Best epoch 0020

100%##### 672/672 [02:24:00:00, 4.661t/s]
tensor([11.1434, 49.1650, 26.2007, 12.7403], grad_fn=<IndexBackward0>)
tensor([ 0.4305, 64.0190, 10.8300, 2.4664])

Epoch 0021 | Training loss 12.230107 | Training R2 0.595061 | Validation loss 13.446256 | Validation R2 0.558356
Best loss 13.446256 | Best epoch 0021

100%##### 672/672 [02:30:00:00, 4.201t/s]
tensor([ 7.8498, 35.5636, 31.8140, 27.4297, 23.8109, 15.3497, 39.0910, 28.7233,
        18.5093, 41.4949, 30.0928, 19.0995, 41.0754, 38.6326, 20.1299, 38.6022,
        20.5340, 38.5935, 21.5521], grad_fn=<IndexBackward0>)
tensor([12.5700, 31.0440, 25.2520, 20.7650, 17.3300, 10.5840, 40.6700, 27.0730,
        13.9690, 43.5540, 24.6400, 15.0630, 44.0640, 35.6900, 15.2700, 35.8600,
        15.3300, 35.0950, 15.3590])

Epoch 0022 | Training loss 9.790716 | Training R2 0.740408 | Validation loss 12.751149 | Validation R2 0.602037
Best loss 12.751149 | Best epoch 0022

100%##### 672/672 [02:37:00:00, 4.281t/s]
tensor([14.1666, 61.5551, 29.6613, 8.0076, 58.0753, 24.2045, 8.0832],
        grad_fn=<IndexBackward0>)
tensor([ 6.2430, 65.0400, 25.1060, 4.2933, 69.2210, 23.5690, 4.5701])

Epoch 0023 | Training loss 8.497423 | Training R2 0.004519 | Validation loss 10.855521 | Validation R2 0.712147
Best loss 10.855521 | Best epoch 0023

100%##### 672/672 [02:45:00:00, 4.061t/s]
tensor([15.8495, 61.9667, 28.1403, 10.4408], grad_fn=<IndexBackward0>)
tensor([18.4370, 63.6710, 21.1050, 2.2930])

Epoch 0024 | Training loss 7.026572 | Training R2 0.066335 | Validation loss 7.219300 | Validation R2 0.072690
Best loss 7.219300 | Best epoch 0024

100%##### 672/672 [03:02:00:00, 3.681t/s]
tensor([15.0177, 53.2453, 22.2400, 13.1297, 52.0899, 24.2000],
        grad_fn=<IndexBackward0>)
tensor([20.1600, 53.7010, 19.0600, 3.5221, 56.3000, 20.1600])
```



```
Epoch 0025 | Training loss 22.096283 | Training R2 -0.321805 | Validation loss 31.622337 | Validation R2 -1.442631
Best loss 7.219388 | Best epoch 0024

100%##### 672/672 [02:59<00:00, 3.751t/s]
tensor([ 9.0573, 64.0458, 19.9370, 7.2607, 4.3328, 59.8810, 18.9035, 3.8537],
       grad_fn=<IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666])

Epoch 0026 | Training loss 6.403774 | Training R2 0.888980 | Validation loss 6.044273 | Validation R2 0.918760
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [02:57<00:00, 3.791t/s]
tensor([ 6.9223, 61.5160, 18.7082, 3.0362, 18.1905, 2.9401, 18.2441, 2.8033],
       grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2860, 2.0559])

Epoch 0027 | Training loss 6.205529 | Training R2 0.895747 | Validation loss 6.115032 | Validation R2 0.908659
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [02:57<00:00, 3.801t/s]
tensor([ 6.6958, 60.9784, 58.3774, 41.8519, 28.7659, 16.2084, 8.8678, 3.7320,
        2.6390], grad_fn=<IndexBackward0>)
tensor([10.7920, 67.0230, 58.2480, 40.4590, 28.8060, 18.4230, 11.9080, 6.6646,
        4.3127])

Epoch 0028 | Training loss 6.358976 | Training R2 0.898528 | Validation loss 5.888662 | Validation R2 0.915296
Best loss 5.888662 | Best epoch 0028

100%##### 672/672 [02:54<00:00, 3.851t/s]
tensor([ 5.4355, 52.7556, 12.8180, 2.5391], grad_fn=<IndexBackward0>)
tensor([ 1.6420, 52.8970, 9.8003, 1.9523])

Epoch 0029 | Training loss 6.320073 | Training R2 0.891863 | Validation loss 5.790334 | Validation R2 0.918101
Best loss 5.790334 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/run_train.py --fold 2 --model 1
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/run_train.py --fold 2 --model 1 --save_fold 2 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:28<00:00, 7.591t/s]
tensor([2.2012, 4.3401, 4.5154, 4.6905, 4.8404, 7.3129, 9.4333, 9.6325, 9.8317],
       grad_fn=<IndexBackward0>)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
        1.7166])

Epoch 0001 | Training loss 24.396061 | Training R2 -0.611271 | Validation loss 29.565437 | Validation R2 -1.135200
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.611t/s]
tensor([ 4.5868, 7.7243, 7.7393, 7.7542, 7.7692, 7.8141, 10.7971, 10.8420,
        10.8070, 13.8658, 13.9107, 13.9557, 16.8932, 16.9082, 16.9831, 19.9356,
        20.0105, 22.9630, 23.0279, 26.0379, 20.9479, 29.0370, 31.9429, 32.0378,
        34.8668, 34.9417, 37.7557, 37.8606], grad_fn=<IndexBackward0>)
tensor([12.5700, 31.8440, 25.2520, 20.7650, 17.3880, 10.5840, 40.6760, 22.8730,
        13.7690, 43.5540, 24.6400, 15.0530, 44.8460, 35.6960, 15.2700, 35.8460,
        15.3300, 35.8950, 15.3500, 15.2690, 43.9200, 15.2300, 35.5970, 15.2300,
        34.7690, 14.8850, 42.5860, 12.5700])

Epoch 0002 | Training loss 25.662014 | Training R2 -0.782833 | Validation loss 33.517918 | Validation R2 -1.744252
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.621t/s]
tensor([5.6275, 8.0024, 8.7686], grad_fn=<IndexBackward0>)
tensor([ 2.9348, 49.9070, 2.9348])

Epoch 0003 | Training loss 24.307240 | Training R2 -0.599560 | Validation loss 31.725603 | Validation R2 -1.458623
Best loss 29.565437 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.611t/s]
tensor([ 7.0766, 10.0451, 9.7717, 9.5309, 9.2409, 11.8985, 11.5903, 11.2770,
        11.0037], grad_fn=<IndexBackward0>)
tensor([ 0.7450, 40.8200, 9.9731, 3.1421, 0.8166, 40.8000, 10.0110, 2.6018,
        0.5197])

Epoch 0004 | Training loss 19.475636 | Training R2 -0.026063 | Validation loss 22.108311 | Validation R2 -0.193936
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.561t/s]
tensor([15.5276, 23.3250, 21.6143], grad_fn=<IndexBackward0>)
tensor([19.9220, 85.6310, 19.2020])

Epoch 0005 | Training loss 20.458645 | Training R2 -0.133138 | Validation loss 24.160664 | Validation R2 -0.425895
Best loss 22.108311 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.551t/s]
tensor([ 9.2572, 12.8956, 12.9740], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0006 | Training loss 17.644037 | Training R2 0.157199 | Validation loss 18.924053 | Validation R2 0.125221
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.571t/s]
tensor([ 6.5504, 14.4303, 14.2329, 14.0533, 13.2205, 12.6145, 11.7006, 11.1420],
       grad_fn=<IndexBackward0>)
tensor([ 1.0703, 24.1700, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0007 | Training loss 17.723608 | Training R2 0.149580 | Validation loss 19.722084 | Validation R2 0.049086
Best loss 18.924053 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.541t/s]
tensor([17.9146, 28.9038, 27.0520, 23.5514, 30.4003, 28.1000, 23.7917, 29.1836,
        26.0859, 21.4609, 25.4309, 22.4455, 17.6895, 16.8170, 19.2722],
       grad_fn=<IndexBackward0>)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4890, 19.8330, 2.0444, 57.7000,
        16.2300, 1.6738, 44.0250, 12.3930, 1.8120, 1.2775, 17.6690])

Epoch 0008 | Training loss 16.804079 | Training R2 0.228237 | Validation loss 18.234676 | Validation R2 0.187794
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:28<00:00, 7.551t/s]
tensor([17.3961, 35.1640, 32.7383], grad_fn=<IndexBackward0>)
tensor([ 7.2340, 79.9040, 30.3950])

Epoch 0009 | Training loss 17.305775 | Training R2 0.189205 | Validation loss 20.149047 | Validation R2 0.008224
Best loss 18.234676 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.541t/s]
tensor([ 0.9194, 2.6580, 2.2602, 1.8612, 1.4610, -0.2532, -1.1996, -1.9260,
        -2.2793], grad_fn=<IndexBackward0>)
tensor([0.3554, 5.3200, 4.0322, 3.2185, 2.6321, 1.2520, 0.7242, 0.3492, 0.2020])

Epoch 0010 | Training loss 16.073269 | Training R2 0.300581 | Validation loss 18.079575 | Validation R2 0.201553
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.531t/s]
tensor([21.2469, 44.4680, 39.3766, 29.7086, 36.6719, 24.5128],
       grad_fn=<IndexBackward0>)
tensor([20.1000, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441])

Epoch 0011 | Training loss 16.631909 | Training R2 0.251111 | Validation loss 19.968565 | Validation R2 0.025990
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.511t/s]
tensor([ -0.2112, 9.6766, 8.9151, 3.7237, 1.2923], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0012 | Training loss 16.117798 | Training R2 0.296700 | Validation loss 19.300783 | Validation R2 0.089291
Best loss 18.079575 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.491t/s]
tensor([ 8.1193, 28.2361, 13.4984], grad_fn=<IndexBackward0>)
tensor([ 2.9348, 49.9070, 2.9348])

Epoch 0013 | Training loss 15.069706 | Training R2 0.385193 | Validation loss 17.507060 | Validation R2 0.244393
Best loss 17.507060 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.481t/s]
tensor([28.5283, 47.7753, 46.5215, 45.2703, 44.0210, 39.0541, 35.3557, 30.4602,
        26.8148, 23.1959, 40.9320, 28.8364, 19.7065, 14.5903],
       grad_fn=<IndexBackward0>)
tensor([50.4030, 47.4530, 35.8760, 28.7700, 23.7300, 11.0000, 7.0637, 3.5658,
        2.1356, 1.2790, 48.6290, 12.1000, 3.6833, 1.3211])

Epoch 0014 | Training loss 13.840353 | Training R2 0.401411 | Validation loss 15.000102 | Validation R2 0.303305
Best loss 15.000102 | Best epoch 0014

100%##### 672/672 [01:30<00:00, 7.451t/s]
tensor([19.5747, 57.5473, 43.1012, 17.4068, 42.4553, 25.7003, 14.2406, 30.5511,
        15.0762, 24.2100, 19.7464], grad_fn=<IndexBackward0>)
tensor([17.5830, 71.0050, 22.2940, 2.9600, 49.2230, 14.1200, 2.9076, 52.3500,
        3.1770, 44.7320, 17.5830])

Epoch 0015 | Training loss 13.451623 | Training R2 0.510133 | Validation loss 15.470939 | Validation R2 0.414735
```

```
Best loss 15.478939 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([15.3398, 40.8979, 27.4991, 6.8975, 27.3409, 16.6550],
       grad_fn=<IndexBackward0>)
tensor([15.6310, 53.5120, 15.1840, 1.6724, 54.8710, 15.6310])

Epoch 0016 | Training loss 12.981250 | Training R2 0.543793 | Validation loss 14.996788 | Validation R2 0.450628
Best loss 14.996788 | Best epoch 0016

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([20.6242, 87.1770, 56.6517], grad_fn=<IndexBackward0>)
tensor([12.6410, 93.0030, 31.3750])

Epoch 0017 | Training loss 12.344368 | Training R2 0.587459 | Validation loss 14.482932 | Validation R2 0.493276
Best loss 14.482932 | Best epoch 0017

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([ 5.8743, 33.4952, 14.7181, 2.2171, -1.6118, -3.1793, 19.0814, 7.9290,
        2.0781, -3.3863, 6.3080, 0.5193, -5.8548], grad_fn=<IndexBackward0>)
tensor([ 3.4332, 50.3360, 16.1560, 3.8981, 1.9895, 1.3372, 50.8530, 13.6580,
        5.6217, 1.3536, 19.2430, 5.5348, 1.1154])

Epoch 0018 | Training loss 11.731128 | Training R2 0.627429 | Validation loss 13.635745 | Validation R2 0.545820
Best loss 13.635745 | Best epoch 0018

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([ 9.1925, 60.4866, 25.4927, 2.9691, 22.6411, 3.5867, 18.8998, 2.9576,
        16.7243, 2.9704], grad_fn=<IndexBackward0>)
tensor([ 2.8389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0559,
        15.0810, 2.0309])

Epoch 0019 | Training loss 11.256901 | Training R2 0.656943 | Validation loss 13.020782 | Validation R2 0.585863
Best loss 13.020782 | Best epoch 0019

100%##### 672/672 [01:33<00:00, 7.19it/s]
tensor([13.8924, 49.3759, 17.0067, 2.1433, 32.8296, 15.3211, 1.6264],
       grad_fn=<IndexBackward0>)
tensor([14.0340, 52.5400, 13.3690, 1.8996, 54.8650, 14.0150, 1.9913])

Epoch 0020 | Training loss 10.266763 | Training R2 0.714638 | Validation loss 12.052997 | Validation R2 0.645138
Best loss 12.052997 | Best epoch 0020

100%##### 672/672 [01:34<00:00, 7.09it/s]
tensor([ 1.2734, 12.3216, -0.8398, 9.7799, 0.8759], grad_fn=<IndexBackward0>)
tensor([0.1803, 6.0826, 0.1879, 5.1060, 0.1803])

Epoch 0021 | Training loss 9.368041 | Training R2 0.762411 | Validation loss 10.987734 | Validation R2 0.705092
Best loss 10.987734 | Best epoch 0021

100%##### 672/672 [01:37<00:00, 6.87it/s]
tensor([ 2.8928, 7.5500, 1.0634, -2.5524, 21.9355, 8.8222, 1.5529, -0.8570,
        -1.7677, 0.2143, 4.1006, -1.0089], grad_fn=<IndexBackward0>)
tensor([ 3.7684, 12.6090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0281, 2.6854,
        1.9625, 15.0930, 0.8548, 1.9640])

Epoch 0022 | Training loss 8.574180 | Training R2 0.800972 | Validation loss 9.521894 | Validation R2 0.778529
Best loss 9.521894 | Best epoch 0022

100%##### 672/672 [01:42<00:00, 6.53it/s]
tensor([11.6306, 63.7290, 21.1029, 1.9694, 50.4705, 22.5500, 4.1765, 49.5800,
        23.0913, 11.2773, 6.1622], grad_fn=<IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2978, 62.7360,
        19.2460, 7.4859, 3.3370])

Epoch 0023 | Training loss 8.035305 | Training R2 0.825203 | Validation loss 9.607819 | Validation R2 0.774552
Best loss 9.521894 | Best epoch 0022

100%##### 672/672 [01:58<00:00, 5.66it/s]
tensor([ 6.3880, 14.1343, 2.3735, 29.4463, 13.7770, 2.6396, 30.1243, 13.3924,
        2.9050, 30.8156, 13.5442, 3.0128, 30.5357, 13.4501],
       grad_fn=<IndexBackward0>)
tensor([ 9.0032, 9.6259, 0.6383, 43.8578, 9.7042, 0.6435, 44.0790, 9.7534,
        0.6467, 44.4320, 9.8362, 0.6522, 44.3040, 9.8032])

Epoch 0024 | Training loss 7.263038 | Training R2 0.857188 | Validation loss 8.324299 | Validation R2 0.830736
Best loss 8.324299 | Best epoch 0024

100%##### 672/672 [02:15<00:00, 4.95it/s]
tensor([26.6158, 57.6124], grad_fn=<IndexBackward0>)
tensor([47.6150, 46.0300])

Epoch 0025 | Training loss 6.618134 | Training R2 0.881423 | Validation loss 6.747346 | Validation R2 0.888792
Best loss 6.747346 | Best epoch 0025

100%##### 672/672 [02:24<00:00, 4.65it/s]
tensor([ 8.1440, 64.3160, 18.0991, 0.7626, 17.8471, 1.6511, 16.7843, 1.7408,
        16.2581, 1.1391], grad_fn=<IndexBackward0>)
tensor([ 2.8389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0559,
        15.0810, 2.0309])

Epoch 0026 | Training loss 6.682505 | Training R2 0.879105 | Validation loss 6.442039 | Validation R2 0.898628
Best loss 6.442039 | Best epoch 0026

100%##### 672/672 [02:26<00:00, 4.52it/s]
tensor([ 3.0113, 11.6365, 1.9527], grad_fn=<IndexBackward0>)
tensor([2.0948, 9.5297, 2.0948])

Epoch 0027 | Training loss 6.799114 | Training R2 0.874049 | Validation loss 6.605771 | Validation R2 0.893410
Best loss 6.442039 | Best epoch 0026

100%##### 672/672 [02:31<00:00, 4.43it/s]
tensor([10.0965, 64.9965, 18.0683, 2.7577, 49.3049, 19.3117, 7.8974, 5.1164],
       grad_fn=<IndexBackward0>)
tensor([ 4.0299, 69.1500, 18.3400, 1.7573, 53.2860, 17.7690, 5.0245, 1.7018])

Epoch 0028 | Training loss 7.477236 | Training R2 0.848640 | Validation loss 9.610397 | Validation R2 0.774393
Best loss 6.442039 | Best epoch 0026

100%##### 672/672 [02:33<00:00, 4.38it/s]
tensor([ 6.7122, 47.8820, 13.4944, 2.2469], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0029 | Training loss 6.323672 | Training R2 0.891740 | Validation loss 5.862009 | Validation R2 0.916061
Best loss 5.862009 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 2 --model 2 --save fold_2 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:27<00:00, 7.69it/s]
tensor([ 2.1615, 4.8593, 5.0546, 5.4167, 7.8210, 8.3762, 10.8642, 11.1145,
        11.2536, 13.7084, 14.0907], grad_fn=<IndexBackward0>)
tensor([ 7.7450, 46.1910, 15.8090, 2.9155, 46.6330, 2.9900, 18.0300, 5.5715,
        2.9028, 17.7490, 2.0574])

Epoch 0001 | Training loss 25.062193 | Training R2 -0.700463 | Validation loss 31.127050 | Validation R2 -1.366714
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.70it/s]
tensor([4.8309, 7.9815, 8.0795, 8.1939], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0002 | Training loss 25.686121 | Training R2 -0.786184 | Validation loss 33.511566 | Validation R2 -1.743212
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.53it/s]
tensor([10.7076, 14.7278, 14.7281, 14.7284, 14.7289, 14.7298, 14.7307, 14.7318,
        14.7326], grad_fn=<IndexBackward0>)
tensor([10.7920, 67.0230, 50.2400, 40.4590, 28.0060, 18.4230, 11.9080, 6.6646,
        4.3127])

Epoch 0003 | Training loss 24.546181 | Training R2 -0.631151 | Validation loss 32.111191 | Validation R2 -1.518737
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.71it/s]
tensor([3.3200, 0.1569], grad_fn=<IndexBackward0>)
tensor([ 2.4489, 16.6950])

Epoch 0004 | Training loss 22.813705 | Training R2 -0.409032 | Validation loss 29.552938 | Validation R2 -1.133395
Best loss 29.552938 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.63it/s]
tensor([2.0743, 3.6092, 2.5640, 4.4302, 3.1701, 2.7690, 2.3375, 1.7664, 1.4013],
       grad_fn=<IndexBackward0>)
tensor([0.0492, 5.6725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4770, 0.1072, 0.0927])

Epoch 0005 | Training loss 18.439297 | Training R2 0.079513 | Validation loss 20.436989 | Validation R2 -0.020243
Best loss 20.436989 | Best epoch 0005

100%##### 672/672 [01:27<00:00, 7.65it/s]
tensor([14.8184, 21.9938, 21.1540, 19.1529, 25.6132, 24.3171, 21.8638, 28.2239,
        26.0449, 23.5441, 29.0066, 27.8578, 24.1761], grad_fn=<IndexBackward0>)
```

```
tensor([ 6.2430, 65.8400, 25.1860, 4.2933, 69.2210, 23.5690, 4.5781, 68.7910,
        23.4760, 4.5602, 68.2770, 23.3020, 4.5263])

Epoch 0006 | Training loss 17.760878 | Training R2 0.166000 | Validation loss 19.276941 | Validation R2 0.092292
Best loss 19.276941 | Best epoch 0006

100%##### 672/672 [01:20<00:00, 7.611t/s]
tensor([ 7.2685, 17.8126, 17.6222, 17.4313, 16.6626, 16.0886, 15.2971, 14.1049,
        19.7325, 18.0599, 16.3651], grad_fn=IndexBackward0>)
tensor([ 0.4137, 29.3630, 21.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
        39.4790, 6.4477, 1.1231])

Epoch 0007 | Training loss 17.224649 | Training R2 0.196787 | Validation loss 18.606171 | Validation R2 0.154363
Best loss 18.606171 | Best epoch 0007

100%##### 672/672 [01:20<00:00, 7.611t/s]
tensor([ 8.3400, 18.9009, 17.0770, 13.5076, 19.1425, 16.7560, 12.2467, 17.5037,
        15.0191, 9.3061, 14.1035, 11.0100], grad_fn=IndexBackward0>)
tensor([ 4.9161, 42.0730, 5.4589, 60.7050, 39.7010, 5.1625, 0.1270, 38.5530,
        6.6617, 0.1233, 37.8370, 4.9161])

Epoch 0008 | Training loss 16.808960 | Training R2 0.235089 | Validation loss 18.387007 | Validation R2 0.174167
Best loss 18.387007 | Best epoch 0008

100%##### 672/672 [01:27<00:00, 7.651t/s]
tensor([ 5.5405, 18.0450, 15.2522, 13.2369, 12.8317, 18.4610, 14.6605, 11.4213,
        11.0037, 18.3732, 16.1442, 13.0661, 11.2020, 9.0967, 9.6595],
        grad_fn=IndexBackward0>)
tensor([ 9.8083, 13.5140, 3.7950, 1.5319, 1.2770, 13.2800, 3.7295, 1.2557,
        3.7290, 1.5053, 1.2555, 13.1880, 3.7035, 1.4950, 1.2470])

Epoch 0009 | Training loss 16.176075 | Training R2 0.291605 | Validation loss 17.658400 | Validation R2 0.238313
Best loss 17.658400 | Best epoch 0009

100%##### 672/672 [01:27<00:00, 7.641t/s]
tensor([ 4.4795, 11.8215, 9.0239, 6.1657, 12.2526, 8.1955, 6.0050, 5.2888,
        5.0226], grad_fn=IndexBackward0>)
tensor([ 3.7684, 12.0090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6054,
        1.9625])

Epoch 0010 | Training loss 15.784349 | Training R2 0.325499 | Validation loss 17.559269 | Validation R2 0.246048
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.611t/s]
tensor([12.7334, 35.1197, 29.4521, 23.7096, 18.7326, 32.3226, 24.1075],
        grad_fn=IndexBackward0>)
tensor([15.0620, 56.9590, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0011 | Training loss 19.306719 | Training R2 -0.009128 | Validation loss 25.415319 | Validation R2 -0.577833
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.611t/s]
tensor([32.0389, 42.7443, 41.9388, 41.1327, 39.5190, 37.9050, 47.3776, 44.0538,
        40.7275, 49.5277, 43.0861, 41.0659, 49.2414, 39.0080, 46.0657, 34.0696,
        42.4265, 29.7071, 36.3032, 27.1146, 31.6529, 26.3207, 30.2590, 25.4065],
        grad_fn=IndexBackward0>)
tensor([58.5520, 41.9500, 32.6790, 27.1470, 20.1960, 15.4500, 55.2420, 32.3270,
        21.5020, 60.6200, 31.3470, 24.0360, 61.0120, 24.6620, 62.3610, 24.9130,
        62.5810, 25.0130, 62.4200, 24.9640, 62.3850, 24.9450, 62.3600, 24.9370])

Epoch 0012 | Training loss 15.314219 | Training R2 0.365000 | Validation loss 18.021051 | Validation R2 0.206713
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:28<00:00, 7.591t/s]
tensor([ 0.5000, 2.0243, 1.2000, 0.5755, 0.0550, -1.1100, -1.4000, -1.7001,
        -1.9126, -2.0494, -1.1390, -1.4614, -1.5440, -1.7204, -1.9236],
        grad_fn=IndexBackward0>)
tensor([0.1027, 4.3675, 3.3207, 2.6709, 2.2190, 1.1160, 0.6720, 0.3420, 0.2066,
        0.1245, 4.4627, 1.1442, 0.0164, 0.3513, 0.1277])

Epoch 0013 | Training loss 14.627570 | Training R2 0.420740 | Validation loss 16.876558 | Validation R2 0.304275
Best loss 16.876558 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.531t/s]
tensor([ 8.0011, 44.5529, 42.7156, 40.0027, 31.7029, 26.4010, 19.3116, 9.0406,
        38.4039, 23.2554, 15.9224, 11.0409, 20.7719, 15.0965, 11.2353, 18.4193,
        15.1102, 12.0790, 18.1327, 16.0533, 15.1004, 19.4565, 18.0770, 16.5790,
        18.9620], grad_fn=IndexBackward0>)
tensor([ 4.2077, 59.4320, 44.9050, 38.1200, 14.2500, 7.9220, 3.6106, 1.1171,
        59.4090, 17.3990, 4.4157, 1.1207, 17.1950, 4.3640, 1.1075, 17.2010,
        4.3056, 1.1130, 16.0630, 5.2057, 1.0061, 16.0560, 4.2779, 1.0057,
        4.2077])

Epoch 0014 | Training loss 13.552494 | Training R2 0.502758 | Validation loss 15.915753 | Validation R2 0.381237
Best loss 15.915753 | Best epoch 0014

100%##### 672/672 [01:29<00:00, 7.521t/s]
tensor([ 4.4902, 21.3597, 5.1706], grad_fn=IndexBackward0>)
tensor([ 4.6703, 20.6600, 3.0425])

Epoch 0015 | Training loss 13.312044 | Training R2 0.520246 | Validation loss 15.572647 | Validation R2 0.407628
Best loss 15.572647 | Best epoch 0015

100%##### 672/672 [01:29<00:00, 7.471t/s]
tensor([ 5.1430, 0.7150, 5.2335, 17.3050, 10.0000, 9.1330, 17.2020, 10.6096,
        10.4114], grad_fn=IndexBackward0>)
tensor([ 8.4665, 2.6600, 2.2691, 10.5760, 3.2225, 2.3435, 25.5770, 3.2261,
        2.3462])

Epoch 0016 | Training loss 12.642657 | Training R2 0.567281 | Validation loss 14.518663 | Validation R2 0.485100
Best loss 14.518663 | Best epoch 0016

100%##### 672/672 [01:30<00:00, 7.451t/s]
tensor([ 8.6450, 39.9100, 19.5235, 1.5690, 25.0519, 13.4577, 2.6799],
        grad_fn=IndexBackward0>)
tensor([ 2.9463, 47.9160, 16.4030, 2.7004, 0.12510, 15.3770, 2.9173])

Epoch 0017 | Training loss 12.009523 | Training R2 0.609536 | Validation loss 13.955099 | Validation R2 0.524243
Best loss 13.955099 | Best epoch 0017

100%##### 672/672 [01:30<00:00, 7.391t/s]
tensor([16.5260, 53.2245, 25.6311, 4.3723, 32.4923, 17.3050, 3.0944, 25.6400,
        15.9050, 4.0992], grad_fn=IndexBackward0>)
tensor([12.3700, 69.3770, 19.4920, 2.1362, 60.1120, 16.1970, 2.1042, 46.9250,
        16.0400, 2.1070])

Epoch 0018 | Training loss 11.491714 | Training R2 0.642401 | Validation loss 14.003904 | Validation R2 0.520958
Best loss 13.955099 | Best epoch 0017

100%##### 672/672 [01:31<00:00, 7.311t/s]
tensor([12.2800, 60.9434, 23.6940, 3.7652, 41.1423, 23.2139, 4.3050, 37.7644,
        21.6612, 10.9115, 4.7921, 33.1001, 17.9507, 9.4201, 4.5705],
        grad_fn=IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2970, 62.7360,
        19.2460, 7.4059, 3.3370, 62.9420, 16.0690, 6.5660, 3.3492])

Epoch 0019 | Training loss 10.620493 | Training R2 0.694636 | Validation loss 12.171548 | Validation R2 0.630123
Best loss 12.171548 | Best epoch 0019

100%##### 672/672 [01:32<00:00, 7.231t/s]
tensor([17.7791, 60.7902, 21.0121, 3.3622, 36.1535, 18.7510, 3.0016, 34.5173,
        18.5345, 3.7166], grad_fn=IndexBackward0>)
tensor([13.0520, 73.2500, 25.4040, 4.4009, 62.0640, 23.5240, 4.7517, 62.2630,
        23.0030, 4.7676])

Epoch 0020 | Training loss 9.667159 | Training R2 0.746996 | Validation loss 11.243977 | Validation R2 0.691177
Best loss 11.243977 | Best epoch 0020

100%##### 672/672 [01:30<00:00, 7.071t/s]
tensor([ 6.4277, 43.0652, 10.0547, 0.0505], grad_fn=IndexBackward0>)
tensor([ 1.7700, 53.9210, 16.2500, 5.2152])

Epoch 0021 | Training loss 9.009152 | Training R2 0.700266 | Validation loss 9.970053 | Validation R2 0.756001
Best loss 9.970053 | Best epoch 0021

100%##### 672/672 [01:30<00:00, 6.831t/s]
tensor([ 7.1529, 44.6963, 12.5524, 2.6736, -0.6070, -1.0314, 12.0853, 3.2542,
        0.2715, -0.0505, 10.7207, 4.6728, 1.5571, 0.3930],
        grad_fn=IndexBackward0>)
tensor([ 5.1025, 40.9070, 16.9700, 6.3620, 3.6307, 2.7427, 18.1490, 6.0004,
        3.0000, 2.9310, 14.1770, 7.0320, 4.0310, 3.0316])

Epoch 0022 | Training loss 8.104401 | Training R2 0.822100 | Validation loss 8.880013 | Validation R2 0.007035
Best loss 8.880013 | Best epoch 0022

100%##### 672/672 [01:43<00:00, 6.471t/s]
tensor([ 0.0191, 62.1300, 0.5210, -0.0926, 2.4311], grad_fn=IndexBackward0>)
tensor([ 2.7853, 66.9550, 2.7495, 2.3342, 2.7853])

Epoch 0023 | Training loss 8.010061 | Training R2 0.826300 | Validation loss 9.601102 | Validation R2 0.771057
Best loss 8.880013 | Best epoch 0022

100%##### 672/672 [01:56<00:00, 5.771t/s]
tensor([ 3.4122, 6.5300, 0.7621, -1.5433, 25.0093, 7.9504, 1.0056, -0.6040,
        -1.0974, 7.6004, 3.0400, -1.3320, 15.0097, 3.6924, -0.7531, -1.4107,
        17.0910, 4.1631, -0.1990, -1.6500, 11.6507, -1.1651, -2.1033, 22.0726,
        5.4300, -0.3000, -2.2707, 23.2500, 5.2173, -0.0715, -2.5706, 21.4615,
        3.5346, -1.2039, -2.7002, 20.7264, 1.0163, -2.2834],
        grad_fn=IndexBackward0>)
tensor([ 3.7004, 12.0090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6054,
        1.9625, 15.0020, 8.0540, 1.9640, 29.0970, 9.7026, 3.2372, 2.0224,
        33.9450, 11.2970, 4.4000, 2.0129, 24.7420, 3.7004, 2.0126, 40.9190,
        15.4500, 5.1565, 2.0125, 40.9190, 15.4500, 5.1565, 2.0125, 40.9190,
        13.2120, 5.1565, 2.0125, 40.9190, 11.2970, 3.7004])

Epoch 0024 | Training loss 7.332051 | Training R2 0.854441 | Validation loss 7.375947 | Validation R2 0.067100
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:15<00:00, 4.971t/s]
```

```
tensor([17.5115, 75.5686, 24.1151, 5.0300, 47.8906, 15.6807, 4.7381, 48.6322,
        3.4479, 40.0268, 15.2362], grad_fn=<IndexBackward0>)
tensor([17.5830, 71.0850, 22.2940, 2.9600, 49.2230, 14.1200, 2.9876, 52.3580,
        3.1778, 44.7330, 17.5830])

Epoch 0025 | Training loss 8.509421 | Training R2 0.089367 | Validation loss 9.115965 | Validation R2 0.797810
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:22<00:00, 4.721it/s]
tensor([ 9.7409, 43.1830, 37.0272, 24.0184, 12.7075, 8.0704, 4.5794, 2.5680,
        37.6630, 14.1537, 6.5239, 4.7297, 40.0373, 15.7862, 7.8193, 6.2941,
        41.6687, 24.4670, 7.7723, 7.5809, 42.2466, 14.8580, 10.3533, 8.6096,
        42.5099, 18.5460, 11.0454, 9.2425, 43.5308, 17.5699, 11.5147, 9.8455,
        44.1187, 19.8935, 11.9677, 10.3997, 44.8435, 20.4890],
        grad_fn=<IndexBackward0>)
tensor([12.5050, 42.0500, 34.8410, 24.5230, 12.4040, 7.4420, 3.7669, 1.3563,
        42.1990, 12.2400, 2.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3305,
        43.0630, 20.0330, 1.9210, 1.3667, 43.0860, 8.0969, 3.7979, 1.3674,
        42.5300, 12.3470, 3.7496, 1.3500, 42.9850, 10.5230, 3.7888, 1.3642,
        43.0840, 12.5050, 3.7977, 1.3674, 43.0840, 12.5050])

Epoch 0026 | Training loss 7.642862 | Training R2 0.041860 | Validation loss 9.652371 | Validation R2 0.772418
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:25<00:00, 4.621it/s]
tensor([ 8.1295, 16.1995, 3.0024, 30.7570, 16.0040], grad_fn=<IndexBackward0>)
tensor([12.0470, 12.6800, 1.0025, 53.5960, 12.0470])

Epoch 0027 | Training loss 6.217919 | Training R2 0.095331 | Validation loss 6.709231 | Validation R2 0.090045
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:29<00:00, 4.501it/s]
tensor([ 2.9591, 16.0022, 0.4070, 41.0720, 13.1140, 0.7645, 43.0057, 15.5036,
        2.9454, 1.1200, 3.8609, 1.5330, 17.2710, 4.1735, 2.0491,
        5.0674, 2.6229, 7.1752, 3.4310, 51.3981, 6.0681, 3.6774, 0.0776,
        4.6272, 41.4533, 7.2080, 4.7510], grad_fn=<IndexBackward0>)
tensor([ 0.9807, 13.2440, 1.0495, 44.2720, 11.1530, 1.0742, 43.9160, 13.4300,
        2.0234, 1.0049, 12.6900, 3.2420, 1.0064, 15.4190, 3.2307, 1.0054,
        3.3101, 1.0273, 4.0677, 1.0220, 53.4230, 3.3111, 1.0275, 4.0942,
        1.0283, 40.7690, 3.0721, 0.9807])

Epoch 0028 | Training loss 6.206502 | Training R2 0.095715 | Validation loss 7.057861 | Validation R2 0.078321
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:30<00:00, 4.461it/s]
tensor([ 7.6626, 77.2475, 59.0001, 40.7603, 39.5699, 12.5270, 0.4092, -2.0569,
        -3.5050, 59.4931, 14.3282, 1.8460, -1.0112, 59.4113, 14.9600, 2.1440,
        -0.3403, 60.1407, 15.7402, 2.9394, 0.9200], grad_fn=<IndexBackward0>)
tensor([ 1.7195, 93.2850, 73.9670, 62.0350, 53.2360, 26.3850, 11.4010, 7.5733,
        4.9950, 75.1950, 26.9070, 10.1920, 5.0947, 73.8930, 26.4440, 10.0160,
        5.0009, 74.0470, 26.5200, 10.0400, 5.0220])

Epoch 0029 | Training loss 5.844729 | Training R2 0.007518 | Validation loss 5.710409 | Validation R2 0.928344
Best loss 5.710409 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 2 --model 3 --save_fold 2 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:27<00:00, 7.611it/s]
tensor([ 2.0156, 6.4742, 6.6527, 6.8312, 6.9842, 10.4004, 10.6580],
        grad_fn=<IndexBackward0>)
tensor([15.0620, 56.9590, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0001 | Training loss 25.589478 | Training R2 -0.772768 | Validation loss 32.346756 | Validation R2 -1.555826
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.661it/s]
tensor([1.9030, 5.0573, 5.0573, 5.0573, 5.1375, 5.1977], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.0730, 0.0292, 0.1817])

Epoch 0002 | Training loss 25.551172 | Training R2 -0.767465 | Validation loss 33.349023 | Validation R2 -1.716795
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.651it/s]
tensor([ 5.5753, 9.1960, 9.1970, 9.0600, 12.3600, 12.3259, 12.2029,
        12.2400, 15.6801, 15.6373, 15.5945, 15.8579, 10.8076, 10.8440, 10.8021,
        10.7654, 22.0056, 22.0029, 21.9001, 21.9435, 25.1256, 25.0029, 25.0402,
        25.0036, 20.1739, 20.1312, 20.0000, 20.0000, 31.1455, 31.1029, 31.0403,
        31.0230, 34.1763, 34.1337, 34.0912, 34.0547, 37.1030, 37.0544, 37.0118,
        40.1939, 40.1514, 40.1089, 40.0725, 43.2250, 43.1825, 43.1401, 43.1036,
        46.1381, 46.0957, 46.0532, 46.0108, 48.9333, 48.8909, 48.8121, 51.7009,
        51.6585, 51.6222, 54.7001, 54.6392, 57.7422, 57.6999, 57.6637],
        grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2013,
        1.6046, 42.0210, 13.2600, 4.4600, 1.7501, 41.6500, 12.9000, 4.3470,
        1.7105, 41.2450, 12.7000, 4.3043, 1.6937, 39.0740, 12.3400, 4.1591,
        1.6366, 39.6830, 12.2800, 4.1380, 1.6285, 38.6890, 11.9800, 4.0377,
        1.5800, 39.3970, 12.2020, 4.1090, 1.6174, 16.2800, 4.6939, 1.5010,
        39.7100, 12.3040, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 4.6102,
        37.9910, 11.7700, 3.9642, 1.5590, 36.4990, 11.3100, 1.4909, 11.3470,
        3.8219, 1.5030, 39.1100, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0003 | Training loss 25.064499 | Training R2 -0.700776 | Validation loss 33.287090 | Validation R2 -1.706504
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.631it/s]
tensor([11.9925, 16.1007, 15.6565, 14.7926, 10.7813, 10.1950, 17.1649],
        grad_fn=<IndexBackward0>)
tensor([13.0520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517])

Epoch 0004 | Training loss 19.500549 | Training R2 -0.037956 | Validation loss 22.115347 | Validation R2 -0.194696
Best loss 22.115347 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.611it/s]
tensor([11.7457, 16.1820, 15.2492], grad_fn=<IndexBackward0>)
tensor([10.2960, 46.2360, 13.6630])

Epoch 0005 | Training loss 17.637089 | Training R2 0.157863 | Validation loss 18.753033 | Validation R2 0.140961
Best loss 18.753033 | Best epoch 0005

100%##### 672/672 [01:28<00:00, 7.591it/s]
tensor([10.9400, 25.6120, 24.2652, 21.7004, 27.7522, 26.0004, 22.9544, 20.0000,
        16.7267, 22.9611], grad_fn=<IndexBackward0>)
tensor([13.0520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517, 62.2630,
        23.0030, 4.7670])

Epoch 0006 | Training loss 17.212334 | Training R2 0.197937 | Validation loss 18.404135 | Validation R2 0.172628
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.601it/s]
tensor([ 7.4000, 16.4973, 14.5521, 12.0453, 11.0909, 10.0030, 14.5344, 11.6942,
        9.5200, 9.1614], grad_fn=<IndexBackward0>)
tensor([ 0.4160, 30.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944,
        0.4453, 0.3530])

Epoch 0007 | Training loss 18.241096 | Training R2 0.099195 | Validation loss 21.649376 | Validation R2 -0.144082
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.571it/s]
tensor([21.2631, 37.7960, 34.6909, 20.8175, 35.9441, 20.1752, 40.1245, 34.2910,
        23.3075, 27.6585, 19.4056, 23.0779, 19.0806, 24.1141, 21.9171],
        grad_fn=<IndexBackward0>)
tensor([20.1000, 76.4000, 23.3070, 3.2069, 20.0640, 3.3441, 70.0070, 24.2140,
        3.3317, 23.0640, 3.2036, 23.7020, 3.2723, 61.1610, 20.1000])

Epoch 0008 | Training loss 15.000021 | Training R2 0.317229 | Validation loss 17.267464 | Validation R2 0.271672
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:20<00:00, 7.591it/s]
tensor([29.5514, 33.9470, 33.5019, 33.0550, 31.7000, 36.2072, 34.6201, 32.9500,
        35.4917, 33.4942, 37.0410, 33.2047, 37.4423, 32.1499, 36.2251, 30.2793,
        34.2453, 27.6422, 31.5599, 24.2530, 28.0946, 21.0433, 24.2154],
        grad_fn=<IndexBackward0>)
tensor([66.9750, 34.8300, 30.4050, 27.1220, 19.3810, 59.4210, 39.4690, 20.2220,
        45.4640, 32.5130, 71.1690, 34.2430, 72.7160, 35.0360, 72.9000, 35.1970,
        73.1260, 35.2700, 73.7120, 35.5420, 73.9550, 35.6600, 66.9750])

Epoch 0009 | Training loss 15.588125 | Training R2 0.342165 | Validation loss 17.531309 | Validation R2 0.249244
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:20<00:00, 7.581it/s]
tensor([22.3980, 44.0035, 38.3123, 27.5719, 42.2500, 33.7127, 17.0093, 31.7060,
        21.5951, 15.1004, 21.0000, 10.1960, 14.7075, 19.6320, 17.6300, 14.6714,
        10.9939, 17.1625, 14.7096, 10.3896, 16.0003, 14.2772, 17.6625, 10.0937,
        14.1760, 16.9202, 15.6259, 13.6600, 16.4270, 15.1700],
        grad_fn=<IndexBackward0>)
tensor([22.0000, 73.4140, 23.4000, 3.5402, 76.4500, 24.6100, 3.7109, 76.3100,
        24.5840, 3.7130, 76.0510, 21.1000, 3.7013, 75.0210, 24.4220, 3.6093,
        74.9130, 24.1510, 3.6403, 73.3630, 23.6320, 3.5700, 72.1350, 23.2310,
        3.5094, 70.4750, 19.6300, 3.4295, 70.9020, 22.0000])

Epoch 0010 | Training loss 15.053199 | Training R2 0.306539 | Validation loss 16.905653 | Validation R2 0.301074
```

Best loss 16.985653 | Best epoch 0010

100%##### 672/672 [01:20<00:00, 7.551t/s]
tensor([[18.1234, 47.1816, 39.9245], grad_fn=IndexBackward0])
tensor([7.2340, 79.9040, 38.3950])

Epoch 0011 | Training loss 14.768456 | Training R2 0.409528 | Validation loss 16.615559 | Validation R2 0.325627
Best loss 16.615559 | Best epoch 0011

100%##### 672/672 [01:20<00:00, 7.541t/s]
tensor([[11.6720, 32.8382, 24.0419, 7.9924, 23.3818, 12.4458, 8.1120, 14.4407,
11.5844, 8.4578], grad_fn=IndexBackward0])
tensor([7.1280, 48.3090, 16.0790, 2.5597, 40.2000, 10.9370, 2.6928, 34.4200,
12.7210, 2.7225])

Epoch 0012 | Training loss 14.076530 | Training R2 0.463561 | Validation loss 15.982708 | Validation R2 0.376014
Best loss 15.982708 | Best epoch 0012

100%##### 672/672 [01:29<00:00, 7.511t/s]
tensor([[15.4169, 37.7430, 26.4691, 7.0804, 27.0834, 15.1891],
grad_fn=IndexBackward0])
tensor([[15.6310, 53.5120, 15.1840, 1.6724, 54.8710, 15.6310]])

Epoch 0013 | Training loss 13.712152 | Training R2 0.490973 | Validation loss 15.644684 | Validation R2 0.482134
Best loss 15.644684 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.481t/s]
tensor([[12.0577, 36.3803, 23.6637, 11.4284, 3.9892, 24.7131, 13.2179, 7.2145,
3.9259, 17.6060, 11.4485, 7.1599, 4.1087, 14.8795, 10.1405, 7.4436,
5.7456, 12.6350, 10.5755, 8.8864, 7.3162, 13.0429, 11.0113, 9.6312,
8.1763, 13.7802, 12.8706, 10.3422, 8.4799, 14.8624, 12.3707],
grad_fn=IndexBackward0])
tensor([[15.8670, 48.0290, 15.0320, 5.2611, 2.1393, 49.5140, 15.6140, 5.4640,
2.2222, 49.5809, 15.6390, 5.4735, 2.2257, 49.6180, 15.6440, 5.4753,
2.2264, 49.5890, 15.6410, 5.4740, 2.2259, 49.5930, 15.6410, 4.7118,
2.2260, 49.5930, 15.6410, 5.4742, 2.2260, 50.3130, 15.8670])

Epoch 0014 | Training loss 13.242213 | Training R2 0.525266 | Validation loss 15.322500 | Validation R2 0.426506
Best loss 15.322500 | Best epoch 0014

100%##### 672/672 [01:30<00:00, 7.461t/s]
tensor([5.4798, 30.7803, 14.7806, 2.5093, -1.7806, 8.5024, 1.9989, -1.6791],
grad_fn=IndexBackward0])
tensor([1.7436, 45.8730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866])

Epoch 0015 | Training loss 12.924088 | Training R2 0.547802 | Validation loss 14.716954 | Validation R2 0.470939
Best loss 14.716954 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.411t/s]
tensor([[15.6168, 55.2221, 16.2939, 8.2661, 24.2609], grad_fn=IndexBackward0])
tensor([[16.1690, 59.8340, 5.3850, 1.4892, 16.1690]])

Epoch 0016 | Training loss 11.898344 | Training R2 0.616732 | Validation loss 14.322660 | Validation R2 0.498908
Best loss 14.322660 | Best epoch 0016

100%##### 672/672 [01:31<00:00, 7.351t/s]
tensor([[12.7216, 59.7177, 25.1669, 4.2772, 34.5799, 21.0603, 9.3700, 3.6991,
31.5247, 18.5400, 8.8705, 3.1359, 25.5747, 15.5161, 5.9220],
grad_fn=IndexBackward0])
tensor([4.0299, 69.1500, 18.3400, 1.7573, 53.2800, 17.7690, 5.0245, 1.7018,
65.7010, 28.9510, 4.9462, 1.6753, 64.1100, 17.0690, 4.8299])

Epoch 0017 | Training loss 11.401729 | Training R2 0.640858 | Validation loss 13.213898 | Validation R2 0.573487
Best loss 13.213898 | Best epoch 0017

100%##### 672/672 [01:32<00:00, 7.301t/s]
tensor([2.9063, 32.5171, 27.0092, 23.1816, 13.6546, 9.5199, 5.4563, 2.9917,
0.0526, 27.1170, 15.6950, 7.0300, 3.1720, 24.6290, 14.0523, 8.5620,
4.3510, 22.1035, 15.0576, 8.9973, 5.4540, 22.2026, 13.7354, 9.1169,
6.3164, 22.1400, 14.2489, 9.6895, 7.1809, 21.7399, 14.4235, 10.2083,
8.0124, 21.3545, 11.1481, 8.8666, 20.7642, 15.1376, 11.0578, 9.4312,
20.2414, 15.3610, 12.0332, 10.2129, 21.1648, 16.4321, 13.0070, 10.8106,
21.6568, 17.0286, 13.6300, 11.4462, 22.2054, 17.6234, 14.2651, 12.1728,
10.4076, 15.0337], grad_fn=IndexBackward0])
tensor([2.7419, 28.6490, 21.3500, 16.8100, 8.0564, 4.9078, 2.5526, 1.5643,
0.9587, 44.6470, 8.7898, 2.7858, 1.0463, 43.9200, 8.6592, 2.7445,
1.0300, 44.7000, 8.0094, 2.7920, 1.0407, 45.3100, 7.5611, 2.8303,
1.0630, 45.7270, 1.0111, 2.8560, 1.0727, 45.7350, 9.0137, 2.8560,
1.0730, 46.3300, 2.8935, 1.0868, 44.3590, 8.7473, 2.7724, 1.0413,
31.3930, 7.5594, 2.4035, 1.0628, 43.9420, 8.6636, 2.7459, 1.0313,
43.7170, 8.6165, 2.7309, 1.0257, 43.3150, 8.5370, 2.7060, 1.0163,
8.6510, 2.7419])

Epoch 0018 | Training loss 10.813417 | Training R2 0.683441 | Validation loss 13.203379 | Validation R2 0.574166
Best loss 13.203379 | Best epoch 0018

100%##### 672/672 [01:32<00:00, 7.231t/s]
tensor([9.7490, 40.5504, 13.2081, 8.8096, 25.9409, 14.4120, 2.2655, 1.0768,
24.7947, 16.0756, 1.6502], grad_fn=IndexBackward0])
tensor([7.3608, 43.7320, 14.9210, 2.7685, 45.9550, 10.0700, 3.8155, 2.9446,
46.1300, 18.1450, 2.9560])

Epoch 0019 | Training loss 10.473630 | Training R2 0.703023 | Validation loss 13.268398 | Validation R2 0.566962
Best loss 13.203379 | Best epoch 0018

100%##### 672/672 [01:34<00:00, 7.071t/s]
tensor([2.5559, 19.4985, 2.0311, 33.7659, 17.7553, 2.5439],
grad_fn=IndexBackward0])
tensor([0.9807, 13.2440, 1.0405, 44.2920, 11.1530, 1.0742])

Epoch 0020 | Training loss 9.496670 | Training R2 0.755842 | Validation loss 10.343183 | Validation R2 0.738677
Best loss 10.343183 | Best epoch 0020

100%##### 672/672 [01:30<00:00, 6.801t/s]
tensor([6.5600, 27.2245, 21.7960, 17.0100, 14.6090, 9.4095, 26.0533, 19.0093,
14.0560, 29.3752, 22.2000, 16.0390, 30.4300, 16.7102, 30.6311, 14.9095,
30.6151, 17.0785, 30.7607, 17.0520, 30.7647, 16.0004, 30.8296, 16.6525,
30.7940, 16.4834, 27.5907, 16.3012, 30.4290, 16.1035, 30.0555, 15.9718,
29.7075, 15.9149, 29.5319, 15.9032, 15.0856, 26.1470, 15.0809, 28.9241,
15.0869, 28.7300, 15.0830, 28.5423, 15.0782, 28.2471, 15.7892, 28.3078,
15.0780, 28.1359, 23.1418], grad_fn=IndexBackward0])
tensor([[13.4790, 19.0570, 10.7400, 8.5627, 4.6409, 22.6090, 10.6930,
5.8443, 23.2430, 11.0050, 6.0691, 23.4230, 6.1265, 23.3150, 6.1035,
23.4510, 6.1355, 23.4760, 6.1434, 23.1700, 6.0705, 23.2750, 6.0099,
23.2050, 6.0940, 17.6110, 6.0951, 23.2930, 6.0960, 23.1390, 6.0502,
23.1120, 6.0401, 23.1050, 6.0467, 6.0455, 17.4690, 6.0450, 23.1040,
6.0462, 23.0900, 6.0454, 23.0970, 6.0451, 22.0050, 5.9719, 23.0390,
6.0265, 22.6590, 13.4790])

Epoch 0021 | Training loss 7.951676 | Training R2 0.828823 | Validation loss 8.662602 | Validation R2 0.816695
Best loss 8.662602 | Best epoch 0021

100%##### 672/672 [01:46<00:00, 6.311t/s]
tensor([5.0714, 41.2239, 10.6933, 1.8153, -1.6640, 32.1170, 11.6598, 2.8483],
grad_fn=IndexBackward0])
tensor([2.7700, 40.9040, 9.4533, 2.2722, 0.6695, 40.0030, 9.4476, 2.2700])

Epoch 0022 | Training loss 7.609004 | Training R2 0.843258 | Validation loss 8.749406 | Validation R2 0.813000
Best loss 8.662602 | Best epoch 0021

100%##### 672/672 [02:05<00:00, 5.361t/s]
tensor([7.4991, 41.7259, 10.5250, 2.0759, -0.0212, -0.1132],
grad_fn=IndexBackward0])
tensor([7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724])

Epoch 0023 | Training loss 6.876002 | Training R2 0.872003 | Validation loss 6.000918 | Validation R2 0.806753
Best loss 6.000918 | Best epoch 0023

100%##### 672/672 [02:24<00:00, 4.661t/s]
tensor([[10.0532, 11.7258, 3.9000, 25.9815, 11.5955, 4.2005, 24.3615, 10.3238,
4.2500], grad_fn=IndexBackward0])
tensor([[16.2540, 16.8150, 3.7307, 46.7120, 18.2510, 4.0494, 39.1610, 16.6890,
4.1570]])

Epoch 0024 | Training loss 6.344456 | Training R2 0.891027 | Validation loss 6.287634 | Validation R2 0.903429
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:28<00:00, 4.531t/s]
tensor([1.6094, 23.4610, 3.5930, -1.5090, -2.5777, 30.9203, 8.1172, 1.3945,
-1.0457], grad_fn=IndexBackward0])
tensor([0.1465, 23.7240, 3.6020, 0.5996, 0.1266, 35.6020, 5.5209, 1.1669,
0.1900])

Epoch 0025 | Training loss 7.193916 | Training R2 0.859093 | Validation loss 8.765650 | Validation R2 0.812311
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:31<00:00, 4.451t/s]
tensor([8.8472, 41.0249, 8.3407, 2.1099, 36.6626, 12.1595],
grad_fn=IndexBackward0])
tensor([9.5449, 37.6970, 6.5141, 0.8206, 37.8140, 9.5449])

Epoch 0026 | Training loss 6.314091 | Training R2 0.892068 | Validation loss 7.142266 | Validation R2 0.875393
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:34<00:00, 4.341t/s]
tensor([8.5633, 52.2490, 1.5635, 17.5107, 1.9039, 16.5124, 1.4483],
grad_fn=IndexBackward0])
tensor([5.0400, 57.3470, 1.4345, 10.1510, 1.4741, 17.6500, 1.4340])

Epoch 0027 | Training loss 6.065744 | Training R2 0.900719 | Validation loss 5.718658 | Validation R2 0.920116
Best loss 5.718658 | Best epoch 0027

100%##### 672/672 [02:36<00:00, 4.291t/s]
tensor([7.0700, 42.2500, 11.1324, 3.1023, 1.2074, 2.6017, 21.2056, 6.6037,
3.4190], grad_fn=IndexBackward0])
tensor([7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
1.7160])

Epoch 0028 | Training loss 6.592818 | Training R2 0.882328 | Validation loss 7.770147 | Validation R2 0.852522

```
Best loss 5.718658 | Best epoch 0027

100%##### 672/672 [02:36<00:00, 4.38it/s]
tensor([ 3.7971, 35.3375, 8.4819, 1.6825, -0.3244, -0.4051, 13.2231, 2.0788,
        0.1861, 0.0965, 12.3860, 2.4895, 0.1087, 0.0419],
       grad_fn=<IndexBackward0>)
tensor([ 0.4268, 38.8918, 7.1683, 1.7787, 0.4414, 0.3499, 11.5880, 1.7944,
        0.4453, 0.3530, 18.8300, 2.1303, 0.4190, 0.3322])

Epoch 0029 | Training loss 5.998582 | Training R2 0.902587 | Validation loss 5.684497 | Validation R2 0.923274
Best loss 5.684497 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 2 --model 4 --save fold_2 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([2.1999, 5.6524, 5.4624, 0.1936, 9.4860, 9.8432],
       grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521])

Epoch 0001 | Training loss 24.587435 | Training R2 -0.636649 | Validation loss 29.936550 | Validation R2 -1.189140
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([ 4.9843, 8.9507, 9.0836, 9.2166, 9.3308, 13.3845, 13.5179, 13.6512,
        13.7654, 17.8186, 17.9522, 18.0858], grad_fn=<IndexBackward0>)
tensor([ 4.7756, 60.3880, 4.5623, 1.8531, 62.9590, 16.7740, 4.7714,
        1.6243, 63.0070, 16.7898, 4.7756])

Epoch 0002 | Training loss 25.483650 | Training R2 -0.758136 | Validation loss 33.067993 | Validation R2 -1.671072
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([ 7.4814, 11.8013, 11.8285], grad_fn=<IndexBackward0>)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0003 | Training loss 24.522140 | Training R2 -0.627971 | Validation loss 32.016544 | Validation R2 -1.583911
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([ 7.3291, 19.1688, 18.8233, 9.8829], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0004 | Training loss 22.401255 | Training R2 -0.358544 | Validation loss 28.629280 | Validation R2 -1.002123
Best loss 28.629280 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([14.4474, 19.8099, 19.4276, 18.6136, 23.0021, 21.7736, 26.9981, 26.1418,
        24.3684, 28.5206, 26.5152], grad_fn=<IndexBackward0>)
tensor([20.1880, 76.4000, 23.3870, 3.2069, 20.8640, 3.3441, 78.0870, 24.2140,
        3.3317, 23.8040, 3.2836])

Epoch 0005 | Training loss 19.169922 | Training R2 0.005122 | Validation loss 21.290998 | Validation R2 -0.107291
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([12.2389, 18.9281, 18.0086, 16.3241, 20.7797, 18.8313, 22.8460, 20.6343,
        24.4485, 21.9717], grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0059,
        15.0810, 2.0389])

Epoch 0006 | Training loss 19.678331 | Training R2 -0.048349 | Validation loss 22.492300 | Validation R2 -0.235770
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 9.8321, 16.7148, 15.5704, 14.4203], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0007 | Training loss 18.438383 | Training R2 0.079604 | Validation loss 20.871935 | Validation R2 -0.064132
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 0.2794, 0.7751, 0.5484, -0.3596, -1.0415, -1.9520, -2.6358, -3.3204,
        -2.3768, -4.0057, -5.6395], grad_fn=<IndexBackward0>)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0657, 7.0164,
        1.2240, 0.2320])

Epoch 0008 | Training loss 20.370321 | Training R2 -0.123375 | Validation loss 23.957869 | Validation R2 -0.402059
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([17.7417, 27.3907, 26.9301], grad_fn=<IndexBackward0>)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0009 | Training loss 19.084763 | Training R2 0.013942 | Validation loss 21.900908 | Validation R2 -0.171647
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:30<00:00, 7.46it/s]
tensor([17.3056, 25.6101, 24.2517, 20.7280, 26.5591, 24.9605, 21.8946, 26.8496,
        25.2540, 22.2393], grad_fn=<IndexBackward0>)
tensor([17.8830, 55.3190, 16.9870, 2.1271, 56.8470, 17.5230, 2.1942, 57.7130,
        17.7900, 2.2277])

Epoch 0010 | Training loss 17.859404 | Training R2 0.136499 | Validation loss 20.114540 | Validation R2 0.011697
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 8.7530, 19.8132, 16.0518, 16.2882, 22.7456, 19.5403, 19.2723],
       grad_fn=<IndexBackward0>)
tensor([ 9.2600, 25.5950, 5.0055, 3.7205, 26.2690, 4.4291, 3.8185])

Epoch 0011 | Training loss 18.237335 | Training R2 0.099566 | Validation loss 20.373814 | Validation R2 -0.013945
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 9.9975, 15.6876, 13.4450, 11.2983, 17.1275, 15.1765, 11.2384],
       grad_fn=<IndexBackward0>)
tensor([14.9510, 17.0860, 6.4340, 2.7857, 51.9570, 17.6200, 2.8727])

Epoch 0012 | Training loss 17.548340 | Training R2 0.166316 | Validation loss 19.443098 | Validation R2 0.076577
Best loss 19.443098 | Best epoch 0012

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 9.9177, 18.4395, 17.9721, 17.5216, 14.3823, 12.5939, 11.2551, 9.9186,
        16.4753, 13.0404], grad_fn=<IndexBackward0>)
tensor([ 4.1835, 35.5470, 29.2780, 24.3620, 6.9818, 3.3599, 1.9581, 1.1412,
        14.7460, 4.1835])

Epoch 0013 | Training loss 17.206947 | Training R2 0.198439 | Validation loss 19.141432 | Validation R2 0.105009
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([12.4364, 27.2565, 23.2694, 19.6116, 16.4919, 29.9886, 27.1892, 23.8359,
        20.2024], grad_fn=<IndexBackward0>)
tensor([ 4.7756, 60.3880, 16.0390, 4.5623, 1.8531, 62.9590, 16.7740, 4.7714,
        1.6243])

Epoch 0014 | Training loss 17.306837 | Training R2 0.189105 | Validation loss 19.362793 | Validation R2 0.084189
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([ 9.8598, 20.0499, 19.4907, 18.9328, 17.8166, 16.1479, 12.2752, 10.0752,
        8.9780, 18.8707, 14.2077, 10.3545, 8.6502, 18.4221, 14.3102, 10.7020,
        9.1701], grad_fn=<IndexBackward0>)
tensor([ 1.7205, 44.0430, 33.8580, 27.3178, 18.5670, 10.6030, 2.0810, 1.3684,
        0.9431, 27.6900, 6.1533, 1.6721, 0.9507, 23.0690, 6.2359, 1.6946,
        0.9695])

Epoch 0015 | Training loss 16.755896 | Training R2 0.239911 | Validation loss 19.031542 | Validation R2 0.115256
Best loss 19.031542 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([ 0.9582, 1.0900, 0.4565, -1.8299, -3.4424, -5.5529, 7.1404,
        -8.7248, -7.3052, -10.9318, -14.4289], grad_fn=<IndexBackward0>)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0657, 7.0164,
        1.2240, 0.2320])

Epoch 0016 | Training loss 16.645119 | Training R2 0.249928 | Validation loss 18.393700 | Validation R2 0.173566
Best loss 18.393700 | Best epoch 0016

100%##### 672/672 [01:34<00:00, 7.14it/s]
tensor([ 6.8242, 20.9803, 15.5757, 10.6441, 6.5071, 20.2602, 15.3891, 10.3295,
        6.4992, 19.2614, 16.2200, 12.1360, 8.1073], grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 61.0410, 12.7110, 4.2813,
        1.6846, 42.8210, 13.2640, 4.4680, 1.7581])

Epoch 0017 | Training loss 16.093096 | Training R2 0.298854 | Validation loss 17.970434 | Validation R2 0.211163
Best loss 17.970434 | Best epoch 0017

100%##### 672/672 [01:38<00:00, 6.82it/s]
tensor([12.8932, 35.1585, 29.2565, 17.6236, 35.2379, 31.1231, 21.2395],
       grad_fn=<IndexBackward0>)
```

```
tensor([ 3.8765, 62.3080, 16.2100, 1.3937, 63.5960, 16.5530, 1.4231])

Epoch 0018 | Training loss 15.311383 | Training R2 0.365315 | Validation loss 16.984724 | Validation R2 0.295328
Best loss 16.984724 | Best epoch 0018

100%##### 672/672 [01:49<00:00, 6.14it/s]
tensor([16.5482, 29.7479, 28.8376], grad_fn=<IndexBackward0>)
tensor([21.0180, 30.1650, 21.5660])

Epoch 0019 | Training loss 14.230435 | Training R2 0.451751 | Validation loss 15.854136 | Validation R2 0.386819
Best loss 15.854136 | Best epoch 0019

100%##### 672/672 [02:02<00:00, 5.47it/s]
tensor([19.7466, 42.1145, 38.2686, 14.1118, 37.6803, 25.5962, 11.4744, 34.7414,
11.2551, 33.2510, 23.2312, 11.2077, 33.8895, 23.2144, 11.2046, 32.8959,
23.1463, 11.2140, 32.9500, 23.3397, 11.3844, 32.9221, 23.4265, 11.5183,
23.5826, 11.6663, 32.9219, 23.6521, 11.7840, 32.9144, 23.7639], grad_fn=<IndexBackward0>)
tensor([19.8480, 53.1050, 18.5150, 3.2922, 56.7650, 19.9680, 3.5506, 57.2050,
3.5796, 56.8250, 19.9978, 3.5558, 56.6830, 19.9170, 3.5416, 56.1670,
19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.8470, 3.5292,
19.8520, 3.5300, 56.3440, 19.8300, 3.5261, 56.4400, 19.8400])

Epoch 0020 | Training loss 12.025495 | Training R2 0.608497 | Validation loss 13.721763 | Validation R2 0.540872
Best loss 13.721763 | Best epoch 0020

100%##### 672/672 [02:25<00:00, 4.62it/s]
tensor([11.1434, 49.1650, 25.8507, 12.7483], grad_fn=<IndexBackward0>)
tensor([ 0.4385, 64.0190, 18.8300, 2.4664])

Epoch 0021 | Training loss 12.230107 | Training R2 0.595061 | Validation loss 13.446256 | Validation R2 0.558356
Best loss 13.446256 | Best epoch 0021

100%##### 672/672 [02:41<00:00, 4.16it/s]
tensor([ 7.8498, 35.5636, 31.8140, 27.4297, 23.8189, 15.3497, 39.8910, 28.7233,
18.5893, 41.4949, 38.8928, 19.8995, 41.8754, 38.6326, 20.1299, 38.6822,
20.5340, 38.5935, 21.5521], grad_fn=<IndexBackward0>)
tensor([12.5700, 31.8440, 25.2530, 28.7050, 17.3880, 18.5840, 40.6760, 22.8730,
13.7690, 43.5540, 24.6480, 15.0630, 44.0460, 35.6960, 15.2700, 35.8460,
15.3380, 35.8950, 15.3590])

Epoch 0022 | Training loss 9.790716 | Training R2 0.740488 | Validation loss 12.751149 | Validation R2 0.602837
Best loss 12.751149 | Best epoch 0022

100%##### 672/672 [02:38<00:00, 4.23it/s]
tensor([14.1666, 61.5551, 29.6613, 8.8076, 58.5753, 24.2845, 8.8832], grad_fn=<IndexBackward0>)
tensor([ 6.2430, 65.8400, 25.1060, 4.2933, 69.2210, 23.5690, 4.5781])

Epoch 0023 | Training loss 8.497423 | Training R2 0.804519 | Validation loss 10.855521 | Validation R2 0.712147
Best loss 10.855521 | Best epoch 0023

100%##### 672/672 [02:47<00:00, 4.02it/s]
tensor([15.8495, 61.9667, 28.1483, 10.4488], grad_fn=<IndexBackward0>)
tensor([18.4370, 63.6710, 21.1850, 2.2938])

Epoch 0024 | Training loss 7.026572 | Training R2 0.866335 | Validation loss 7.219308 | Validation R2 0.872690
Best loss 7.219308 | Best epoch 0024

100%##### 672/672 [03:04<00:00, 3.64it/s]
tensor([15.8177, 53.2453, 22.2400, 13.1297, 52.0899, 24.2600], grad_fn=<IndexBackward0>)
tensor([20.1680, 53.7810, 19.0600, 3.5221, 56.3060, 20.1680])

Epoch 0025 | Training loss 22.096283 | Training R2 -0.321805 | Validation loss 31.622337 | Validation R2 -1.442631
Best loss 7.219308 | Best epoch 0024

100%##### 672/672 [03:00<00:00, 3.72it/s]
tensor([ 9.0573, 64.0458, 19.9370, 7.2607, 4.3328, 59.8810, 18.9035, 3.8537], grad_fn=<IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666])

Epoch 0026 | Training loss 6.403774 | Training R2 0.880900 | Validation loss 6.044273 | Validation R2 0.910760
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [02:59<00:00, 3.75it/s]
tensor([ 6.9223, 61.5160, 18.7082, 3.0362, 18.1905, 2.9401, 18.2441, 2.8033], grad_fn=<IndexBackward0>)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0559])

Epoch 0027 | Training loss 6.205529 | Training R2 0.895747 | Validation loss 6.115032 | Validation R2 0.908659
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [02:58<00:00, 3.76it/s]
tensor([ 6.4950, 60.9784, 50.3774, 41.8519, 28.7659, 16.2084, 8.8078, 3.7320, 2.6390], grad_fn=<IndexBackward0>)
tensor([10.7920, 67.0230, 58.2480, 40.4590, 28.8060, 18.4230, 11.9080, 6.6646, 4.3127])

Epoch 0028 | Training loss 6.358976 | Training R2 0.890528 | Validation loss 5.888662 | Validation R2 0.915296
Best loss 5.888662 | Best epoch 0028

100%##### 672/672 [02:56<00:00, 3.80it/s]
tensor([ 5.4355, 52.7556, 12.8180, 2.5391], grad_fn=<IndexBackward0>)
tensor([ 1.6420, 52.0970, 9.0003, 1.9523])

Epoch 0029 | Training loss 6.320073 | Training R2 0.891863 | Validation loss 5.790334 | Validation R2 0.918101
Best loss 5.790334 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 2 --model 5 --save fold_2 --lr 0.00005 --tol 1e-4 --epochs 30 --12 0.1
100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([ 2.8724, 6.5957, 6.8080, 6.9899, 7.2021, 10.7213, 10.9348, 11.3314,
14.0272, 15.0422, 15.1036, 15.4413, 19.9374, 19.1537, 19.5554, 23.0516,
23.2493, 23.6736, 27.3576, 27.6082, 27.7960, 30.7720, 30.9930, 31.2133], grad_fn=<IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666,
61.4200, 21.6510, 16.6500, 3.9430, 61.4000, 21.6430, 3.9424, 61.4240,
21.6460, 3.9429, 24.6850, 6.6517, 3.9430, 52.7130, 18.6040, 7.4356])

Epoch 0001 | Training loss 25.439190 | Training R2 -0.752000 | Validation loss 31.925747 | Validation R2 -1.489729
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.58it/s]
tensor([ 3.2931, 5.3593, 5.3786, 5.3908, 5.4173, 5.4752, 7.2008, 7.3569,
7.4149, 9.1766, 9.2347, 9.2928, 11.0515, 11.1676, 12.9117, 13.0278,
14.7841, 14.9023, 16.6000, 16.7768, 18.5066, 18.6228, 20.3668, 20.4030,
22.2271, 22.3433, 24.1007, 24.2035, 25.9476, 26.0630, 27.7936, 27.9099,
29.6397, 29.7559, 31.4857, 31.6020, 33.4481, 35.1973, 35.2942, 37.0240,
37.1403, 38.8701, 38.9064, 40.7162, 40.8325, 42.5338, 42.6501, 44.3000,
44.4963, 46.1862, 46.2250], grad_fn=<IndexBackward0>)
tensor([13.4790, 18.0570, 13.8900, 10.7400, 8.5627, 4.6400, 22.6090, 10.6930,
5.8463, 23.2430, 11.0050, 6.0691, 23.4230, 6.1265, 23.3150, 6.1035,
23.4510, 6.1355, 23.4760, 6.1434, 23.1780, 6.0705, 23.2750, 6.0809,
23.2850, 6.0940, 17.6110, 6.0951, 23.2930, 6.0960, 23.1390, 6.0052,
23.1120, 6.0491, 23.1050, 6.0467, 6.0455, 17.4690, 6.0458, 23.1040,
6.0462, 23.0900, 6.0454, 23.0970, 6.0451, 22.8050, 5.9719, 23.0390,
6.0265, 22.6590, 13.4790])

Epoch 0002 | Training loss 26.376934 | Training R2 -0.883553 | Validation loss 34.834122 | Validation R2 -1.964010
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.58it/s]
tensor([ 7.8250, 11.0704, 11.0799, 11.0814, 11.0879, 11.0917, 11.0975, 11.9019,
11.9062, 12.7652, 15.7765, 15.7875], grad_fn=<IndexBackward0>)
tensor([ 2.8854, 42.8900, 34.5060, 27.9040, 12.2340, 6.5823, 2.8806, 1.5499,
0.8339, 54.9410, 12.2540, 2.8854])

Epoch 0003 | Training loss 24.805820 | Training R2 -0.665852 | Validation loss 32.632885 | Validation R2 -1.601243
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([ 8.7306, 11.7069, 11.5418, 11.3754, 11.2797, 11.2316, 13.9237, 13.7604,
13.6669, 13.6202, 16.3320, 16.2147, 16.1207, 16.0730], grad_fn=<IndexBackward0>)
tensor([ 5.1025, 48.9670, 16.0790, 6.3620, 6.3007, 2.7427, 18.1490, 6.0004,
3.8809, 2.9318, 14.1770, 7.0320, 4.0131, 3.0316])

Epoch 0004 | Training loss 22.594074 | Training R2 -0.302833 | Validation loss 29.154833 | Validation R2 -1.076304
Best loss 29.154833 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.53it/s]
tensor([13.8576, 17.9291, 17.4015, 16.8603], grad_fn=<IndexBackward0>)
tensor([40.1440, 50.7900, 7.5206, 1.1606])

Epoch 0005 | Training loss 19.321512 | Training R2 -0.010675 | Validation loss 21.662233 | Validation R2 -0.146242
Best loss 21.662233 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([11.5918, 16.2094, 16.0552], grad_fn=<IndexBackward0>)
tensor([21.0180, 30.1650, 21.5660])
```

```
Epoch 0006 | Training loss 18.806362 | Training R2 0.042500 | Validation loss 20.810762 | Validation R2 -0.057903
Best loss 20.810762 | Best epoch 0006

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([13.7967, 24.9147, 23.5848, 22.4126, 21.0541, 27.8658, 26.2462, 23.2119],
       grad_fn=IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666])

Epoch 0007 | Training loss 18.502975 | Training R2 0.073144 | Validation loss 20.257120 | Validation R2 -0.002364
Best loss 20.257120 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([ 7.3947, 16.2876, 14.5021], grad_fn=IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0008 | Training loss 17.884424 | Training R2 0.134077 | Validation loss 19.712755 | Validation R2 0.050785
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([ 7.4839, 16.9333, 14.2522], grad_fn=IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0009 | Training loss 18.018396 | Training R2 0.121056 | Validation loss 20.877218 | Validation R2 -0.064670
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([0.6249, 7.8101, 7.3241, 3.8194, 1.0698], grad_fn=IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0010 | Training loss 17.464170 | Training R2 0.174295 | Validation loss 20.522924 | Validation R2 -0.028841
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([ 9.3226, 15.8665, 8.5315, 13.2728, 7.9733], grad_fn=IndexBackward0>)
tensor([15.8300, 13.0430, 1.2608, 15.9120, 1.2850])

Epoch 0011 | Training loss 15.910845 | Training R2 0.316445 | Validation loss 18.198824 | Validation R2 0.190985
Best loss 18.198824 | Best epoch 0011

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([ 4.3449, 16.5067], grad_fn=IndexBackward0>)
tensor([ 2.4489, 16.6950])

Epoch 0012 | Training loss 15.860810 | Training R2 0.318949 | Validation loss 18.750023 | Validation R2 0.141237
Best loss 18.198824 | Best epoch 0011

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([ 8.7084, 25.3828, 17.3558, 9.8191, 3.7226, 1.3463, 10.4619, 6.1137,
        2.9816, 10.1290, 7.5545, 4.8109, 4.4530], grad_fn=IndexBackward0>)
tensor([ 7.2029, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
        1.7166, 17.7690, 5.9424, 1.9898, 1.7019])

Epoch 0013 | Training loss 13.904661 | Training R2 0.476508 | Validation loss 15.886896 | Validation R2 0.383479
Best loss 15.886896 | Best epoch 0013

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([ 7.0435, 27.5000, 16.8307, 7.2200, 0.1804, 9.7051, 3.3722, -0.6607,
        7.9056, 3.2674, -0.1207], grad_fn=IndexBackward0>)
tensor([ 1.7436, 45.8730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866,
        16.0500, 5.2932, 1.7451])

Epoch 0014 | Training loss 12.929752 | Training R2 0.547405 | Validation loss 15.179044 | Validation R2 0.437194
Best loss 15.179044 | Best epoch 0014

100%##### 672/672 [01:33<00:00, 7.17it/s]
tensor([ 7.4332, 30.5729, 16.2396], grad_fn=IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0015 | Training loss 12.248608 | Training R2 0.593835 | Validation loss 14.446182 | Validation R2 0.490228
Best loss 14.446182 | Best epoch 0015

100%##### 672/672 [01:34<00:00, 7.13it/s]
tensor([ 4.6836, 7.6900, 7.1004, 17.4322, 10.2643, 9.2034, 19.8746, 11.5507,
        10.7440, 13.1053, 12.3932, 20.9605, 14.0527, 22.7131, 10.8298],
       grad_fn=IndexBackward0>)
tensor([ 8.4665, 2.6608, 2.2691, 10.5760, 3.2225, 2.3435, 25.5770, 3.2261,
        2.3462, 3.2262, 2.3463, 25.6730, 2.3549, 30.2890, 8.4665])

Epoch 0016 | Training loss 11.735577 | Training R2 0.627147 | Validation loss 14.173969 | Validation R2 0.509258
Best loss 14.173969 | Best epoch 0016

100%##### 672/672 [01:36<00:00, 6.99it/s]
tensor([11.6500, 60.2137, 25.1021, 10.0511], grad_fn=IndexBackward0>)
tensor([ 5.7740, 05.1420, 19.1070, 6.7725])

Epoch 0017 | Training loss 10.962422 | Training R2 0.674656 | Validation loss 14.000322 | Validation R2 0.521209
Best loss 14.000322 | Best epoch 0017

100%##### 672/672 [01:41<00:00, 6.60it/s]
tensor([ 1.9511, 20.6897, 3.2096, -2.9083, -5.5950, 20.0863, 5.9632, -0.5994,
        -4.8749, 19.8183, 4.0704, -1.1292, 4.3055, 19.2795, 7.1046, 0.7701,
        -3.7093], grad_fn=IndexBackward0>)
tensor([ 0.1465, 23.7240, 3.6020, 0.5996, 0.1266, 35.6020, 5.5209, 1.1669,
        0.1900, 35.4000, 5.5170, 0.0905, 0.1096, 35.4000, 7.1499, 1.5090,
        0.1096])

Epoch 0018 | Training loss 8.945731 | Training R2 0.783349 | Validation loss 10.094747 | Validation R2 0.751079
Best loss 10.094747 | Best epoch 0018

100%##### 672/672 [02:00<00:00, 5.56it/s]
tensor([10.3029, 63.2539, 23.4279, 4.5201, 46.1509, 19.9410, 4.2955, 35.4959,
        16.3430, 3.1342, 26.7132, 12.0767, 3.3039, 2.6298],
       grad_fn=IndexBackward0>)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4090, 19.8330, 2.0444, 57.7000,
        16.2300, 1.6730, 44.0250, 12.3930, 1.0120, 1.2775])

Epoch 0019 | Training loss 8.820597 | Training R2 0.789368 | Validation loss 9.154214 | Validation R2 0.795303
Best loss 9.154214 | Best epoch 0019

100%##### 672/672 [02:17<00:00, 4.88it/s]
tensor([ 4.1644, 14.0120, -0.3130, 27.2210, 10.2752, -0.3314, 23.0703, 7.9699,
        -0.3345], grad_fn=IndexBackward0>)
tensor([ 1.7265, 18.3160, 2.4943, 49.3070, 15.7100, 2.1405, 40.9940, 12.9500,
        1.7635])

Epoch 0020 | Training loss 7.317793 | Training R2 0.855026 | Validation loss 7.885971 | Validation R2 0.840092
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:28<00:00, 4.54it/s]
tensor([ 8.4705, 47.7004, 13.9731, 1.0109, 41.2109, 11.3355, 1.4946, 40.8071,
        13.6375, 2.4164, 39.6342, 12.4571, 3.1625], grad_fn=IndexBackward0>)
tensor([ 2.9403, 47.9160, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370,
        18.1500, 2.9979, 52.4090, 15.7600, 2.9900])

Epoch 0021 | Training loss 7.042254 | Training R2 0.865738 | Validation loss 8.384834 | Validation R2 0.828265
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:32<00:00, 4.40it/s]
tensor([ 4.4215, 36.0000, 0.1078, 0.6668, -1.3523, -1.4270, 11.2206, -0.1053,
        -1.0605, -1.9566, 9.4959, -0.7273, -2.5235, -2.5964, 0.4442, -2.1228,
        -3.3086, -3.3706], grad_fn=IndexBackward0>)
tensor([ 0.4160, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5000, 1.7944,
        0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7020, 1.6012,
        0.4172, 0.3307])

Epoch 0022 | Training loss 9.585545 | Training R2 0.751250 | Validation loss 10.479062 | Validation R2 0.731724
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:33<00:00, 4.37it/s]
tensor([ 7.7273, 48.1425, 12.7922, 1.4126, 44.4121, 10.8110, 1.0509, 44.7639,
        13.0078, 1.6967, 44.0305, 10.4309, 1.3453], grad_fn=IndexBackward0>)
tensor([ 2.9403, 47.9160, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370,
        18.1500, 2.9979, 52.4090, 15.7600, 2.9900])

Epoch 0023 | Training loss 6.300526 | Training R2 0.892531 | Validation loss 5.878633 | Validation R2 0.915584
Best loss 5.878633 | Best epoch 0023

100%##### 672/672 [02:35<00:00, 4.32it/s]
tensor([ 4.2453, 36.7011, 8.6615, 1.4089, -0.0500, -0.0957, 12.9539, 1.7627,
        0.3970, 0.3455, 12.1383, 1.0436, 0.3857, 0.3445, 11.9547, 1.1000,
        0.2205, 0.1006, 11.7720, 1.7016, 0.1001, 7.4640, 1.6911, 0.0025,
        11.4607, 0.7494, -0.1201, -0.1700, 0.2474, -0.3031, 30.3001, 6.5045,
        0.4006, -0.2033], grad_fn=IndexBackward0>)
tensor([ 0.4160, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5000, 1.7944,
        0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7020, 1.6012,
        0.4172, 0.3307, 10.7100, 1.6811, 0.4171, 0.3307, 1.0556, 0.3304, 35.0900, 6.7693,
        1.3316, 0.4168])

Epoch 0024 | Training loss 6.111111 | Training R2 0.898096 | Validation loss 5.600600 | Validation R2 0.921174
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:42<00:00, 4.15it/s]
tensor([ 8.0150, 11.5567, 4.6076, 11.2702, 5.0257, 6.5830, 5.3709, 11.5210,
        5.0812, 11.6247, 5.0075, 11.7576, 6.1699, 12.0414, 6.4307, 12.2436],
       grad_fn=IndexBackward0>)
tensor([14.5400, 14.3260, 2.1336, 15.1400, 2.2555, 7.1526, 2.2150, 14.6630,
        2.1830, 14.4490, 2.1519, 14.3450, 2.1365, 14.4340, 2.1497, 14.5460])

Epoch 0025 | Training loss 6.472453 | Training R2 0.806506 | Validation loss 7.626001 | Validation R2 0.857940
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:58<00:00, 3.77it/s]
tensor([ 1.5432, 6.2264, 4.7043, 3.4637, 1.7140, 0.1073, -0.2402, -0.3312,
        -0.3259], grad_fn=IndexBackward0>)
tensor([0.0492, 5.0725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4770, 0.1072, 0.0927])

Epoch 0026 | Training loss 6.022579 | Training R2 0.873904 | Validation loss 8.459092 | Validation R2 0.825177
```



```
Best loss 5.680600 | Best epoch 0024

100%##### 672/672 [02:53<00:00, 3.88it/s]
tensor([12.3268, 41.0046, 31.4636], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1650, 21.5640])

Epoch 0027 | Training loss 6.095039 | Training R2 0.899400 | Validation loss 6.896765 | Validation R2 0.883812
Best loss 5.680600 | Best epoch 0024

100%##### 672/672 [02:48<00:00, 4.00it/s]
tensor([ 3.3598, 38.0550, 32.1865, 26.7041, 11.2778, 5.3198, 1.1977, -0.6329,
 44.5388, 10.9635, 1.2176], grad_fn=<IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2586,
 39.4790, 6.4477, 1.1231])

Epoch 0028 | Training loss 6.544991 | Training R2 0.884030 | Validation loss 6.196602 | Validation R2 0.906206
Best loss 5.680600 | Best epoch 0024

100%##### 672/672 [02:45<00:00, 4.07it/s]
tensor([ 5.3302, 57.8313, 14.6693, 3.2426, 1.1091, 15.5492, 4.0520, 2.3154,
 58.9204, 16.3087, 2.9400, 2.4515, 56.0250, 16.0240, 5.9094, 2.6612,
 20.1659, 6.1725, 3.0380, 20.9118, 6.8515, 3.4699],
 grad_fn=<IndexBackward0>)
tensor([ 0.8310, 59.4470, 12.7970, 2.9511, 0.8392, 12.6360, 2.9139, 0.8286,
 58.9270, 12.7180, 1.5640, 0.8341, 56.6760, 12.2320, 3.4784, 0.8022,
 15.3490, 3.5396, 0.8163, 15.6260, 3.6034, 0.8310])

Epoch 0029 | Training loss 6.115059 | Training R2 0.898765 | Validation loss 7.040408 | Validation R2 0.878922
Best loss 5.680600 | Best epoch 0024

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 3 --model 1 --save fold_3 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([ 2.1615, 4.8593, 5.0546, 5.4167, 7.8210, 8.3762, 10.8642, 11.1145,
 11.2536, 13.7084, 14.0987], grad_fn=<IndexBackward0>)
tensor([ 7.7458, 46.1910, 15.8090, 2.9155, 46.8330, 2.9904, 18.0300, 5.5715,
 2.9820, 17.7400, 2.8574])

Epoch 0001 | Training loss 25.062193 | Training R2 -0.700463 | Validation loss 31.127050 | Validation R2 -1.366714
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.42it/s]
tensor([4.8309, 7.9015, 0.8395, 0.1939], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0002 | Training loss 25.686121 | Training R2 -0.706184 | Validation loss 33.511566 | Validation R2 -1.743212
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([10.7076, 14.7270, 14.7284, 14.7284, 14.7209, 14.7290, 14.7307, 14.7310,
 14.7326], grad_fn=<IndexBackward0>)
tensor([10.7920, 67.0230, 58.2480, 40.4590, 28.0800, 18.4230, 11.9080, 6.6646,
 4.3127])

Epoch 0003 | Training loss 24.546101 | Training R2 -0.631151 | Validation loss 32.111191 | Validation R2 -1.518737
Best loss 31.127050 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([3.3200, 8.1569], grad_fn=<IndexBackward0>)
tensor([ 2.4489, 16.6950])

Epoch 0004 | Training loss 22.813705 | Training R2 -0.409032 | Validation loss 29.552938 | Validation R2 -1.133395
Best loss 29.552938 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.55it/s]
tensor([2.0743, 3.6092, 3.5648, 3.4382, 3.1781, 2.7698, 2.3375, 1.7664, 1.4013],
 grad_fn=<IndexBackward0>)
tensor([0.0492, 5.6725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4778, 0.0927])

Epoch 0005 | Training loss 18.439297 | Training R2 0.079513 | Validation loss 20.436909 | Validation R2 -0.020243
Best loss 20.436909 | Best epoch 0005

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([14.8104, 21.9930, 21.9930, 19.1529, 25.6132, 24.3171, 21.0630, 28.2239],
 grad_fn=<IndexBackward0>)
tensor([ 6.2430, 65.8400, 25.1060, 4.2933, 69.2210, 23.5690, 4.5701, 68.7910,
 23.4760, 4.5602, 68.2770, 23.3020, 4.5263])

Epoch 0006 | Training loss 17.760878 | Training R2 0.146000 | Validation loss 19.276941 | Validation R2 0.092292
Best loss 19.276941 | Best epoch 0006

100%##### 672/672 [01:31<00:00, 7.37it/s]
tensor([ 7.2685, 17.0126, 17.6222, 17.4313, 16.6626, 16.0806, 15.2971, 14.1049,
 19.7325, 18.0099, 14.3651], grad_fn=<IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2586,
 39.4790, 6.4477, 1.1231])

Epoch 0007 | Training loss 17.224669 | Training R2 0.196787 | Validation loss 18.606171 | Validation R2 0.154363
Best loss 18.606171 | Best epoch 0007

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([ 8.3480, 18.9609, 17.0796, 13.5076, 19.1425, 16.7568, 12.2467, 17.5037,
 15.0191, 9.3061, 14.1835, 11.0100], grad_fn=<IndexBackward0>)
tensor([ 4.9161, 42.0730, 5.4509, 60.7050, 39.7010, 5.1625, 0.1270, 38.5530,
 6.6617, 0.1233, 37.8370, 4.9161])

Epoch 0008 | Training loss 16.080960 | Training R2 0.235009 | Validation loss 18.307007 | Validation R2 0.174167
Best loss 18.307007 | Best epoch 0008

100%##### 672/672 [01:33<00:00, 7.19it/s]
tensor([ 5.5405, 19.0450, 15.2522, 12.2369, 12.8317, 10.4610, 14.6005, 11.4213,
 11.8837, 10.3732, 10.1442, 13.0661, 11.2020, 9.0947, 9.6595],
 grad_fn=<IndexBackward0>)
tensor([ 9.0003, 13.5140, 3.7950, 1.5319, 1.2770, 13.2000, 3.7295, 1.2557,
 3.7290, 1.5053, 1.2555, 13.1800, 3.7035, 1.4950, 1.2470])

Epoch 0009 | Training loss 16.176075 | Training R2 0.291605 | Validation loss 17.658400 | Validation R2 0.238313
Best loss 17.658400 | Best epoch 0009

100%##### 672/672 [01:34<00:00, 7.12it/s]
tensor([ 4.4795, 11.0215, 0.0239, 6.1557, 12.2520, 0.1995, 6.0050, 5.2000,
 5.0226], grad_fn=<IndexBackward0>)
tensor([ 3.7684, 12.6090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6054,
 1.9625])

Epoch 0010 | Training loss 15.784349 | Training R2 0.325499 | Validation loss 17.559269 | Validation R2 0.246048
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.42it/s]
tensor([12.7334, 35.1197, 29.4521, 23.7096, 18.7326, 32.3226, 24.1075],
 grad_fn=<IndexBackward0>)
tensor([15.0620, 56.9590, 15.1510, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0011 | Training loss 19.386719 | Training R2 -0.009120 | Validation loss 25.415319 | Validation R2 -0.577833
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:32<00:00, 7.27it/s]
tensor([32.0300, 42.7443, 41.1327, 39.0190, 37.9050, 47.3776, 44.0530,
 40.7275, 49.5277, 43.0061, 41.0659, 49.2414, 39.0080, 46.0657, 34.0696,
 42.4265, 29.7071, 36.3032, 27.1146, 31.6529, 26.3287, 30.2598, 25.4065],
 grad_fn=<IndexBackward0>)
tensor([50.0520, 41.9500, 32.4700, 27.1470, 20.1960, 15.4500, 55.2420, 32.3270,
 21.5820, 60.6230, 31.3470, 24.0360, 61.8120, 24.6620, 62.3610, 24.9130,
 62.5010, 25.0130, 62.4200, 24.9640, 62.3850, 24.9450, 62.3600, 24.9370])

Epoch 0012 | Training loss 15.314219 | Training R2 0.365000 | Validation loss 18.021051 | Validation R2 0.206713
Best loss 17.559269 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([ 0.5030, 2.0243, 1.2080, 0.5755, 0.0550, -1.1180, -1.4900, -1.7581,
 -1.9126, -2.0494, -1.1390, -1.4614, -1.5440, -1.7204, -1.9236],
 grad_fn=<IndexBackward0>)
tensor([0.1027, 4.3675, 3.3207, 2.6709, 2.2190, 1.1160, 0.6726, 0.3426, 0.2066,
 0.1245, 4.4427, 1.1442, 0.0164, 0.3513, 0.1277])

Epoch 0013 | Training loss 14.627570 | Training R2 0.420740 | Validation loss 16.076558 | Validation R2 0.304275
Best loss 16.076558 | Best epoch 0013

41%##### | 275/672 [00:37<01:27, 4.52it/s]100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([ 8.0011, 44.5529, 42.7156, 40.0827, 31.7829, 26.4018, 19.3116, 9.0496,
 38.4039, 23.2554, 15.9224, 11.0409, 20.7719, 15.0965, 11.2353, 10.4193,
 15.1102, 12.0790, 10.1327, 16.6530, 15.1004, 19.4565, 10.0770, 16.5790,
 10.9620], grad_fn=<IndexBackward0>)
tensor([ 4.2077, 59.4320, 46.9050, 30.1200, 14.2500, 7.9220, 3.6106, 1.1171,
 59.4090, 17.3990, 4.4157, 1.1207, 17.1950, 4.3640, 1.1075, 17.2010,
 4.3006, 1.1130, 16.0030, 5.2057, 1.0061, 16.0050, 4.2779, 1.0057,
 4.2077])

Epoch 0014 | Training loss 13.552494 | Training R2 0.502758 | Validation loss 15.915753 | Validation R2 0.301237
Best loss 15.915753 | Best epoch 0014
```

```
100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([ 4.4982, 21.3597, 5.1706], grad_fn=<IndexBackward0>)
tensor([ 4.6703, 20.6660, 3.8425])

Epoch 0015 | Training loss 13.312044 | Training R2 0.520246 | Validation loss 15.572647 | Validation R2 0.407628
Best loss 15.572647 | Best epoch 0015

100%##### 672/672 [01:34<00:00, 7.12it/s]
tensor([ 5.1430, 8.7150, 8.2335, 17.3050, 10.0080, 9.1330, 17.2026, 10.6096,
        10.4114], grad_fn=<IndexBackward0>)
tensor([ 8.4665, 2.6600, 2.2691, 18.5760, 3.2225, 2.3435, 25.5770, 3.2261,
        2.3621])

Epoch 0016 | Training loss 12.642657 | Training R2 0.567281 | Validation loss 14.518663 | Validation R2 0.485100
Best loss 14.518663 | Best epoch 0016

100%##### 672/672 [01:35<00:00, 7.05it/s]
tensor([ 8.6450, 39.9109, 19.5235, 1.5690, 25.5519, 13.4577, 2.6799],
        grad_fn=<IndexBackward0>)
tensor([ 2.9463, 47.9160, 16.4030, 2.7094, 51.2510, 15.3770, 2.9173])

Epoch 0017 | Training loss 12.009523 | Training R2 0.609536 | Validation loss 13.955899 | Validation R2 0.524243
Best loss 13.955899 | Best epoch 0017

100%##### 672/672 [01:35<00:00, 7.02it/s]
tensor([16.5260, 53.2245, 25.6311, 4.3723, 32.4923, 17.3056, 3.8944, 25.6400,
        15.9050, 4.0992], grad_fn=<IndexBackward0>)
tensor([12.3700, 69.3770, 19.4020, 2.1362, 60.1120, 16.1970, 2.1042, 46.9250,
        16.8400, 2.1878])

Epoch 0018 | Training loss 11.491714 | Training R2 0.642481 | Validation loss 14.003984 | Validation R2 0.520950
Best loss 13.955899 | Best epoch 0017

100%##### 672/672 [01:34<00:00, 7.13it/s]
tensor([12.2800, 60.9434, 23.6940, 3.7652, 41.1423, 23.2139, 4.3050, 37.7644,
        21.6612, 10.9115, 4.7921, 33.1001, 17.9507, 9.4201, 4.5705],
        grad_fn=<IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2970, 62.7360,
        19.2460, 7.4859, 3.3370, 62.9420, 16.8690, 6.5660, 3.3492])

Epoch 0019 | Training loss 10.620493 | Training R2 0.694636 | Validation loss 12.171540 | Validation R2 0.638123
Best loss 12.171540 | Best epoch 0019

100%##### 672/672 [01:35<00:00, 7.00it/s]
tensor([17.7791, 60.7902, 21.0121, 3.3622, 36.1535, 18.7510, 3.0016, 34.5173,
        18.5345, 3.7166], grad_fn=<IndexBackward0>)
tensor([13.0520, 73.2500, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517, 62.2630,
        23.6030, 4.7676])

Epoch 0020 | Training loss 9.667159 | Training R2 0.746996 | Validation loss 11.243977 | Validation R2 0.691177
Best loss 11.243977 | Best epoch 0020

100%##### 672/672 [01:37<00:00, 6.90it/s]
tensor([ 6.4277, 43.0652, 10.0547, 0.0505], grad_fn=<IndexBackward0>)
tensor([ 1.7700, 53.9210, 16.2500, 5.2152])

Epoch 0021 | Training loss 9.009152 | Training R2 0.780266 | Validation loss 9.970053 | Validation R2 0.756001
Best loss 9.970053 | Best epoch 0021

100%##### 672/672 [01:38<00:00, 6.79it/s]
tensor([ 7.1524, 44.6963, 2.6736, -0.0070, -1.0314, 12.0053, 3.2542,
        0.2715, -0.0505, 10.7207, 4.6720, 1.5571, 0.3930],
        grad_fn=<IndexBackward0>)
tensor([ 5.1825, 48.9670, 16.0790, 6.3620, 3.6307, 2.7427, 18.1490, 6.0004,
        3.0009, 2.9310, 14.1770, 7.0320, 4.0131, 0.8131])

Epoch 0022 | Training loss 8.104481 | Training R2 0.822100 | Validation loss 8.800013 | Validation R2 0.807035
Best loss 8.000013 | Best epoch 0022

100%##### 672/672 [01:45<00:00, 6.36it/s]
tensor([ 9.0191, 62.1309, 0.5210, -0.0926, 2.1431], grad_fn=<IndexBackward0>)
tensor([ 2.7053, 66.9500, 2.7400, 5.3342, 2.7053])

Epoch 0023 | Training loss 8.010061 | Training R2 0.826300 | Validation loss 9.681182 | Validation R2 0.771057
Best loss 8.000013 | Best epoch 0022

100%##### 672/672 [01:57<00:00, 5.70it/s]
tensor([ 3.4122, 6.5300, 3.7621, -1.5433, 25.0093, 7.9504, 1.0656, -0.6040,
        -1.0974, 7.6044, 3.0400, -1.3320, 15.6097, 3.6924, -0.7531, -1.4107,
        17.0910, 4.1631, -0.1990, -1.6500, 11.6507, -1.1651, -2.1033, 22.0726,
        5.0300, -0.3096, -2.2767, 22.2590, 5.2173, -0.0715, -2.5760, 21.4615,
        3.5346, -1.2009, 7.7002, 20.7264, 1.0163, -2.2034],
        grad_fn=<IndexBackward0>)
tensor([ 3.7604, 12.0090, 4.9213, 1.9207, 47.7030, 15.0700, 5.0201, 2.6054,
        1.7625, 15.0020, 1.0540, 1.9640, 29.0070, 9.7020, 3.2372, 2.0224,
        33.9450, 11.2970, 4.4000, 2.0120, 24.7420, 3.7604, 2.0126, 40.9190,
        15.4550, 5.1565, 2.0125, 40.9190, 15.4550, 5.1565, 2.0125, 40.9190,
        13.2120, 5.1565, 2.0125, 40.9190, 11.2950, 3.7604])

Epoch 0024 | Training loss 7.332561 | Training R2 0.854441 | Validation loss 7.375947 | Validation R2 0.867106
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:20<00:00, 4.79it/s]
tensor([17.5115, 75.5000, 24.1151, 5.0300, 47.0900, 15.6007, 4.7301, 40.6322,
        3.4470, 40.0260, 15.2362], grad_fn=<IndexBackward0>)
tensor([17.5030, 71.0050, 22.2940, 5.9000, 49.2230, 14.1200, 2.9076, 52.3500,
        3.1770, 44.7320, 17.5030])

Epoch 0025 | Training loss 8.509421 | Training R2 0.803967 | Validation loss 9.115965 | Validation R2 0.797010
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:27<00:00, 4.55it/s]
tensor([ 9.7400, 43.1030, 33.0272, 24.0104, 12.7070, 8.0704, 4.5704, 2.5600,
        37.6600, 14.1537, 6.5239, 4.7297, 40.0373, 15.7062, 7.0193, 6.2941,
        41.6007, 24.4670, 7.7723, 7.5000, 42.2460, 14.0500, 10.3533, 0.0096,
        42.0000, 10.5400, 11.0404, 9.2420, 43.5300, 17.5000, 11.5147, 9.0405,
        44.1107, 19.0935, 11.9677, 10.3997, 44.0415, 20.4000],
        grad_fn=<IndexBackward0>)
tensor([12.5000, 42.0000, 34.0410, 24.5230, 12.4040, 7.4420, 3.7669, 1.3563,
        42.1900, 12.2400, 3.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3305,
        43.0630, 20.0330, 1.9210, 1.3667, 43.0000, 8.0969, 3.7979, 1.3674,
        42.5300, 12.3470, 3.7496, 1.3500, 42.0000, 10.5230, 3.7000, 1.3642,
        43.0000, 12.5000, 3.7977, 1.3674, 43.0000, 12.5000])

Epoch 0026 | Training loss 7.642062 | Training R2 0.841000 | Validation loss 9.652371 | Validation R2 0.772410
Best loss 7.375947 | Best epoch 0024

100%##### 672/672 [02:28<00:00, 4.51it/s]
tensor([ 8.1295, 15.1995, 3.0024, 30.7570, 16.0000], grad_fn=<IndexBackward0>)
tensor([12.0470, 12.6000, 1.0025, 53.5960, 12.0470])

Epoch 0027 | Training loss 6.217919 | Training R2 0.895331 | Validation loss 6.709231 | Validation R2 0.890045
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:32<00:00, 4.41it/s]
tensor([ 2.9591, 20.0022, 0.4070, 41.0720, 53.1140, 0.7645, 43.0057, 15.5036,
        2.9654, 1.1200, 14.4033, 3.0000, 1.5330, 17.2710, 4.1735, 2.0491,
        5.0074, 2.6229, 7.1752, 3.4310, 51.3901, 6.0001, 3.6774, 0.0776,
        4.6272, 41.4533, 1.2000, 4.7510], grad_fn=<IndexBackward0>)
tensor([ 0.9007, 13.2440, 1.0495, 44.2920, 11.1530, 1.0742, 43.0160, 13.4300,
        2.0234, 1.0040, 12.6990, 3.2420, 1.0004, 15.4190, 3.2397, 1.0054,
        3.3101, 1.0273, 4.0077, 1.0220, 53.4230, 3.3111, 1.0275, 4.0042,
        1.0203, 40.7000, 3.0721, 0.9007])

Epoch 0028 | Training loss 6.206502 | Training R2 0.895715 | Validation loss 7.057061 | Validation R2 0.870321
Best loss 6.709231 | Best epoch 0027

100%##### 672/672 [02:37<00:00, 4.26it/s]
tensor([ 7.6626, 77.2475, 59.0001, 40.7000, 39.5000, 13.1140, 0.4002, -2.0069,
        -3.0000, 59.4931, 14.3002, 1.0000, -1.0112, 59.4113, 14.9600, 2.1040,
        -0.3003, 60.1007, 15.7402, 2.9394, 0.3230], grad_fn=<IndexBackward0>)
tensor([ 1.7195, 93.2000, 73.0070, 62.0300, 53.2360, 26.3000, 11.4010, 7.5733,
        4.9950, 75.1900, 26.0070, 10.1920, 5.0047, 73.0000, 26.4440, 10.0100,
        5.0000, 74.0070, 26.5260, 10.0000, 5.0220])

Epoch 0029 | Training loss 5.044729 | Training R2 0.907510 | Validation loss 5.710409 | Validation R2 0.920344
Best loss 5.710409 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 3 --model 2 --save fold_3 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([ 2.0100, 6.4742, 6.0027, 6.0312, 6.9042, 10.4000, 10.0000],
        grad_fn=<IndexBackward0>)
tensor([15.0020, 56.9500, 15.1310, 4.2726, 1.4454, 56.5500, 15.0020])

Epoch 0001 | Training loss 25.500470 | Training R2 -0.772760 | Validation loss 32.346756 | Validation R2 -1.555026
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:32<00:00, 7.27it/s]
tensor([1.0030, 5.0073, 5.0073, 5.1375, 5.1977], grad_fn=<IndexBackward0>)
tensor([0.1017, 6.2759, 4.0730, 0.0292, 0.1017])
```

Epoch 0002 | Training loss 25.551172 | Training R2 -0.767465 | Validation loss 33.349823 | Validation R2 -1.716795
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:33<00:00, 7.22it/s]
tensor([5.6753, 9.1968, 9.1528, 9.1878, 9.0680, 12.3688, 12.3259, 12.2829, 12.2460, 15.6801, 12.6373, 15.5945, 15.5579, 18.0876, 18.8448, 18.0021, 18.7654, 22.0656, 22.0229, 21.9801, 21.9435, 25.1256, 25.0829, 25.0402, 25.0036, 28.1739, 28.1312, 28.0886, 28.0520, 31.1455, 31.1029, 31.0603, 31.0238, 34.1763, 34.0912, 34.0547, 37.1030, 37.0544, 37.0118, 40.1939, 40.1514, 40.1089, 40.0725, 43.2250, 43.1825, 43.1401, 43.1036, 46.1381, 46.0957, 46.0532, 46.0168, 48.9333, 48.8909, 48.8121, 51.7089, 51.6685, 51.6222, 54.7681, 54.6392, 57.7422, 57.6999, 57.6637],
grad_fn=<IndexBackward0>)

tensor([1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813, 1.6846, 42.0210, 13.2660, 4.4688, 1.7581, 41.6580, 12.9060, 4.3470, 1.7185, 41.2450, 12.7800, 4.3843, 1.6937, 39.8740, 12.3490, 4.1591, 1.6366, 39.6830, 12.2880, 4.1388, 1.6285, 38.6890, 11.9880, 4.0377, 1.5888, 39.3970, 12.2020, 4.1098, 1.6171, 16.2880, 4.6939, 1.5810, 39.7140, 12.3040, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 1.6182, 37.9210, 11.7380, 3.9642, 1.6598, 36.4990, 11.3180, 1.4909, 11.3478, 3.8219, 1.5038, 39.1180, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0003 | Training loss 25.064499 | Training R2 -0.700776 | Validation loss 33.287090 | Validation R2 -1.706584
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:34<00:00, 7.12it/s]
tensor([11.9925, 16.1007, 15.6565, 14.7926, 18.7813, 18.1950, 17.1649],
grad_fn=<IndexBackward0>)

tensor([13.8520, 73.2560, 25.4840, 4.4909, 62.8640, 23.5240, 4.7517])

Epoch 0004 | Training loss 19.5080549 | Training R2 -0.837956 | Validation loss 22.115347 | Validation R2 -0.194696
Best loss 22.115347 | Best epoch 0004

100%##### 672/672 [01:32<00:00, 7.30it/s]
tensor([11.7457, 16.1828, 15.2492], grad_fn=<IndexBackward0>)

tensor([18.2960, 46.2360, 13.6630])

Epoch 0005 | Training loss 17.637889 | Training R2 0.157863 | Validation loss 18.753033 | Validation R2 0.140961
Best loss 18.753033 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([18.9480, 25.6120, 24.2652, 21.7064, 27.7522, 26.0064, 22.9544, 28.8005, 26.7267, 22.9641], grad_fn=<IndexBackward0>)

tensor([13.8520, 73.2560, 25.4840, 4.4909, 62.8640, 23.5240, 4.7517, 62.2630, 23.6030, 4.7676])

Epoch 0006 | Training loss 17.212334 | Training R2 0.197937 | Validation loss 18.404135 | Validation R2 0.172628
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([7.4809, 16.4973, 14.5521, 12.8453, 11.0999, 10.8038, 14.5344, 11.6942, 9.5260, 9.1614], grad_fn=<IndexBackward0>)

tensor([0.4160, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5080, 1.7944, 0.4453, 0.3538])

Epoch 0007 | Training loss 18.241096 | Training R2 0.099195 | Validation loss 21.649376 | Validation R2 -0.144882
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([21.2631, 37.7940, 28.8175, 35.9444, 28.1752, 40.1245, 34.2910, 33.3075, 27.6585, 19.4056, 23.0779, 19.0806, 24.1141, 21.0171],
grad_fn=<IndexBackward0>)

tensor([20.1800, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441, 78.0070, 24.2140, 3.3317, 23.8640, 3.2036, 23.7020, 3.2723, 61.1610, 20.1800])

Epoch 0008 | Training loss 15.808021 | Training R2 0.317229 | Validation loss 17.267464 | Validation R2 0.271672
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:28<00:00, 7.56it/s]
tensor([29.5514, 33.9478, 33.5819, 33.0550, 31.7000, 36.2072, 34.6201, 32.9590, 35.4917, 37.4942, 37.8410, 33.2047, 37.4423, 32.1409, 36.2251, 30.2793, 34.2453, 27.6422, 31.5599, 24.2538, 28.0946, 21.8433, 24.2154],
grad_fn=<IndexBackward0>)

tensor([66.9750, 34.8300, 30.4800, 27.1220, 19.3810, 59.4210, 39.4690, 28.2220, 45.4640, 32.5130, 71.1690, 34.2430, 72.7160, 35.0360, 72.9860, 35.1970, 73.1260, 35.2700, 73.7120, 35.5420, 73.9500, 35.6660, 66.9750])

Epoch 0009 | Training loss 15.588125 | Training R2 0.342165 | Validation loss 17.531309 | Validation R2 0.249244
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([22.3988, 44.0035, 38.3123, 27.5719, 42.2598, 33.7127, 17.9093, 31.7069, 21.5951, 15.1084, 21.0086, 18.1968, 14.7075, 19.6320, 17.6338, 14.6714, 18.9939, 17.1625, 14.7096, 15.3096, 16.8863, 14.2772, 17.6025, 16.0937, 14.1760, 16.9282, 15.6259, 13.6686, 16.4278, 15.1707],
grad_fn=<IndexBackward0>)

tensor([22.0850, 73.4140, 23.4000, 3.5402, 76.4500, 24.6100, 3.7109, 76.3100, 24.5840, 3.7130, 74.0510, 21.1050, 3.7013, 75.8210, 24.4200, 3.6093, 74.9130, 24.1510, 3.6483, 73.3630, 23.6320, 3.5700, 72.1350, 23.2310, 3.5094, 70.4750, 19.6300, 3.4295, 70.9820, 22.8850])

Epoch 0010 | Training loss 15.053199 | Training R2 0.306539 | Validation loss 16.905653 | Validation R2 0.301874
Best loss 16.905653 | Best epoch 0010

100%##### 672/672 [01:31<00:00, 7.30it/s]
tensor([18.1234, 47.1816, 39.9245], grad_fn=<IndexBackward0>)

tensor([7.2340, 79.9040, 38.3950])

Epoch 0011 | Training loss 14.768456 | Training R2 0.409528 | Validation loss 16.615559 | Validation R2 0.325627
Best loss 16.615559 | Best epoch 0011

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([11.6720, 32.8382, 24.0419, 7.9924, 23.3818, 12.4458, 8.1120, 14.4407, 11.5844, 8.4578], grad_fn=<IndexBackward0>)

tensor([7.1200, 40.3090, 16.0700, 2.5997, 40.2000, 10.9370, 2.6928, 34.4200, 12.7210, 2.7225])

Epoch 0012 | Training loss 14.076530 | Training R2 0.463561 | Validation loss 15.982700 | Validation R2 0.376014
Best loss 15.982700 | Best epoch 0012

100%##### 672/672 [01:29<00:00, 7.61it/s]
tensor([15.4109, 37.7438, 26.4691, 7.0004, 27.0034, 15.1891],
grad_fn=<IndexBackward0>)

tensor([15.6310, 53.5120, 15.1840, 1.6724, 54.8710, 15.6310])

Epoch 0013 | Training loss 13.712152 | Training R2 0.490973 | Validation loss 15.644684 | Validation R2 0.402134
Best loss 15.644684 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([12.0577, 36.3803, 23.6637, 11.4284, 3.9802, 24.7131, 13.2179, 7.2145, 3.9259, 17.0060, 11.4405, 7.1599, 4.1007, 14.8795, 10.1405, 7.4436, 5.7456, 12.6300, 10.5705, 8.0004, 7.5162, 13.0429, 11.6313, 9.6312, 8.1763, 13.7002, 12.1540, 10.3492, 8.4799, 14.0624, 12.3707],
grad_fn=<IndexBackward0>)

tensor([15.8670, 48.0200, 15.0320, 5.2611, 2.1393, 49.5140, 15.6140, 5.4648, 2.2222, 49.5800, 15.6390, 5.4735, 2.2257, 49.6100, 15.6440, 5.4753, 2.2264, 49.5890, 15.6410, 5.4740, 2.2259, 49.5930, 15.6410, 4.7118, 2.2260, 49.5930, 15.6410, 5.4742, 2.2260, 50.3130, 15.8670])

Epoch 0014 | Training loss 13.242213 | Training R2 0.525266 | Validation loss 15.322500 | Validation R2 0.426506
Best loss 15.322500 | Best epoch 0014

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([5.4798, 30.7003, 14.7006, 2.5093, -1.7006, 8.5024, 1.9909, -1.6791],
grad_fn=<IndexBackward0>)

tensor([1.7436, 45.8730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866])

Epoch 0015 | Training loss 12.924000 | Training R2 0.547002 | Validation loss 14.716954 | Validation R2 0.470939
Best loss 14.716954 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([15.6160, 55.2221, 16.2939, 8.2061, 24.2009], grad_fn=<IndexBackward0>)

tensor([16.1690, 59.8340, 5.3050, 1.4892, 16.1690])

Epoch 0016 | Training loss 11.898344 | Training R2 0.616732 | Validation loss 14.322660 | Validation R2 0.490908
Best loss 14.322660 | Best epoch 0016

100%##### 672/672 [01:33<00:00, 7.17it/s]
tensor([12.7216, 59.7177, 25.1669, 4.2772, 34.5799, 21.0603, 9.3700, 3.6991, 31.5247, 18.5450, 8.0795, 3.1359, 25.5747, 15.5161, 5.9220],
grad_fn=<IndexBackward0>)

tensor([4.0299, 49.1500, 18.3400, 1.7573, 53.2860, 17.7690, 5.0245, 1.7018, 65.7810, 20.9510, 4.9462, 1.6753, 64.1100, 17.0690, 4.0299])

Epoch 0017 | Training loss 11.401729 | Training R2 0.640858 | Validation loss 13.213098 | Validation R2 0.573407
Best loss 13.213098 | Best epoch 0017

100%##### 672/672 [01:36<00:00, 6.96it/s]
tensor([2.7003, 32.5371, 27.0000, 2.3056, 5.2560, 9.5199, 5.4553, 2.9917, 0.8526, 27.3170, 15.6950, 7.0300, 3.1720, 24.6290, 14.8523, 8.5628, 4.3510, 22.1035, 15.0576, 8.9973, 5.4540, 22.2026, 13.7354, 9.1169, 6.3164, 22.1400, 5.4240, 9.4095, 7.1009, 21.7399, 14.4235, 10.2003, 8.0124, 21.3545, 11.1401, 8.0666, 20.7642, 15.1376, 11.6578, 9.4312, 20.2414, 15.3670, 12.0332, 10.2129, 21.1608, 16.4321, 13.0078, 10.8106, 21.6508, 17.0206, 13.6300, 11.4462, 22.2054, 17.6234, 14.2651, 12.1728, 10.4076, 15.0317], grad_fn=<IndexBackward0>)

tensor([2.7419, 28.6490, 21.3500, 16.8100, 8.0504, 4.9078, 2.5526, 1.5643, 0.9507, 44.6470, 8.7098, 2.7058, 1.0403, 43.9200, 8.6592, 2.7445, 1.0300, 44.7000, 8.0004, 2.7720, 1.0407, 45.3100, 7.5011, 2.8303, 1.0630, 45.7270, 9.0111, 2.8500, 1.0727, 45.7350, 9.0137, 2.8560, 1.0730, 46.3300, 2.8935, 1.0060, 44.3500, 8.7473, 2.7724, 1.0413, 31.3930, 7.5594, 2.7405, 1.0620, 43.9420, 8.6636, 2.7469, 1.0313, 43.7170, 8.6145, 2.7009, 1.0257, 43.3150, 8.5370, 2.7000, 8.6510, 2.7419])

Epoch 0018 | Training loss 10.813417 | Training R2 0.683441 | Validation loss 13.203379 | Validation R2 0.574166
Best loss 13.203379 | Best epoch 0018

```
100%#####| 672/672 [01:32<00:00, 7.23it/s]
tensor([ 9.7498, 40.5504, 13.2881, 0.8898, 25.9407, 14.4120, 2.2655, 1.0768,
        24.7947, 14.0786, 1.6502], grad_fn=IndexBackward0>)
tensor([ 7.3688, 43.7308, 6.9218, 2.7685, 46.9550, 18.0700, 3.8155, 2.9446,
        46.1300, 18.1450, 2.9568])

Epoch 0019 | Training loss 10.473630 | Training R2 0.703023 | Validation loss 13.268398 | Validation R2 0.569962
Best loss 13.203379 | Best epoch 0018

100%#####| 672/672 [01:37<00:00, 6.90it/s]
tensor([ 2.5559, 19.4985, 2.8311, 33.7559, 17.7553, 2.5439],
        grad_fn=IndexBackward0>)
tensor([ 0.9087, 13.2440, 1.0495, 44.2928, 11.1530, 1.0742])

Epoch 0020 | Training loss 9.496670 | Training R2 0.755842 | Validation loss 10.343183 | Validation R2 0.738677
Best loss 10.343183 | Best epoch 0020

100%#####| 672/672 [01:43<00:00, 6.52it/s]
tensor([ 6.5408, 27.2245, 21.7968, 17.0160, 14.4693, 9.4895, 26.6533, 19.8093,
        14.0560, 29.3762, 22.2809, 16.0390, 30.4309, 16.7182, 30.6311, 16.9595,
        30.6151, 17.0785, 30.7507, 17.0520, 30.7647, 16.8084, 30.8296, 16.6525,
        30.7940, 16.4834, 27.5907, 16.3012, 30.4290, 16.1035, 30.8555, 15.9718,
        29.7875, 15.9149, 29.5319, 15.9832, 15.8856, 26.1478, 15.8869, 28.9241,
        15.8869, 28.7300, 15.8036, 20.5423, 15.0782, 28.2471, 15.7092, 28.3078,
        15.8788, 28.1359, 23.1410], grad_fn=IndexBackward0>)
tensor([13.4790, 18.0570, 13.8900, 10.7408, 8.5627, 4.6489, 22.6090, 10.6930,
        5.0463, 23.2430, 11.0050, 6.0691, 23.4230, 6.1265, 23.3150, 6.1035,
        23.4510, 6.1355, 23.4708, 6.1434, 23.1780, 6.0705, 23.2750, 6.0899,
        23.2850, 6.0940, 17.6110, 6.0951, 23.2930, 6.0960, 23.1390, 6.0582,
        23.1120, 6.0491, 23.1050, 6.0467, 6.0455, 17.4690, 6.0458, 23.1040,
        6.0422, 23.0900, 6.0454, 23.0970, 6.0451, 22.0050, 5.9719, 23.0390,
        6.0265, 22.6590, 13.4790])

Epoch 0021 | Training loss 7.951676 | Training R2 0.820823 | Validation loss 8.662682 | Validation R2 0.816495
Best loss 8.662682 | Best epoch 0021

100%#####| 672/672 [01:49<00:00, 6.14it/s]
tensor([ 5.0714, 41.2239, 10.6933, 1.8153, -1.6648, 32.1178, 11.6598, 2.8483],
        grad_fn=IndexBackward0>)
tensor([ 2.2708, 40.9040, 9.4533, 2.2722, 0.6695, 40.8030, 9.4476, 2.2708])

Epoch 0022 | Training loss 7.609004 | Training R2 0.843258 | Validation loss 8.749406 | Validation R2 0.813006
Best loss 8.662682 | Best epoch 0021

100%#####| 672/672 [02:05<00:00, 5.37it/s]
tensor([ 7.4991, 41.7259, 10.5250, 2.0759, -0.0212, -0.1132],
        grad_fn=IndexBackward0>)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724])

Epoch 0023 | Training loss 6.876002 | Training R2 0.872003 | Validation loss 6.808918 | Validation R2 0.886753
Best loss 6.808918 | Best epoch 0023

100%#####| 672/672 [02:26<00:00, 4.60it/s]
tensor([10.0532, 11.7250, 3.9000, 25.9015, 11.5955, 4.2005, 24.3615, 10.3238,
        4.4200], grad_fn=IndexBackward0>)
tensor([16.2540, 16.8150, 3.7307, 46.7120, 18.2510, 4.0494, 39.1610, 16.6090,
        4.1575])

Epoch 0024 | Training loss 6.344456 | Training R2 0.891027 | Validation loss 6.207634 | Validation R2 0.903429
Best loss 6.207634 | Best epoch 0024

100%#####| 672/672 [02:28<00:00, 4.54it/s]
tensor([ 1.6094, 23.4610, 3.5930, -1.5098, -2.5777, 30.9283, 8.1172, 1.3945,
        -1.0457], grad_fn=IndexBackward0>)
tensor([ 0.1405, 23.7240, 3.6020, 0.5996, 0.1266, 35.0020, 5.5209, 1.1669,
        0.1900])

Epoch 0025 | Training loss 7.193916 | Training R2 0.859093 | Validation loss 8.765650 | Validation R2 0.812311
Best loss 6.207634 | Best epoch 0024

100%#####| 672/672 [02:30<00:00, 4.46it/s]
tensor([ 8.0472, 41.0249, 8.3407, 2.1099, 36.6626, 12.1595],
        grad_fn=IndexBackward0>)
tensor([ 9.5449, 37.6970, 6.5141, 0.8206, 37.8140, 9.5449])

Epoch 0026 | Training loss 6.314091 | Training R2 0.892068 | Validation loss 7.142266 | Validation R2 0.875393
Best loss 6.207634 | Best epoch 0024

100%#####| 672/672 [02:34<00:00, 4.34it/s]
tensor([ 8.5633, 52.2490, 1.5635, 17.5187, 1.9039, 16.5124, 1.4483],
        grad_fn=IndexBackward0>)
tensor([ 5.0400, 57.3470, 1.4345, 18.1510, 1.4741, 17.6500, 1.4340])

Epoch 0027 | Training loss 6.005744 | Training R2 0.900719 | Validation loss 5.718658 | Validation R2 0.920116
Best loss 5.718658 | Best epoch 0027

100%#####| 672/672 [02:39<00:00, 4.20it/s]
tensor([ 7.0700, 42.2500, 11.1324, 3.1023, 1.2074, 2.6017, 21.2050, 6.0037,
        3.4100], grad_fn=IndexBackward0>)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
        1.7166])

Epoch 0028 | Training loss 6.592818 | Training R2 0.882328 | Validation loss 7.770147 | Validation R2 0.852522
Best loss 5.718658 | Best epoch 0027

100%#####| 672/672 [02:36<00:00, 4.30it/s]
tensor([ 3.7971, 35.3375, 0.4019, 1.6025, -0.3244, -0.4051, 13.2231, 2.0708,
        0.1061, 0.0965, 12.3060, 2.4095, 0.1007, 0.0419],
        grad_fn=IndexBackward0>)
tensor([ 0.4160, 38.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944,
        0.4453, 0.3530, 18.0300, 2.1303, 0.4190, 0.3322])

Epoch 0029 | Training loss 5.990502 | Training R2 0.902507 | Validation loss 5.604497 | Validation R2 0.923274
Best loss 5.604497 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py --fold 3 --model 3 --save fold 3 --lr 0.00005 --tol 1e-4 --epochs 30 --12 0.1
100%#####| 672/672 [01:27<00:00, 7.64it/s]
tensor([ 2.1999, 5.6524, 5.8418, 6.1936, 9.4868, 9.8432],
        grad_fn=IndexBackward0>)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521])

Epoch 0001 | Training loss 24.507435 | Training R2 -0.636649 | Validation loss 29.936550 | Validation R2 -1.109140
Best loss 29.936550 | Best epoch 0001

100%#####| 672/672 [01:28<00:00, 7.62it/s]
tensor([ 4.9043, 0.9507, 9.0036, 9.2166, 9.3305, 13.3845, 13.5179, 13.6512,
        13.7654, 17.0106, 17.9522, 10.0050], grad_fn=IndexBackward0>)
tensor([ 4.7756, 60.3800, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
        1.6243, 63.0070, 16.7090, 4.7756])

Epoch 0002 | Training loss 25.483650 | Training R2 -0.758136 | Validation loss 33.067993 | Validation R2 -1.671072
Best loss 29.936550 | Best epoch 0001

100%#####| 672/672 [01:27<00:00, 7.65it/s]
tensor([ 7.0014, 11.0011, 11.0285], grad_fn=IndexBackward0>)
tensor([13.0520, 60.0710, 23.1830])

Epoch 0003 | Training loss 24.522160 | Training R2 -0.627971 | Validation loss 32.016544 | Validation R2 -1.503911
Best loss 29.936550 | Best epoch 0001

100%#####| 672/672 [01:28<00:00, 7.61it/s]
tensor([ 7.3291, 10.1600, 10.0233, 9.0829], grad_fn=IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2040, 2.9020])

Epoch 0004 | Training loss 22.401255 | Training R2 -0.358544 | Validation loss 28.629200 | Validation R2 -1.002123
Best loss 28.629200 | Best epoch 0004

100%#####| 672/672 [01:28<00:00, 7.58it/s]
tensor([14.4474, 19.0099, 19.4276, 10.6136, 23.0021, 21.7736, 26.9901, 26.1418,
        24.3084, 28.5206, 26.5152], grad_fn=IndexBackward0>)
tensor([20.1000, 76.4000, 23.3070, 3.2069, 20.0640, 3.3441, 70.0070, 24.2140,
        3.3317, 23.0640, 3.2036])

Epoch 0005 | Training loss 19.169922 | Training R2 0.005122 | Validation loss 21.290998 | Validation R2 -0.107291
Best loss 21.290998 | Best epoch 0005

100%#####| 672/672 [01:29<00:00, 7.49it/s]
tensor([12.2300, 10.9201, 10.0005, 16.3241, 20.7707, 10.8313, 22.0400, 20.6343,
        24.4405, 21.9717], grad_fn=IndexBackward0>)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0059,
        15.0010, 2.0309])

Epoch 0006 | Training loss 19.678331 | Training R2 -0.040349 | Validation loss 22.492300 | Validation R2 -0.235770
Best loss 21.290998 | Best epoch 0005

100%#####| 672/672 [01:28<00:00, 7.61it/s]
tensor([ 0.0321, 16.7140, 15.5704, 14.4203], grad_fn=IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2040, 2.9020])

Epoch 0007 | Training loss 10.438383 | Training R2 0.079604 | Validation loss 20.071935 | Validation R2 -0.064132
```

Best loss 20.871935 | Best epoch 0007

100%#####| 672/672 [01:28<00:00, 7.61it/s]
tensor([0.2794, 0.7751, 0.5484, -0.3596, -1.8415, -1.9520, -2.6358, -3.3204, -2.3768, -4.0057, -5.6395], grad_fn=<IndexBackward0>)
tensor([0.2328, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164, 1.2248, 0.2320])

Epoch 0008 | Training loss 20.370321 | Training R2 -0.123375 | Validation loss 23.957869 | Validation R2 -0.402059
Best loss 20.871935 | Best epoch 0007

100%#####| 672/672 [01:31<00:00, 7.38it/s]
tensor([17.7417, 27.3907, 25.9303], grad_fn=<IndexBackward0>)
tensor([13.8520, 68.0710, 23.1830])

Epoch 0009 | Training loss 19.084763 | Training R2 0.013942 | Validation loss 21.900908 | Validation R2 -0.171647
Best loss 20.871935 | Best epoch 0007

100%#####| 672/672 [01:30<00:00, 7.44it/s]
tensor([17.3056, 25.6181, 24.2517, 20.7208, 26.5591, 24.7085, 21.8946, 26.8496, 15.2540, 22.2393], grad_fn=<IndexBackward0>)
tensor([17.8830, 55.3190, 16.9070, 2.1271, 56.8470, 17.5230, 2.1942, 57.7130, 17.7900, 2.2277])

Epoch 0010 | Training loss 17.859404 | Training R2 0.136499 | Validation loss 20.114540 | Validation R2 0.011697
Best loss 20.114540 | Best epoch 0010

100%#####| 672/672 [01:28<00:00, 7.56it/s]
tensor([8.7530, 19.8132, 16.0510, 16.2882, 22.7456, 19.5403, 19.2723], grad_fn=<IndexBackward0>)
tensor([9.2600, 25.5950, 5.0055, 3.7205, 26.2690, 4.4291, 3.8185])

Epoch 0011 | Training loss 18.237335 | Training R2 0.099566 | Validation loss 20.373814 | Validation R2 -0.013945
Best loss 20.114540 | Best epoch 0010

100%#####| 672/672 [01:29<00:00, 7.52it/s]
tensor([9.9975, 15.6876, 13.4450, 11.2903, 17.1275, 15.1765, 11.2384], grad_fn=<IndexBackward0>)
tensor([14.9510, 17.0860, 6.4340, 2.7857, 51.9570, 17.6200, 2.8727])

Epoch 0012 | Training loss 17.548340 | Training R2 0.166316 | Validation loss 19.443098 | Validation R2 0.076577
Best loss 19.443098 | Best epoch 0012

100%#####| 672/672 [01:28<00:00, 7.67it/s]
tensor([9.9177, 18.4395, 17.9721, 17.5216, 14.3823, 12.5939, 11.2551, 9.9186, 16.4753, 13.0464], grad_fn=<IndexBackward0>)
tensor([4.1835, 35.5470, 29.2780, 24.3620, 6.9018, 3.3599, 1.9581, 1.1412, 14.7460, 4.1835])

Epoch 0013 | Training loss 17.206947 | Training R2 0.198439 | Validation loss 19.141432 | Validation R2 0.105009
Best loss 19.141432 | Best epoch 0013

100%#####| 672/672 [01:31<00:00, 7.32it/s]
tensor([12.4364, 27.2565, 23.2094, 19.6116, 16.4919, 29.7080, 27.1892, 23.8359, 20.2024], grad_fn=<IndexBackward0>)
tensor([4.7756, 60.3800, 16.0390, 4.5623, 1.5531, 62.9500, 16.7740, 4.7714, 1.6243])

Epoch 0014 | Training loss 17.306837 | Training R2 0.189105 | Validation loss 19.362793 | Validation R2 0.084189
Best loss 19.141432 | Best epoch 0013

100%#####| 672/672 [01:31<00:00, 7.35it/s]
tensor([9.0598, 20.0499, 19.4907, 18.9320, 17.0166, 16.1479, 12.2752, 10.0752, 8.9780, 18.0707, 14.2077, 10.3545, 8.0562, 18.4221, 14.3102, 10.7028, 9.1701], grad_fn=<IndexBackward0>)
tensor([1.7205, 44.0430, 33.8580, 27.3170, 18.5670, 10.6030, 2.0810, 1.3084, 0.9431, 27.6900, 6.1533, 1.6721, 0.9567, 23.0690, 6.2359, 1.6946, 0.9695])

Epoch 0015 | Training loss 16.755896 | Training R2 0.239911 | Validation loss 19.031542 | Validation R2 0.115256
Best loss 19.031542 | Best epoch 0015

100%#####| 672/672 [01:30<00:00, 7.41it/s]
tensor([0.9502, 1.0904, 0.4565, -1.8299, -3.4424, -5.5529, -7.1404, -0.7240, 7.9102, -10.9310, -14.4209], grad_fn=<IndexBackward0>)
tensor([0.2328, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164, 1.2248, 0.2320])

Epoch 0016 | Training loss 16.645119 | Training R2 0.249928 | Validation loss 18.393700 | Validation R2 0.173566
Best loss 18.393700 | Best epoch 0016

100%#####| 672/672 [01:40<00:00, 6.68it/s]
tensor([6.8242, 20.9083, 15.5757, 10.6441, 6.0071, 20.2602, 15.3891, 10.3295, 6.0992, 19.2614, 16.2200, 12.1368, 8.1070], grad_fn=<IndexBackward0>)
tensor([1.6133, 40.1040, 12.3010, 10.0701, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813, 1.6846, 42.0210, 13.2660, 4.4680, 1.7581])

Epoch 0017 | Training loss 16.093096 | Training R2 0.290854 | Validation loss 17.970434 | Validation R2 0.211163
Best loss 17.970434 | Best epoch 0017

100%#####| 672/672 [01:38<00:00, 6.79it/s]
tensor([12.0932, 35.1505, 29.2555, 17.6236, 35.2379, 31.1231, 21.2395], grad_fn=<IndexBackward0>)
tensor([3.0765, 62.3000, 16.2100, 1.3937, 63.5960, 16.5530, 1.4231])

Epoch 0018 | Training loss 15.311383 | Training R2 0.365315 | Validation loss 16.984724 | Validation R2 0.295328
Best loss 16.984724 | Best epoch 0018

100%#####| 672/672 [01:47<00:00, 6.26it/s]
tensor([16.5402, 29.7475, 28.0376], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1650, 21.5660])

Epoch 0019 | Training loss 14.230635 | Training R2 0.451751 | Validation loss 15.854136 | Validation R2 0.386019
Best loss 15.854136 | Best epoch 0019

100%#####| 672/672 [02:00<00:00, 5.67it/s]
tensor([19.7466, 42.1145, 30.2600, 14.1118, 37.6093, 25.5962, 11.4744, 34.7414, 11.2551, 33.2510, 23.2312, 11.2077, 33.0895, 23.2144, 11.2046, 32.0959, 23.1463, 11.2140, 32.9000, 23.3097, 11.3044, 32.9221, 23.4245, 11.5103, 23.5826, 11.6663, 32.9310, 23.6521, 11.7840, 32.9144, 23.7639], grad_fn=<IndexBackward0>)
tensor([19.0400, 35.1050, 10.5150, 3.2922, 56.7650, 19.9600, 3.5504, 57.2050, 3.5796, 56.8250, 19.9970, 3.5558, 56.6030, 19.9170, 3.5416, 56.1070, 19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.8470, 3.5291, 19.0520, 3.5300, 56.3440, 19.8300, 3.5261, 56.4400, 19.8400])

Epoch 0020 | Training loss 12.025496 | Training R2 0.608497 | Validation loss 13.721763 | Validation R2 0.540072
Best loss 13.721763 | Best epoch 0020

100%#####| 672/672 [02:26<00:00, 4.60it/s]
tensor([11.1434, 49.1650, 25.8507, 12.7483], grad_fn=<IndexBackward0>)
tensor([0.4305, 64.0190, 10.8300, 2.4664])

Epoch 0021 | Training loss 12.230107 | Training R2 0.595061 | Validation loss 13.446256 | Validation R2 0.558356
Best loss 13.446256 | Best epoch 0021

100%#####| 672/672 [02:42<00:00, 4.13it/s]
tensor([7.8400, 35.5636, 31.0140, 27.4297, 23.0189, 15.3497, 39.0910, 28.7233, 10.0909, 41.4949, 10.0920, 10.0995, 41.0754, 30.6324, 20.1299, 30.6022, 20.5340, 30.5935, 21.5521], grad_fn=<IndexBackward0>)
tensor([12.5700, 31.0440, 25.2520, 20.7650, 17.3800, 10.5840, 40.6760, 22.0730, 13.9690, 43.5540, 24.6400, 15.0630, 44.0460, 35.6900, 15.2700, 35.0460, 15.3300, 35.0950, 15.3590])

Epoch 0022 | Training loss 9.790716 | Training R2 0.740488 | Validation loss 12.751149 | Validation R2 0.602037
Best loss 12.751149 | Best epoch 0022

100%#####| 672/672 [02:35<00:00, 4.31it/s]
tensor([14.1666, 61.5551, 29.6613, 8.0076, 50.5753, 24.2845, 8.0032], grad_fn=<IndexBackward0>)
tensor([6.2430, 65.0400, 25.1060, 4.2933, 69.2210, 23.5690, 4.5781])

Epoch 0023 | Training loss 8.497423 | Training R2 0.004519 | Validation loss 10.855521 | Validation R2 0.712147
Best loss 10.855521 | Best epoch 0023

100%#####| 672/672 [02:43<00:00, 4.10it/s]
tensor([15.0495, 61.9667, 20.1483, 10.4488], grad_fn=<IndexBackward0>)
tensor([18.4370, 63.6710, 21.1850, 2.2930])

Epoch 0024 | Training loss 7.026572 | Training R2 0.066335 | Validation loss 7.219308 | Validation R2 0.072690
Best loss 7.219308 | Best epoch 0024

100%#####| 672/672 [03:00<00:00, 3.72it/s]
tensor([15.0177, 53.2453, 22.2400, 13.1297, 52.0899, 24.2600], grad_fn=<IndexBackward0>)
tensor([20.1600, 53.7010, 19.0000, 3.5221, 56.3060, 20.1600])

Epoch 0025 | Training loss 22.096283 | Training R2 -0.321005 | Validation loss 31.622337 | Validation R2 -1.442621
Best loss 7.219308 | Best epoch 0024

100%#####| 672/672 [03:02<00:00, 3.69it/s]
tensor([9.0573, 64.0450, 19.9370, 7.2607, 4.3320, 59.0810, 10.9035, 3.0537], grad_fn=<IndexBackward0>)
tensor([7.4356, 60.5650, 21.1270, 9.6255, 3.0483, 61.0760, 21.7760, 3.9666])

Epoch 0026 | Training loss 6.403774 | Training R2 0.080900 | Validation loss 6.044273 | Validation R2 0.910760
Best loss 6.044273 | Best epoch 0026

100%#####| 672/672 [02:55<00:00, 3.82it/s]
tensor([6.9223, 61.5160, 10.7002, 3.0362, 10.1905, 2.9401, 10.2441, 2.0033], grad_fn=<IndexBackward0>)
tensor([2.0300, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0059])

Epoch 0027 | Training loss 6.205529 | Training R2 0.095747 | Validation loss 6.115032 | Validation R2 0.908659
Best loss 6.044273 | Best epoch 0026

100%#####| 672/672 [02:55<00:00, 3.84it/s]
tensor([6.0950, 60.9704, 50.3774, 41.0519, 20.7659, 16.2004, 8.0670, 3.7320, 2.6390], grad_fn=<IndexBackward0>)

```
tensor([10.7920, 67.0230, 50.2400, 40.4590, 28.8060, 18.4230, 11.9080, 6.6446,
        4.3127])

Epoch 0028 | Training loss 6.350976 | Training R2 0.890528 | Validation loss 5.888662 | Validation R2 0.915296
Best loss 5.888662 | Best epoch 0028

100%##### 672/672 [02:53<00:00, 3.871t/s]
tensor([ 5.4355, 52.7556, 12.8180, 2.5391], grad_fn=IndexBackward0)
tensor([ 1.6420, 52.0970, 9.8003, 1.9523])

Epoch 0029 | Training loss 6.320073 | Training R2 0.891863 | Validation loss 5.790334 | Validation R2 0.918101
Best loss 5.790334 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 3 --model 4 --save fold_3 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:29<00:00, 7.621t/s]
tensor([ 2.8724, 6.5957, 6.8080, 6.9899, 7.2021, 10.7213, 10.9348, 11.3314,
        14.8272, 15.0422, 15.1036, 15.4413, 18.9374, 19.1537, 19.5554, 23.0516,
        23.2693, 23.6736, 27.3578, 27.6082, 27.7960, 30.7720, 30.9930, 31.2133],
        grad_fn=IndexBackward0)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8403, 61.8760, 21.7760, 3.9666,
        61.4260, 21.6510, 16.6580, 3.9430, 61.4060, 21.6430, 3.9424, 61.4240,
        21.6460, 3.9429, 24.6050, 6.6517, 3.9430, 52.7130, 18.0040, 7.4356])

Epoch 0001 | Training loss 25.439198 | Training R2 -0.752008 | Validation loss 31.925747 | Validation R2 -1.409729
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:33<00:00, 7.171t/s]
tensor([ 3.2931, 5.3593, 5.3786, 5.3908, 5.4173, 5.4752, 7.2980, 7.3569,
        7.4149, 9.1766, 9.2928, 11.0515, 11.1676, 12.9117, 13.0278,
        14.7861, 14.9023, 16.6086, 16.7768, 18.5066, 18.6228, 20.3668, 20.4830,
        22.2271, 22.3433, 24.1067, 24.2035, 25.9476, 26.0638, 27.7936, 27.9099,
        29.6397, 29.7559, 31.4857, 31.6020, 33.4481, 35.1973, 35.2942, 37.0240,
        37.1403, 38.8701, 38.9864, 40.7162, 40.8325, 42.5338, 42.6501, 44.3800,
        44.4963, 46.1862, 46.2250], grad_fn=IndexBackward0)
tensor([13.4790, 18.0570, 13.0900, 10.7408, 8.5627, 4.6409, 22.6090, 10.6930,
        5.0463, 23.2430, 11.0050, 6.0091, 23.4230, 6.1265, 23.3150, 6.1035,
        23.4510, 6.1355, 23.4760, 6.1434, 23.1780, 6.0705, 23.2750, 6.0090,
        23.2850, 6.0940, 17.6110, 6.0951, 23.2930, 6.0960, 23.1300, 6.0502,
        23.1120, 6.0401, 23.1050, 6.0467, 6.0455, 17.4690, 6.0458, 23.1040,
        6.0402, 23.0900, 6.0454, 23.0970, 6.0451, 22.8050, 5.9719, 23.0390,
        6.0265, 22.6590, 13.4790])

Epoch 0002 | Training loss 26.376934 | Training R2 -0.883553 | Validation loss 34.834122 | Validation R2 -1.964010
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.391t/s]
tensor([ 7.8250, 11.8784, 11.8799, 11.8814, 11.8873, 11.8917, 11.8975, 11.9019,
        11.9062, 15.7652, 15.7763, 15.7875], grad_fn=IndexBackward0)
tensor([ 2.8054, 42.0900, 27.9040, 12.2340, 6.5023, 2.8006, 1.5499,
        0.8339, 54.9410, 12.2540, 2.8854])

Epoch 0003 | Training loss 24.805020 | Training R2 -0.665852 | Validation loss 32.632885 | Validation R2 -1.601243
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.611t/s]
tensor([ 8.7300, 11.7000, 11.3704, 11.2797, 11.2316, 13.9237, 13.7004,
        13.6669, 13.6202, 16.3320, 16.2147, 16.1207, 16.0738],
        grad_fn=IndexBackward0)
tensor([ 5.1025, 40.9670, 16.9790, 6.3620, 6.4307, 2.7427, 18.1400, 6.8004,
        3.8009, 2.9318, 14.1770, 7.0320, 4.0131, 3.0316])

Epoch 0004 | Training loss 22.594074 | Training R2 -0.382033 | Validation loss 29.154033 | Validation R2 -1.076304
Best loss 29.154033 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.541t/s]
tensor([13.0576, 17.9291, 17.4915, 16.8683], grad_fn=IndexBackward0)
tensor([48.1440, 50.7900, 7.5206, 1.1606])

Epoch 0005 | Training loss 19.321512 | Training R2 -0.010675 | Validation loss 21.662233 | Validation R2 -0.146242
Best loss 21.662233 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.551t/s]
tensor([11.5910, 16.2094, 16.0552], grad_fn=IndexBackward0)
tensor([21.0100, 30.1650, 21.5660])

Epoch 0006 | Training loss 10.806362 | Training R2 0.042500 | Validation loss 20.810762 | Validation R2 -0.057903
Best loss 20.810762 | Best epoch 0006

100%##### 672/672 [01:32<00:00, 7.261t/s]
tensor([13.7907, 24.9147, 23.5840, 22.4126, 21.0541, 27.8050, 26.2462, 23.2191],
        grad_fn=IndexBackward0)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8403, 61.8760, 21.7760, 3.9666])

Epoch 0007 | Training loss 18.502975 | Training R2 0.073144 | Validation loss 20.257120 | Validation R2 -0.002364
Best loss 20.257120 | Best epoch 0007

100%##### 672/672 [01:33<00:00, 7.181t/s]
tensor([ 7.3947, 16.2876, 14.5021], grad_fn=IndexBackward0)
tensor([ 0.9012, 40.1090, 18.2340])

Epoch 0008 | Training loss 17.884424 | Training R2 0.134077 | Validation loss 19.712755 | Validation R2 0.050785
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:32<00:00, 7.251t/s]
tensor([ 7.4039, 16.9333, 14.2522], grad_fn=IndexBackward0)
tensor([ 0.9012, 40.1090, 18.2340])

Epoch 0009 | Training loss 18.010396 | Training R2 0.121056 | Validation loss 20.077218 | Validation R2 -0.064670
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:32<00:00, 7.241t/s]
tensor([0.6249, 7.0101, 7.3241, 3.0194, 1.0690], grad_fn=IndexBackward0)
tensor([0.1817, 6.2759, 4.0730, 0.0292, 0.1817])

Epoch 0010 | Training loss 17.464170 | Training R2 0.174295 | Validation loss 20.522924 | Validation R2 -0.028041
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:32<00:00, 7.281t/s]
tensor([ 9.3226, 15.0665, 8.5315, 13.2728, 7.9733], grad_fn=IndexBackward0)
tensor([15.6300, 13.0430, 1.2600, 15.9120, 1.2050])

Epoch 0011 | Training loss 15.910845 | Training R2 0.316465 | Validation loss 18.190824 | Validation R2 0.190905
Best loss 18.190824 | Best epoch 0011

100%##### 672/672 [01:31<00:00, 7.381t/s]
tensor([ 4.3449, 16.5067], grad_fn=IndexBackward0)
tensor([ 2.4409, 16.0950])

Epoch 0012 | Training loss 15.060810 | Training R2 0.318949 | Validation loss 18.750023 | Validation R2 0.141237
Best loss 18.190824 | Best epoch 0011

100%##### 672/672 [01:32<00:00, 7.251t/s]
tensor([ 8.7004, 25.3828, 17.3558, 9.0191, 3.7226, 1.3463, 10.4619, 6.1137,
        2.9016, 10.1200, 7.5545, 6.0109, 4.6530], grad_fn=IndexBackward0)
tensor([ 7.2829, 42.0440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
        1.7166, 17.7690, 5.9424, 1.9898, 1.7019])

Epoch 0013 | Training loss 13.904661 | Training R2 0.476500 | Validation loss 15.886096 | Validation R2 0.383479
Best loss 15.886096 | Best epoch 0013

100%##### 672/672 [01:35<00:00, 7.051t/s]
tensor([ 7.0433, 27.5600, 16.0307, 7.2308, 0.1864, 9.9691, 3.3722, -0.6687,
        7.9056, 3.2674, -0.1207], grad_fn=IndexBackward0)
tensor([ 1.7436, 45.0730, 13.5250, 4.4509, 1.7225, 16.4400, 5.4192, 1.7866,
        16.0500, 5.2932, 1.7451])

Epoch 0014 | Training loss 12.929752 | Training R2 0.547405 | Validation loss 15.179044 | Validation R2 0.437194
Best loss 15.179044 | Best epoch 0014

100%##### 672/672 [01:33<00:00, 7.151t/s]
tensor([ 7.4332, 30.5729, 16.2302], grad_fn=IndexBackward0)
tensor([ 0.9012, 40.1090, 18.2340])

Epoch 0015 | Training loss 12.240400 | Training R2 0.593035 | Validation loss 14.446102 | Validation R2 0.490228
Best loss 14.446102 | Best epoch 0015

100%##### 672/672 [01:35<00:00, 7.011t/s]
tensor([ 4.0030, 7.0000, 7.0000, 7.0000, 7.0000, 9.0000, 10.0000, 11.0000,
        10.7448, 13.0000, 12.3932, 20.0000, 14.0000, 22.7131, 18.0000],
        grad_fn=IndexBackward0)
tensor([ 8.4605, 2.6000, 2.6000, 18.5760, 3.2225, 2.3435, 25.5770, 3.2261,
        2.3462, 3.2262, 2.3463, 25.6730, 2.3549, 30.2000, 8.4605])

Epoch 0016 | Training loss 11.735577 | Training R2 0.627147 | Validation loss 14.173969 | Validation R2 0.509258
Best loss 14.173969 | Best epoch 0016

100%##### 672/672 [01:37<00:00, 6.891t/s]
tensor([11.4500, 60.2137, 25.1021, 10.0511], grad_fn=IndexBackward0)
tensor([ 5.7740, 65.1420, 19.1070, 6.7725])
```

```
Epoch 0017 | Training loss 10.962422 | Training R2 0.674656 | Validation loss 14.008322 | Validation R2 0.521209
Best loss 14.008322 | Best epoch 0018

100%##### | 672/672 [01:42:00:00, 6.55it/s]
tensor([ 1.9511, 26.6897, 3.2896, -2.9883, -5.5958, 26.0863, 5.9632, -0.5994,
        -4.8749, 19.8183, 6.8784, -1.1292, -4.3855, 19.2795, 7.1646, 0.7781,
        -3.7893], grad_fn=IndexBackward0)
tensor([0.1465, 23.7248, 3.4820, 0.5996, 0.1266, 35.6928, 5.5289, 1.1669,
        0.1900, 35.4888, 5.5170, 0.8985, 0.1896, 35.4888, 7.1499, 1.8690,
        0.1896])

Epoch 0018 | Training loss 8.945731 | Training R2 0.783349 | Validation loss 10.894747 | Validation R2 0.751879
Best loss 10.894747 | Best epoch 0018

100%##### | 672/672 [02:03:00:00, 5.46it/s]
tensor([18.3829, 63.2539, 23.4179, 4.5281, 46.1589, 19.9418, 4.2955, 35.4959,
        16.3434, 3.1334, 26.7522, 12.8767, 3.3839, 6.2598],
        grad_fn=IndexBackward0)
tensor([17.6690, 69.9318, 19.6240, 2.8229, 70.4898, 19.8338, 2.8444, 57.7880,
        16.2388, 1.6738, 44.9250, 12.3938, 1.8128, 1.2753])

Epoch 0019 | Training loss 8.828597 | Training R2 0.789368 | Validation loss 9.154214 | Validation R2 0.795383
Best loss 9.154214 | Best epoch 0019

100%##### | 672/672 [02:19:00:00, 4.81it/s]
tensor([4.1644, 16.0128, -0.3138, 27.2210, 10.2752, -0.3314, 23.8783, 7.9699,
        -0.3345], grad_fn=IndexBackward0)
tensor([7.7265, 31.5168, 2.4943, 49.3870, 15.7188, 2.1485, 48.9948, 12.9580,
        1.7435])

Epoch 0020 | Training loss 7.317793 | Training R2 0.858256 | Validation loss 7.885971 | Validation R2 0.848092
Best loss 7.885971 | Best epoch 0020

100%##### | 672/672 [02:29:00:00, 4.49it/s]
tensor([ 8.4785, 47.7804, 13.9731, 1.8199, 41.2189, 11.3355, 1.4946, 40.8871,
        13.6775, 2.4164, 39.6342, 12.4571, 3.1625], grad_fn=IndexBackward0)
tensor([2.9463, 47.9168, 16.4838, 2.7894, 51.2518, 15.3778, 2.9173, 52.6378,
        18.1588, 2.9979, 52.4598, 15.7688, 2.9988])

Epoch 0021 | Training loss 7.842254 | Training R2 0.865738 | Validation loss 8.384834 | Validation R2 0.828265
Best loss 7.885971 | Best epoch 0020

100%##### | 672/672 [02:34:00:00, 4.36it/s]
tensor([ 4.4215, 3.2286, -0.1851, 12.2286, -0.1851,
        -1.8685, -1.9566, 9.4959, -0.7273, -2.5235, -2.5964, 8.4442, -2.1228,
        -3.3886, -3.3786], grad_fn=IndexBackward0)
tensor([ 8.4168, 38.8918, 7.1683, 1.7787, 0.4414, 0.3499, 11.5888, 1.7944,
        0.4453, 0.3538, 10.8388, 2.1382, 0.4398, 0.3322, 10.7828, 1.6812,
        0.4172, 0.3387])

Epoch 0022 | Training loss 9.585545 | Training R2 0.751258 | Validation loss 10.479862 | Validation R2 0.731724
Best loss 7.885971 | Best epoch 0020

100%##### | 672/672 [02:33:00:00, 4.38it/s]
tensor([ 7.7273, 48.1425, 12.7922, 1.4126, 44.4121, 10.8118, 1.8589, 44.7639,
        13.0878, 1.6967, 44.0385, 10.4389, 1.3453], grad_fn=IndexBackward0)
tensor([2.9463, 47.9168, 16.4838, 2.7894, 51.2518, 15.3778, 2.9173, 52.6378,
        18.1588, 2.9979, 52.4598, 15.7688, 2.9988])

Epoch 0023 | Training loss 6.380226 | Training R2 0.892531 | Validation loss 5.878633 | Validation R2 0.915584
Best loss 5.878633 | Best epoch 0023

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tensor([ 9.5449, 37.6978, 6.5141, 0.8286, 37.8140, 9.5449])

Epoch 0009 | Training loss 19.982319 | Training R2 -0.072350 | Validation loss 23.161474 | Validation R2 -0.310395
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([ 5.5922, 12.3538, 12.0286, 11.6848, 10.3945, 9.4810, 8.2765, 7.3738],
      grad_fn=IndexBackward0)
tensor([ 1.0783, 24.1780, 18.6400, 14.5698, 5.5683, 2.7131, 1.0403, 0.5869])

Epoch 0010 | Training loss 19.259192 | Training R2 -0.004165 | Validation loss 22.403614 | Validation R2 -0.226044
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([ 7.3921, 15.4699, 12.9607, 10.8167, 8.3234, 16.6326, 13.7868, 10.9830,
      0.6877, 16.5475, 14.0182, 11.2736, 8.7886, 15.5458, 13.3381, 10.9156,
      8.5450, 13.5284, 12.2548, 9.8752, 7.6965, 12.9978, 10.7930, 8.5555,
      6.4687, 11.1752, 9.0147, 5.6914, 6.6343, 6.9687, 4.7241, 2.6200,
      7.4725, 0.9743, 5.9411, 3.7118, -0.5238, 1.9366, 0.0317, -2.3644,
      -0.0617, -2.3752, -4.5300, -0.0170, -2.3218, -4.7410, -7.4294],
      grad_fn=IndexBackward0)
tensor([ 0.7450, 40.8280, 9.9731, 3.1421, 0.8166, 40.8800, 10.0110, 2.6018,
      0.8197, 40.8630, 10.0090, 2.6011, 0.8195, 39.2230, 9.6072, 2.4968,
      0.7866, 20.7580, 9.6081, 2.4950, 0.7861, 39.1950, 9.6080, 2.4949,
      0.7861, 37.7600, 9.2480, 1.3492, 0.7573, 9.2427, 2.4021, 0.7568,
      42.0710, 0.8422, 45.0040, 11.0200, 0.9023, 11.0300, 3.4749, 0.9031,
      11.0300, 2.8665, 0.9031, 45.0330, 11.0300, 2.8665, 0.7450])

Epoch 0011 | Training loss 18.370600 | Training R2 0.086359 | Validation loss 20.881422 | Validation R2 -0.065899
Best loss 20.881422 | Best epoch 0011

100%##### 672/672 [01:34<00:00, 7.14it/s]
tensor([ 6.5970, 11.4671, 7.1559, 11.7921, 9.5270, 7.0336, 11.2793, 9.2502,
      6.8140, 10.6249, 6.9877, 6.4409, 10.4517, 8.3311, 5.9003, 9.3900,
      5.0092, 8.5680, 6.4435, 3.8118, 7.4316, 5.2236, 2.4744, 6.0502,
      4.0339, 2.3123, 0.8804, 4.4167, 2.0192, -0.9629, 0.0474, -3.0528,
      -1.1970, -3.4509], grad_fn=IndexBackward0)
tensor([ 7.5182, 15.6800, 3.1867, 27.9940, 10.3868, 3.4217, 32.5420, 11.7100,
      3.4396, 32.5520, 13.2420, 3.4408, 40.3530, 12.2300, 3.5924, 29.4830,
      3.6040, 32.6680, 11.7570, 3.4535, 34.0010, 12.2340, 3.5934, 34.0970,
      13.6700, 6.4407, 3.0041, 34.1050, 12.2730, 3.6049, 12.2740, 3.0054,
      17.7370, 7.5182])

Epoch 0012 | Training loss 17.794364 | Training R2 0.142584 | Validation loss 20.198370 | Validation R2 0.003442
Best loss 20.198370 | Best epoch 0012

100%##### 672/672 [01:34<00:00, 7.10it/s]
tensor([18.1552, 22.1167, 10.2234, 23.1950, 20.6723, 16.5251, 21.2824, 18.8539,
      15.4051, 19.8181, 17.8533, 15.0033, 19.8660, 17.3397, 14.4262, 18.4159],
      grad_fn=IndexBackward0)
tensor([44.6430, 16.5660, 2.9442, 47.5600, 16.8100, 3.0078, 47.1240, 16.6500,
      2.9791, 47.5720, 16.8140, 3.0085, 47.0390, 16.6260, 2.9749, 46.6430])

Epoch 0013 | Training loss 17.672243 | Training R2 0.154502 | Validation loss 20.135670 | Validation R2 0.009620
Best loss 20.135670 | Best epoch 0013

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([15.7235, 21.9340, 21.4483, 20.9526, 19.3949, 21.5689, 25.2046, 23.9585,
      22.7006, 25.1933, 23.5000, 25.3662, 24.8580, 26.2581, 24.4513, 26.5796,
      24.7060, 27.2621, 24.8573, 26.8676, 25.2804], grad_fn=IndexBackward0)
tensor([20.9330, 26.7620, 19.9020, 13.0070, 17.6410, 46.5390, 29.5720,
      19.3340, 35.8900, 20.3400, 31.7000, 20.7250, 36.0000, 20.8550, 36.0910,
      20.9040, 42.0090, 20.9210, 36.9340, 20.9200])

Epoch 0014 | Training loss 16.964031 | Training R2 0.220911 | Validation loss 19.311337 | Validation R2 0.080950
Best loss 19.311337 | Best epoch 0014

100%##### 672/672 [01:33<00:00, 7.10it/s]
tensor([17.8863, 37.3666, 32.3489, 23.9999, 39.6020, 35.9349, 28.6494, 38.7055,
      35.1126, 28.4681, 37.0100, 33.2479, 29.0802, 30.2658, 36.5677, 31.0483,
      37.3955, 35.5460, 32.0257, 30.4204, 36.4113, 32.7683],
      grad_fn=IndexBackward0)
tensor([ 6.5237, 74.1680, 27.8270, 6.0609, 78.2140, 29.7730, 6.4850, 78.5910,
      29.9390, 6.5212, 78.6230, 29.9530, 6.5243, 6.5245, 63.0610, 6.4075,
      64.1270, 29.9080, 6.5146, 78.6170, 29.9510, 6.5237])

Epoch 0015 | Training loss 16.071217 | Training R2 0.300759 | Validation loss 18.356150 | Validation R2 0.176937
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:34<00:00, 7.09it/s]
tensor([16.5277, 44.4044, 39.2769, 27.7244, 45.0794, 40.7189, 32.3551, 44.8518,
      30.4719, 30.6090], grad_fn=IndexBackward0)
tensor([ 3.5346, 75.5620, 25.2640, 3.8933, 65.8520, 23.0200, 4.0963, 64.9500,
      19.9220, 4.0935])

Epoch 0016 | Training loss 16.231964 | Training R2 0.286701 | Validation loss 18.394156 | Validation R2 0.173525
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:33<00:00, 7.16it/s]
tensor([ 5.3319, 17.4150, 16.5360, 15.6327, 11.7102, 8.7342, 5.1355, 2.4699],
      grad_fn=IndexBackward0)
tensor([ 1.0703, 24.1780, 18.6400, 14.5698, 5.5683, 2.7131, 1.0403, 0.5869])

Epoch 0017 | Training loss 16.121244 | Training R2 0.296399 | Validation loss 18.390121 | Validation R2 0.173888
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:32<00:00, 7.29it/s]
tensor([ 8.2026, 28.0302, 26.0790, 23.8754, 20.0850, 16.5093, 11.9295, 6.6301,
      5.4420, 24.6061, 16.0090, 8.5940, 4.5533, 18.9753, 15.0602, 9.7732,
      6.4840], grad_fn=IndexBackward0)
tensor([ 4.0044, 39.7300, 31.0010, 22.1240, 13.8590, 8.3876, 4.4262, 2.7406,
      1.6970, 51.6670, 13.3870, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
      1.7009])

Epoch 0018 | Training loss 13.867579 | Training R2 0.479369 | Validation loss 15.791674 | Validation R2 0.390847
Best loss 15.791674 | Best epoch 0018

100%##### 672/672 [01:38<00:00, 6.82it/s]
tensor([ 6.1014e+00, 2.5520e+01, 1.4242e+01, 5.9700e+00, -2.2717e+00,
      1.6885e+01, 6.1398e+00, 3.2727e-01, -3.4941e+00, 1.1665e+01,
      5.4953e+00, 3.5982e-01, -3.4189e+00, 1.1026e+01, 5.0514e+00,
      7.2515e-04, -3.6842e+00], grad_fn=IndexBackward0)
tensor([ 0.7450, 40.8280, 9.9731, 3.1421, 0.8166, 40.8800, 10.0110, 2.6018,
      0.8197, 40.8630, 10.0090, 2.6011, 0.8195, 39.2230, 9.6072, 2.4968,
      0.7866])

Epoch 0019 | Training loss 12.710710 | Training R2 0.562610 | Validation loss 14.843241 | Validation R2 0.461020
Best loss 14.843241 | Best epoch 0019

100%##### 672/672 [01:46<00:00, 6.31it/s]
tensor([10.6566, 46.4607, 26.5691, 10.1913, 2.7001, 35.4857, 14.4463, 7.3089,
      1.1632], grad_fn=IndexBackward0)
tensor([ 4.4511, 55.9080, 16.9540, 4.6038, 2.0962, 47.9720, 12.9760, 5.8075,
      2.2130])

Epoch 0020 | Training loss 11.812094 | Training R2 0.622269 | Validation loss 13.195599 | Validation R2 0.674668
Best loss 13.195599 | Best epoch 0020

100%##### 672/672 [02:00<00:00, 5.56it/s]
tensor([10.1553, 18.2907, 5.9339, 0.7742, 24.4130, 11.2959, 0.2802, 10.9734,
      0.3400, 22.0324, 0.4522, 4.2867, 0.6211, 23.1974, 5.1732, 1.2618,
      0.8361, 8.2529, 1.1520, 23.7739, 4.9145, 1.9538, 1.5326, 9.5868],
      grad_fn=IndexBackward0)
tensor([14.9510, 17.0860, 6.4340, 2.7857, 51.9570, 17.6200, 2.8727, 17.5920,
      2.8681, 53.1470, 2.9466, 6.7516, 2.9232, 53.6570, 7.9009, 3.4200,
      2.9753, 11.9150, 2.9524, 53.4760, 6.8475, 3.4006, 2.9648, 14.9510])

Epoch 0021 | Training loss 10.502948 | Training R2 0.701358 | Validation loss 11.709469 | Validation R2 0.665077
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:24<00:00, 4.66it/s]
tensor([ 4.8642, 17.7674, 3.7490, -0.9090], grad_fn=IndexBackward0)
tensor([ 5.8404, 17.0220, 6.0592, 2.0044])

Epoch 0022 | Training loss 9.577409 | Training R2 0.751672 | Validation loss 12.240973 | Validation R2 0.633983
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:41<00:00, 4.17it/s]
tensor([10.1105, 54.1474, 47.1999, 40.6521, 34.9629, 18.5855, 10.9087, 5.3792,
      3.3003], grad_fn=IndexBackward0)
tensor([12.0510, 55.0900, 40.4200, 31.6660, 25.7020, 12.4200, 7.3585, 3.6646,
      2.1727])

Epoch 0023 | Training loss 7.726895 | Training R2 0.838364 | Validation loss 9.112268 | Validation R2 0.797174
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:36<00:00, 4.28it/s]
tensor([ 6.9046, 41.2925, 34.5210, 23.4426, 12.2643, 5.9180, 1.2359, -0.0414,
      -0.5204, 38.4061, 9.3305, -0.1005, -1.4074, 31.3701, 6.5204, -1.4669,
      -2.4291, 13.1051, 1.7246, -3.2997], grad_fn=IndexBackward0)
tensor([ 4.0044, 39.7300, 31.0010, 22.1240, 13.8590, 8.3876, 4.4262, 2.7406,
      1.6970, 51.6670, 13.3870, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
      1.7009, 18.7290, 4.4247, 1.6964])

Epoch 0024 | Training loss 9.422968 | Training R2 0.759617 | Validation loss 9.542447 | Validation R2 0.777572
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:51<00:00, 3.92it/s]
tensor([23.6239, 67.3576, 30.3424, 17.5067, 53.2716, 29.3855, 18.8101, 57.4094,
      31.0609, 19.9909, 59.0951], grad_fn=IndexBackward0)
tensor([42.1750, 56.1960, 7.7054, 0.4302, 32.9930, 7.7374, 0.4275, 41.1230,
      7.5177, 0.4154, 42.1750])

Epoch 0025 | Training loss 7.962917 | Training R2 0.828338 | Validation loss 9.609860 | Validation R2 0.774418
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [03:05<00:00, 3.63it/s]
tensor([ 4.8900, 45.6167, 9.5987, 0.1051, -0.9369, 39.9992, 8.5798,
      -0.3131, -1.5515, 39.4073, 9.3195, -0.3392, -2.4084, 37.1201,
```

```
8.8991, -0.9208, -3.5922, 35.8086, 8.4388, -1.9218, -4.8642,
33.2721, 7.2729, -3.1486, -6.2217, 31.8621, 6.4087, -4.3224,
-7.0873, 29.6215, 4.9850, -5.7174, -8.7939, 28.9284, 4.8174,
-4.7392, -9.4889, -2.845, -6.6377, -18.4594, 26.3385, 1.3159,
-8.2648, -11.1160, 24.3990, -0.4381, -9.1098, -11.8479, 21.2692,
-2.0180, -9.9080, -12.4354, 18.3385, -3.3384, -13.0876, -4.3371,
-11.5602, -13.8299, 17.7920, -14.3870, -4.9450, -12.6202, -15.1504],
grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813,
1.6846, 42.8210, 12.2600, 4.4680, 1.7501, 41.0580, 12.9060, 4.3470,
1.7105, 41.2450, 12.7800, 4.3043, 1.6937, 39.8740, 12.3490, 4.1591,
1.6366, 39.6830, 12.2880, 4.1388, 1.6285, 38.6890, 11.9800, 4.0377,
1.5880, 39.3970, 12.2020, 4.1098, 1.6171, 16.2880, 4.6939, 1.5810,
39.7140, 12.3840, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 4.6182,
37.9910, 11.7700, 3.9642, 1.5598, 36.4990, 11.3100, 1.4909, 11.3470,
3.8219, 1.5038, 39.1180, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0026 | Training loss 8.169349 | Training R2 0.819323 | Validation loss 8.438163 | Validation R2 0.826403
Best loss 8.438163 | Best epoch 0026

100%##### 672/672 [03:02<00:00, 3.69it/s]
tensor([ 6.5499, 48.5983, 15.1371, 3.5329], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0870, 7.1519])

Epoch 0027 | Training loss 6.878480 | Training R2 0.871910 | Validation loss 7.949504 | Validation R2 0.845635
Best loss 7.949504 | Best epoch 0027

100%##### 672/672 [02:58<00:00, 3.76it/s]
tensor([22.4853, 65.2880, 29.7628, 19.7173, 17.9791, 57.3877, 28.7129, 17.0198,
16.9415, 26.9971, 16.9828, 63.2698, 38.2553, 16.8464, 63.8235, 30.3975,
16.6602, 63.3403], grad_fn=<IndexBackward0>)
tensor([54.4230, 51.9620, 17.0410, 7.0369, 2.5077, 43.8090, 17.6270, 3.0059,
2.5940, 15.3480, 2.6174, 55.5800, 18.3240, 2.6966, 55.2450, 18.2160,
2.6086, 54.4230])

Epoch 0028 | Training loss 6.115299 | Training R2 0.898757 | Validation loss 5.728622 | Validation R2 0.919830
Best loss 5.728622 | Best epoch 0028

100%##### 672/672 [02:56<00:00, 3.81it/s]
tensor([ 9.6481, 86.3618, 29.5480, 5.6376, 78.3233, 26.1667, 6.2007, 78.0274,
24.1507, 6.6242], grad_fn=<IndexBackward0>)
tensor([ 3.5346, 75.5620, 25.2640, 3.8933, 65.0520, 23.0200, 4.0963, 64.9580,
19.9220, 4.0935])

Epoch 0029 | Training loss 6.373678 | Training R2 0.890021 | Validation loss 7.142794 | Validation R2 0.875375
Best loss 5.728622 | Best epoch 0028

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 4 --model 1 --save fold.4 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([ 2.8156, 6.4742, 6.6527, 6.8312, 6.9842, 10.4804, 10.6588],
grad_fn=<IndexBackward0>)
tensor([15.0620, 56.9590, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0001 | Training loss 25.580478 | Training R2 -0.772768 | Validation loss 32.346756 | Validation R2 -1.555826
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([1.9038, 5.0573, 5.0673, 5.1375, 5.1977], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0002 | Training loss 25.551172 | Training R2 -0.767465 | Validation loss 33.349823 | Validation R2 -1.716795
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:35<00:00, 7.06it/s]
tensor([ 5.6753, 9.1968, 9.1520, 9.1070, 9.0680, 12.3608, 12.3259, 12.2829,
12.2460, 15.0801, 15.0475, 15.0945, 15.0579, 18.0076, 18.0440, 18.0021,
18.7654, 22.0656, 22.0229, 21.9801, 21.9435, 25.1256, 25.0829, 25.0402,
25.0036, 28.1739, 28.1312, 28.0886, 28.0520, 31.1455, 31.1029, 31.0603,
31.0230, 34.1763, 34.1337, 34.0912, 34.0547, 37.1030, 37.0544, 37.0118,
40.1939, 40.1514, 40.1089, 40.0725, 43.1258, 43.1025, 43.1401, 43.1036,
46.1381, 46.0957, 46.0532, 46.0168, 48.9333, 48.8909, 48.8121, 51.7009,
51.6585, 51.6222, 54.7081, 54.6392, 57.7422, 57.6999, 57.6637],
grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813,
1.6846, 42.8210, 13.2600, 4.4680, 1.7501, 41.0580, 12.9060, 4.3470,
1.7105, 41.2450, 12.7800, 4.3043, 1.6937, 39.8740, 12.3490, 4.1591,
1.6366, 39.6830, 12.2880, 4.1388, 1.6285, 38.6890, 11.9800, 4.0377,
1.5880, 39.3970, 12.2020, 4.1098, 1.6171, 16.2880, 4.6939, 1.5810,
39.7140, 12.3840, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 4.6182,
37.9910, 11.7700, 3.9642, 1.5598, 36.4990, 11.3100, 1.4909, 11.3470,
3.8219, 1.5038, 39.1180, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0003 | Training loss 25.064499 | Training R2 -0.700776 | Validation loss 33.287090 | Validation R2 -1.706584
Best loss 32.346756 | Best epoch 0001

100%##### 672/672 [01:38<00:00, 6.82it/s]
tensor([11.9925, 16.1087, 15.6565, 14.7926, 18.7813, 18.1950, 17.1649],
grad_fn=<IndexBackward0>)
tensor([13.8520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517])

Epoch 0004 | Training loss 19.580549 | Training R2 -0.037956 | Validation loss 22.115347 | Validation R2 -0.194696
Best loss 22.115347 | Best epoch 0004

100%##### 672/672 [01:35<00:00, 7.03it/s]
tensor([11.7457, 16.1828, 15.2492], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0005 | Training loss 17.637089 | Training R2 0.157863 | Validation loss 18.753033 | Validation R2 0.140961
Best loss 18.753033 | Best epoch 0005

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([18.9408, 25.6120, 24.2652, 21.7064, 27.7522, 26.0064, 22.9544, 28.8085,
26.7267, 22.9661], grad_fn=<IndexBackward0>)
tensor([13.8520, 73.2560, 25.4040, 4.4909, 62.0640, 23.5240, 4.7517, 62.2630,
23.6030, 4.7676])

Epoch 0006 | Training loss 17.212334 | Training R2 0.197937 | Validation loss 18.404135 | Validation R2 0.172628
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:38<00:00, 7.39it/s]
tensor([ 7.4009, 16.4973, 14.5521, 12.8453, 11.0999, 10.8038, 14.5344, 11.6942,
9.5260, 9.1614], grad_fn=<IndexBackward0>)
tensor([ 0.4168, 38.0910, 7.1683, 1.7787, 0.4414, 0.3499, 11.5080, 1.7944,
0.4453, 0.3530])

Epoch 0007 | Training loss 18.241096 | Training R2 0.099195 | Validation loss 21.649376 | Validation R2 -0.144802
Best loss 18.404135 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.56it/s]
tensor([21.2631, 37.7968, 34.6909, 28.8175, 35.9441, 28.1752, 40.1245, 34.2910,
23.3075, 27.6505, 19.4056, 23.0779, 19.0806, 24.1141, 21.9171],
grad_fn=<IndexBackward0>)
tensor([20.1800, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441, 78.0070, 24.2140,
3.3317, 23.0640, 3.2036, 23.7020, 3.2723, 61.1610, 20.1800])

Epoch 0008 | Training loss 15.808021 | Training R2 0.317229 | Validation loss 17.267464 | Validation R2 0.271672
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([29.5514, 33.9478, 33.5019, 33.0550, 31.7000, 30.2072, 34.6201, 32.9590,
35.4917, 33.4942, 37.8410, 33.2047, 37.4423, 32.1499, 36.2251, 30.2793,
34.2453, 27.6422, 31.5599, 24.2530, 28.0946, 21.8433, 24.2154],
grad_fn=<IndexBackward0>)
tensor([64.9750, 34.8300, 30.4850, 27.1220, 19.3810, 59.4210, 39.4600, 28.2220,
45.4640, 32.5130, 71.1690, 34.2430, 72.7160, 35.8360, 72.9060, 35.1970,
73.1260, 35.2700, 73.7120, 35.5420, 73.9550, 35.6600, 66.9750])

Epoch 0009 | Training loss 15.588125 | Training R2 0.342165 | Validation loss 17.531309 | Validation R2 0.249244
Best loss 17.267464 | Best epoch 0008

100%##### 672/672 [10:16<00:00, 1.09it/s]
tensor([22.3908, 44.0035, 38.3123, 27.5719, 42.2598, 33.7127, 17.9093, 31.7069,
21.5951, 15.1004, 21.6006, 18.1968, 14.7075, 19.6320, 17.6338, 14.6714,
10.9939, 17.1625, 14.7096, 10.3096, 16.0063, 14.2772, 17.6625, 16.0937,
14.1760, 16.9282, 15.6259, 13.6606, 16.4278, 15.1707],
grad_fn=<IndexBackward0>)
tensor([22.8850, 73.4140, 23.4000, 3.5482, 76.4500, 24.6100, 3.7109, 76.3100,
24.5840, 3.7130, 76.0510, 21.1050, 3.7013, 75.8210, 24.4200, 3.6093,
74.9130, 24.1510, 3.6483, 73.3630, 23.6320, 3.5700, 72.1350, 23.2310,
3.5094, 70.4750, 19.6300, 3.4295, 70.9020, 22.8850])

Epoch 0010 | Training loss 15.053199 | Training R2 0.386539 | Validation loss 16.905653 | Validation R2 0.301074
Best loss 16.905653 | Best epoch 0010

8%##### | 51/672 [00:06<01:04, 9.63it/s] 8%##### | 54/672 [00:06<01:20, 7.70it/s] 8%#####
tensor([18.1234, 47.1816, 39.9245], grad_fn=<IndexBackward0>)
tensor([ 7.2340, 79.9040, 30.3950])

Epoch 0011 | Training loss 14.768456 | Training R2 0.409528 | Validation loss 16.615559 | Validation R2 0.325627
```

```
Best loss 16.615559 | Best epoch 0011

100%##### 672/672 [01:31<00:00, 7.35it/s]
tensor([11.6720, 32.8382, 24.0419, 7.9924, 23.3818, 12.4458, 8.1120, 14.4407,
        11.5844, 8.4578], grad_fn=IndexBackward0)
tensor([ 7.1280, 48.3090, 16.0790, 2.5997, 40.2000, 10.9370, 2.6928, 34.4200,
        12.7210, 2.7215])

Epoch 0012 | Training loss 14.076530 | Training R2 0.463561 | Validation loss 15.982788 | Validation R2 0.376014
Best loss 15.982788 | Best epoch 0012

100%##### 672/672 [01:33<00:00, 7.20it/s]
tensor([15.4109, 37.7430, 26.4691, 7.0804, 27.0834, 15.1891],
        grad_fn=IndexBackward0)
tensor([15.6310, 53.5120, 15.1840, 1.6724, 54.8710, 15.6310])

Epoch 0013 | Training loss 13.712152 | Training R2 0.490973 | Validation loss 15.644684 | Validation R2 0.402134
Best loss 15.644684 | Best epoch 0013

100%##### 672/672 [01:32<00:00, 7.29it/s]
tensor([12.8577, 36.3883, 23.6637, 11.4284, 3.9802, 24.7131, 13.2179, 7.2145,
        3.9259, 17.6060, 11.4485, 7.1599, 4.1087, 14.8795, 10.1405, 7.4436,
        5.7456, 12.6350, 10.5755, 8.8864, 7.3162, 13.8429, 11.6113, 9.6312,
        8.1763, 13.7002, 12.1540, 10.3492, 8.4799, 14.8624, 12.3707],
        grad_fn=IndexBackward0)
tensor([15.8670, 48.0290, 15.0320, 5.2611, 2.1393, 49.5140, 15.6140, 5.4648,
        2.2222, 49.5850, 15.6390, 6.4735, 2.2257, 49.6180, 15.6440, 5.4753,
        2.2264, 49.5890, 15.6410, 5.4740, 2.2259, 49.5930, 15.6410, 7.7118,
        2.2260, 49.5930, 15.6410, 5.4742, 2.2260, 50.3130, 15.8670])

Epoch 0014 | Training loss 13.242213 | Training R2 0.525266 | Validation loss 15.322500 | Validation R2 0.426506
Best loss 15.322500 | Best epoch 0014

100%##### 672/672 [01:33<00:00, 7.22it/s]
tensor([ 5.4708, 30.7803, 14.7806, 2.5093, -1.7086, 8.5024, 1.9989, -1.6791],
        grad_fn=IndexBackward0)
tensor([ 1.7436, 45.8730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866])

Epoch 0015 | Training loss 12.924088 | Training R2 0.547802 | Validation loss 14.716954 | Validation R2 0.470939
Best loss 14.716954 | Best epoch 0015

100%##### 672/672 [01:31<00:00, 7.32it/s]
tensor([15.6168, 55.2221, 16.2939, 8.2661, 24.2689], grad_fn=IndexBackward0)
tensor([16.1690, 59.8340, 5.3050, 1.4892, 16.1690])

Epoch 0016 | Training loss 11.898344 | Training R2 0.616732 | Validation loss 14.322660 | Validation R2 0.498908
Best loss 14.322660 | Best epoch 0016

100%##### 672/672 [01:31<00:00, 7.30it/s]
tensor([12.7216, 59.7177, 25.1669, 4.2772, 34.5799, 21.8603, 9.3780, 3.6991,
        31.5247, 19.5404, 8.0795, 3.1359, 25.5747, 15.5161, 5.9220],
        grad_fn=IndexBackward0)
tensor([ 4.0299, 69.1500, 18.3480, 1.7573, 53.2860, 17.7690, 5.0245, 1.7018,
        65.7810, 20.9510, 4.9462, 1.6753, 64.1100, 17.0690, 4.0299])

Epoch 0017 | Training loss 11.401729 | Training R2 0.648058 | Validation loss 13.213898 | Validation R2 0.573487
Best loss 13.213898 | Best epoch 0017

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([ 2.9063, 32.5171, 27.8092, 23.1816, 13.6546, 9.5199, 5.4563, 2.9917,
        0.8526, 27.3170, 15.6950, 7.0300, 3.1720, 24.6290, 14.8523, 8.5620,
        4.3510, 22.1035, 15.0576, 8.9973, 5.4540, 22.2026, 13.7354, 9.1169,
        6.3164, 22.1408, 14.2489, 9.6895, 7.1809, 21.7399, 14.4235, 10.2883,
        8.0124, 21.3545, 11.1481, 8.8666, 20.7642, 15.1376, 11.0578, 9.4312,
        20.2414, 15.3670, 12.0332, 10.2129, 21.1668, 16.4321, 13.0070, 10.8106,
        21.6568, 17.0286, 13.6380, 11.4462, 22.2054, 17.6234, 14.2651, 12.1728,
        18.4076, 15.0337], grad_fn=IndexBackward0)
tensor([ 2.7419, 28.6490, 15.3500, 16.8100, 8.0564, 4.9078, 2.5526, 1.5643,
        0.9507, 44.6470, 8.7098, 2.7858, 1.0463, 43.9280, 8.6592, 2.7445,
        1.0308, 44.7080, 8.8094, 2.7920, 1.0407, 45.3180, 7.5611, 2.8303,
        1.0630, 45.7270, 9.0111, 2.8508, 1.0727, 45.7350, 9.0137, 2.8568,
        1.0730, 46.3300, 8.8935, 1.0048, 44.3590, 8.7473, 2.7724, 1.0413,
        31.3930, 7.5594, 2.4035, 1.0628, 43.9420, 8.6636, 2.7459, 1.0313,
        43.7170, 8.6165, 2.7309, 1.0257, 43.3150, 8.5378, 2.7060, 1.0163,
        8.6510, 2.7419])

Epoch 0018 | Training loss 10.813417 | Training R2 0.683441 | Validation loss 13.203379 | Validation R2 0.574166
Best loss 13.203379 | Best epoch 0018

100%##### 672/672 [01:36<00:00, 6.99it/s]
tensor([ 9.7490, 48.5584, 13.2081, 0.8098, 25.9407, 14.4120, 2.2655, 1.0768,
        24.7947, 16.8706, 1.6502], grad_fn=IndexBackward0)
tensor([ 7.3680, 43.7320, 14.9210, 2.7685, 45.9550, 18.0700, 3.8155, 2.9446,
        46.1300, 18.1450, 2.9568])

Epoch 0019 | Training loss 10.473630 | Training R2 0.703023 | Validation loss 13.268398 | Validation R2 0.569962
Best loss 13.203379 | Best epoch 0018

100%##### 672/672 [01:37<00:00, 6.91it/s]
tensor([ 2.5559, 19.4985, 2.0311, 33.7559, 17.7553, 2.5439],
        grad_fn=IndexBackward0)
tensor([ 0.9807, 13.2440, 1.0495, 44.2920, 11.1530, 1.0742])

Epoch 0020 | Training loss 9.496670 | Training R2 0.755842 | Validation loss 10.343183 | Validation R2 0.738677
Best loss 10.343183 | Best epoch 0020

100%##### 672/672 [01:41<00:00, 6.61it/s]
tensor([ 6.5408, 27.2245, 21.7968, 17.0106, 14.4693, 9.1095, 26.0533, 19.8093,
        14.0560, 29.3762, 22.2869, 16.0390, 30.4309, 16.7102, 30.6311, 16.9595,
        30.6151, 17.0785, 30.7407, 17.0520, 30.7647, 16.8004, 30.8296, 16.6525,
        30.7940, 16.4034, 27.5907, 16.3012, 30.4290, 16.1035, 30.0555, 15.9718,
        29.7075, 15.7149, 29.5319, 15.9022, 15.8056, 26.1470, 15.8069, 28.9241,
        15.8869, 28.7300, 15.8038, 28.5423, 15.8702, 28.2471, 15.7892, 28.3078,
        15.8788, 28.1359, 23.1418], grad_fn=IndexBackward0)
tensor([13.4790, 18.0570, 13.0900, 10.7408, 8.5627, 4.6409, 22.6090, 10.6930,
        5.0463, 23.2430, 11.0050, 6.0091, 23.4230, 6.1265, 23.3150, 6.1035,
        23.4510, 6.1355, 23.4760, 6.1434, 23.1700, 6.0705, 23.2750, 6.0099,
        23.2050, 6.0940, 17.0110, 6.0951, 23.2930, 6.0960, 23.1390, 6.0082,
        23.1120, 6.0401, 23.1050, 6.0407, 6.0455, 17.4690, 6.0455, 23.1040,
        6.0462, 23.0900, 6.0454, 23.0970, 6.0451, 22.8050, 5.9719, 23.0900,
        6.0265, 22.6590, 13.4790])

Epoch 0021 | Training loss 7.951676 | Training R2 0.828823 | Validation loss 8.662682 | Validation R2 0.816695
Best loss 8.662682 | Best epoch 0021

100%##### 672/672 [01:46<00:00, 6.28it/s]
tensor([ 5.0714, 41.2239, 10.6933, 1.8153, -1.6648, 32.1178, 11.6598, 2.8483],
        grad_fn=IndexBackward0)
tensor([ 2.2700, 40.9940, 9.4533, 2.2722, 0.6695, 40.0030, 9.4476, 2.2708])

Epoch 0022 | Training loss 7.609004 | Training R2 0.843258 | Validation loss 8.749406 | Validation R2 0.813000
Best loss 8.662682 | Best epoch 0021

100%##### 672/672 [02:06<00:00, 5.32it/s]
tensor([ 7.4991, 41.7259, 10.5250, 2.0759, -0.8212, -0.1132],
        grad_fn=IndexBackward0)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724])

Epoch 0023 | Training loss 6.076002 | Training R2 0.872003 | Validation loss 6.008910 | Validation R2 0.806753
Best loss 6.008910 | Best epoch 0023

100%##### 672/672 [02:27<00:00, 4.57it/s]
tensor([10.0032, 11.7250, 3.9000, 25.9015, 11.5955, 4.2005, 24.3615, 10.3230,
        4.2500], grad_fn=IndexBackward0)
tensor([16.2540, 16.8150, 3.7307, 46.7120, 18.2510, 4.0494, 39.1610, 16.6090,
        4.1575])

Epoch 0024 | Training loss 6.344456 | Training R2 0.891027 | Validation loss 6.287634 | Validation R2 0.903429
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:32<00:00, 4.41it/s]
tensor([ 1.6094, 23.4610, 3.5930, -1.5090, -2.5777, 30.9283, 8.1172, 1.3945,
        -1.0457], grad_fn=IndexBackward0)
tensor([ 0.1465, 23.7240, 3.6020, 0.5996, 0.1266, 35.6020, 5.5209, 1.1669,
        0.1900])

Epoch 0025 | Training loss 7.193916 | Training R2 0.859093 | Validation loss 8.765650 | Validation R2 0.812311
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:33<00:00, 4.37it/s]
tensor([ 8.8472, 41.0249, 8.3407, 2.1899, 36.6626, 12.1595],
        grad_fn=IndexBackward0)
tensor([ 9.5449, 37.0970, 6.5141, 0.8206, 37.8140, 9.5449])

Epoch 0026 | Training loss 6.314091 | Training R2 0.892068 | Validation loss 7.142266 | Validation R2 0.875393
Best loss 6.287634 | Best epoch 0024

100%##### 672/672 [02:38<00:00, 4.24it/s]
tensor([ 8.5633, 52.2490, 1.5635, 17.5107, 1.9039, 16.5124, 1.4483],
        grad_fn=IndexBackward0)
tensor([ 5.0400, 57.3470, 1.4345, 18.1510, 1.4741, 17.6500, 1.4340])

Epoch 0027 | Training loss 6.055744 | Training R2 0.900719 | Validation loss 5.718650 | Validation R2 0.920116
Best loss 5.718650 | Best epoch 0027

100%##### 672/672 [02:39<00:00, 4.20it/s]
tensor([ 7.0700, 42.2500, 11.1524, 3.1023, 1.2074, 2.6037, 21.2056, 6.0037,
        3.4190], grad_fn=IndexBackward0)
tensor([ 7.2829, 42.8440, 12.3400, 4.1313, 1.6174, 1.6724, 20.9970, 5.9940,
        1.7166])

Epoch 0028 | Training loss 6.592818 | Training R2 0.882328 | Validation loss 7.770147 | Validation R2 0.852522
Best loss 5.718650 | Best epoch 0027

100%##### 672/672 [02:38<00:00, 4.23it/s]
tensor([ 3.7971, 35.3375, 8.4019, 1.6025, -0.3244, -0.0051, 13.2231, 2.0708,
        0.1261, 0.0945, 12.3040, 2.4095, 0.1007, 0.0419],
        grad_fn=IndexBackward0)
tensor([ 0.4160, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5000, 1.7944,
```

```
0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322])

Epoch 0029 | Training loss 5.998502 | Training R2 0.902587 | Validation loss 5.604497 | Validation R2 0.923274
Best loss 5.604497 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 4 --model 2 --save fold_4 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:31<00:00, 7.34it/s]
tensor([2.1999, 5.6524, 5.8410, 6.1936, 9.4860, 9.8432],
        grad_fn=IndexBackward0)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521])

Epoch 0001 | Training loss 24.587435 | Training R2 -0.636649 | Validation loss 29.936550 | Validation R2 -1.189140
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([ 4.9043,  9.9507,  9.0836,  9.2166,  9.3305, 13.3845, 13.5179, 13.6512,
        13.7654, 17.8186, 17.9522, 18.0858], grad_fn=IndexBackward0)
tensor([ 4.7756, 60.3880, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
        1.6243, 63.0070, 16.7090, 4.7756])

Epoch 0002 | Training loss 25.483650 | Training R2 -0.758136 | Validation loss 33.067993 | Validation R2 -1.671072
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.59it/s]
tensor([ 7.4014, 11.0031, 11.0204], grad_fn=IndexBackward0)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0003 | Training loss 24.522160 | Training R2 -0.627971 | Validation loss 32.016544 | Validation R2 -1.503911
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([ 7.3291, 19.1680, 10.0233, 9.8029], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0004 | Training loss 22.401255 | Training R2 -0.358544 | Validation loss 28.629280 | Validation R2 -1.002123
Best loss 28.629280 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([14.4074, 19.0099, 19.4276, 10.6136, 23.0021, 21.7756, 26.9901, 26.1410,
        24.3684, 28.5206, 26.5152], grad_fn=IndexBackward0)
tensor([20.1800, 76.4000, 23.3070, 3.2069, 20.8640, 3.3441, 78.0070, 24.2140,
        3.3317, 23.8640, 3.2836])

Epoch 0005 | Training loss 19.169922 | Training R2 0.005122 | Validation loss 21.290998 | Validation R2 -0.107291
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([12.2309, 18.9201, 18.0005, 16.3241, 20.7797, 18.8313, 22.8460, 20.6343,
        24.4405, 21.9717], grad_fn=IndexBackward0)
tensor([ 2.0389, 55.6560, 16.1950, 2.1895, 15.9180, 2.1521, 15.2060, 2.0559,
        15.0810, 2.0309])

Epoch 0006 | Training loss 19.678331 | Training R2 -0.048349 | Validation loss 22.492300 | Validation R2 -0.235770
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([ 9.0321, 16.7148, 15.5704, 14.4203], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2840, 2.9028])

Epoch 0007 | Training loss 18.438383 | Training R2 0.079604 | Validation loss 20.871935 | Validation R2 -0.064132
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:32<00:00, 7.23it/s]
tensor([ 0.2794,  0.7751,  0.5484, -0.3596, -1.0415, -1.9520, -2.6358, -3.3204,
        -2.3768, -4.0057, -5.6395], grad_fn=IndexBackward0)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164,
        1.2240, 0.2320])

Epoch 0008 | Training loss 20.370321 | Training R2 -0.123375 | Validation loss 23.957869 | Validation R2 -0.402059
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([17.7417, 27.3907, 25.9203], grad_fn=IndexBackward0)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0009 | Training loss 19.004763 | Training R2 0.013942 | Validation loss 21.900900 | Validation R2 -0.171647
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([17.3056, 25.6101, 24.2517, 20.7200, 26.5551, 24.9405, 21.0946, 26.8406,
        25.2540, 22.2393], grad_fn=IndexBackward0)
tensor([17.0830, 55.3190, 16.9070, 2.1271, 56.0470, 17.5230, 2.1942, 57.7130,
        17.7900, 2.2277])

Epoch 0010 | Training loss 17.059404 | Training R2 0.136499 | Validation loss 20.114540 | Validation R2 0.011697
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([ 8.7530, 19.0132, 16.0510, 16.2882, 22.7456, 19.5403, 19.2723],
        grad_fn=IndexBackward0)
tensor([ 9.2660, 25.5950, 5.0055, 3.7205, 26.2690, 4.4291, 3.8185])

Epoch 0011 | Training loss 18.237335 | Training R2 0.099566 | Validation loss 20.373814 | Validation R2 -0.013945
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:31<00:00, 7.34it/s]
tensor([ 9.9975, 15.6076, 13.4450, 11.2903, 17.1275, 15.1765, 11.2384],
        grad_fn=IndexBackward0)
tensor([14.9510, 17.0860, 6.4340, 2.7857, 51.9570, 17.6200, 2.0727])

Epoch 0012 | Training loss 17.548340 | Training R2 0.166316 | Validation loss 19.443098 | Validation R2 0.076577
Best loss 19.443098 | Best epoch 0012

100%##### 672/672 [01:30<00:00, 7.46it/s]
tensor([ 9.9177, 18.4395, 17.9721, 17.5216, 14.3823, 12.5939, 11.2551, 9.9186,
        16.4753, 13.0464], grad_fn=IndexBackward0)
tensor([ 4.1835, 35.5470, 29.2700, 24.3620, 6.9018, 3.3599, 1.9581, 1.1412,
        14.7460, 4.1835])

Epoch 0013 | Training loss 17.206947 | Training R2 0.198439 | Validation loss 19.141432 | Validation R2 0.105009
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([12.4364, 27.2505, 23.2604, 19.6116, 16.4929, 29.9086, 27.1892, 23.8359,
        20.2024], grad_fn=IndexBackward0)
tensor([ 4.7756, 60.3880, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
        1.6243])

Epoch 0014 | Training loss 17.306837 | Training R2 0.189105 | Validation loss 19.362793 | Validation R2 0.004189
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:31<00:00, 7.35it/s]
tensor([ 9.0598, 20.0499, 19.4907, 18.9320, 17.8166, 16.1479, 12.2752, 10.0752,
        8.9700, 18.0707, 14.2077, 10.3540, 6.0502, 18.4221, 14.3102, 10.7020,
        9.1701], grad_fn=IndexBackward0)
tensor([ 1.7205, 44.0430, 33.0500, 27.3170, 18.5670, 10.0030, 2.0810, 1.3604,
        0.9431, 27.6900, 6.1533, 1.6721, 0.9567, 23.0690, 6.2359, 1.6946,
        0.9695])

Epoch 0015 | Training loss 16.755896 | Training R2 0.239911 | Validation loss 19.031542 | Validation R2 0.115256
Best loss 19.031542 | Best epoch 0015

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([ 0.9582, 1.0900, 0.4565, -1.0290, -3.4424, -5.5529, 7.1404,
        -8.7240, -7.3052, -10.9310, -14.4209], grad_fn=IndexBackward0)
tensor([0.2320, 4.0372, 3.1668, 1.2218, 0.5990, 0.2316, 0.1136, 0.0557, 7.0164,
        1.2240, 0.2320])

Epoch 0016 | Training loss 16.645119 | Training R2 0.249928 | Validation loss 18.393700 | Validation R2 0.173566
Best loss 18.393700 | Best epoch 0016

100%##### 672/672 [01:34<00:00, 7.12it/s]
tensor([ 6.0242, 20.9003, 15.5757, 10.6441, 6.5071, 20.2602, 15.3091, 10.3295,
        6.0992, 19.2614, 16.2200, 12.1360, 8.0370], grad_fn=IndexBackward0)
tensor([ 1.6133, 40.1610, 12.3010, 4.1701, 1.6409, 41.0410, 12.7110, 4.2013,
        1.6846, 42.0210, 13.2660, 4.4600, 1.7581])

Epoch 0017 | Training loss 16.093096 | Training R2 0.208854 | Validation loss 17.970434 | Validation R2 0.211163
Best loss 17.970434 | Best epoch 0017

100%##### 672/672 [01:40<00:00, 6.60it/s]
tensor([12.0932, 35.1585, 29.2565, 17.6236, 35.2379, 31.1231, 21.2395],
        grad_fn=IndexBackward0)
tensor([ 3.0765, 62.3000, 16.2100, 1.3937, 63.5960, 16.5530, 1.4231])

Epoch 0018 | Training loss 15.311383 | Training R2 0.365315 | Validation loss 16.984724 | Validation R2 0.295328
Best loss 16.984724 | Best epoch 0018

100%##### 672/672 [01:50<00:00, 6.07it/s]
tensor([16.5482, 29.7475, 28.0376], grad_fn=IndexBackward0)
```

```
tensor([21.0100, 30.1650, 21.5660])

Epoch 0019 | Training loss 14.230635 | Training R2 0.451751 | Validation loss 15.854136 | Validation R2 0.386019
Best loss 15.854136 | Best epoch 0019

100%##### 672/672 [02:03<00:00, 5.43it/s]
tensor([19.7466, 42.1145, 30.3774, 41.1118, 17.0899, 25.5962, 11.4744, 34.7614,
        11.2551, 33.2510, 23.2312, 11.2077, 33.8895, 23.2144, 11.2046, 32.8959,
        23.1463, 11.2140, 32.9500, 23.3397, 11.3844, 32.9221, 23.4265, 11.5103,
        23.5826, 11.6663, 32.9210, 23.6521, 11.7840, 32.9144, 23.7639],
        grad_fn=IndexBackward0)
tensor([19.8480, 53.1050, 18.5150, 3.2922, 56.7650, 19.9680, 3.5506, 57.2050,
        3.5796, 56.8250, 19.9970, 3.5558, 56.0830, 19.9170, 3.5416, 56.1670,
        19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.8470, 3.5291,
        19.8520, 3.5380, 56.3440, 19.8300, 3.5261, 56.4480, 19.8400])

Epoch 0020 | Training loss 12.025496 | Training R2 0.608497 | Validation loss 13.721763 | Validation R2 0.540072
Best loss 13.721763 | Best epoch 0020

100%##### 672/672 [02:26<00:00, 4.59it/s]
tensor([11.1434, 49.1650, 25.8507, 12.7483], grad_fn=IndexBackward0)
tensor([ 0.4385, 64.0190, 18.8300, 2.4664])

Epoch 0021 | Training loss 12.230107 | Training R2 0.595061 | Validation loss 13.446256 | Validation R2 0.558356
Best loss 13.446256 | Best epoch 0021

100%##### 672/672 [02:45<00:00, 4.07it/s]
tensor([ 7.8498, 35.5636, 31.8140, 27.4297, 23.8189, 15.3497, 39.8910, 28.7233,
        18.5893, 41.4949, 30.8928, 19.8995, 41.8754, 38.6326, 20.1299, 38.6022,
        20.5340, 38.5935, 21.5521], grad_fn=IndexBackward0)
tensor([12.5700, 31.8440, 25.2520, 28.7650, 17.3800, 19.5840, 40.6700, 22.8730,
        13.9690, 43.5540, 24.6480, 15.0630, 44.0460, 35.6960, 15.2700, 35.8460,
        15.3380, 35.8950, 15.3590])

Epoch 0022 | Training loss 9.790716 | Training R2 0.740408 | Validation loss 12.751149 | Validation R2 0.602837
Best loss 12.751149 | Best epoch 0022

100%##### 672/672 [02:44<00:00, 4.09it/s]
tensor([14.1666, 61.5551, 29.6613, 8.8076, 58.5753, 24.2845, 8.8832],
        grad_fn=IndexBackward0)
tensor([ 6.2430, 65.0400, 25.1060, 4.2933, 69.2210, 23.5690, 4.5781])

Epoch 0023 | Training loss 8.497423 | Training R2 0.804519 | Validation loss 10.855521 | Validation R2 0.712147
Best loss 10.855521 | Best epoch 0023

100%##### 672/672 [02:50<00:00, 3.94it/s]
tensor([15.8495, 61.9667, 28.1483, 10.4488], grad_fn=IndexBackward0)
tensor([10.4370, 63.6710, 21.1850, 2.2930])

Epoch 0024 | Training loss 7.026572 | Training R2 0.866335 | Validation loss 7.219308 | Validation R2 0.872690
Best loss 7.219308 | Best epoch 0024

100%##### 672/672 [03:09<00:00, 3.56it/s]
tensor([15.0177, 53.2453, 22.2400, 13.1297, 52.0899, 24.2600],
        grad_fn=IndexBackward0)
tensor([20.1680, 53.7810, 19.0600, 3.5221, 56.3060, 20.1680])

Epoch 0025 | Training loss 22.096283 | Training R2 -0.321085 | Validation loss 31.622337 | Validation R2 -1.442631
Best loss 7.219308 | Best epoch 0024

100%##### 672/672 [03:06<00:00, 3.60it/s]
tensor([ 9.0573, 64.0458, 19.9370, 7.2607, 4.3328, 59.8810, 18.9035, 3.8537],
        grad_fn=IndexBackward0)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666])

Epoch 0026 | Training loss 6.403774 | Training R2 0.888900 | Validation loss 6.044273 | Validation R2 0.910760
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [03:06<00:00, 3.61it/s]
tensor([ 6.9223, 61.5160, 18.7082, 3.0362, 18.1905, 2.9401, 18.2441, 2.8033],
        grad_fn=IndexBackward0)
tensor([ 2.0309, 55.6560, 16.1050, 2.1095, 15.9180, 2.1521, 15.2060, 2.0559])

Epoch 0027 | Training loss 6.205529 | Training R2 0.895747 | Validation loss 6.115032 | Validation R2 0.908659
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [03:05<00:00, 3.62it/s]
tensor([ 6.4950, 60.9734, 50.3774, 41.8185, 20.7659, 16.2084, 8.8078, 3.7320,
        2.6390], grad_fn=IndexBackward0)
tensor([10.7920, 67.0230, 50.2480, 40.4590, 28.0060, 18.4230, 11.9080, 6.6646,
        4.3127])

Epoch 0028 | Training loss 6.350976 | Training R2 0.890528 | Validation loss 5.888662 | Validation R2 0.915296
Best loss 5.888662 | Best epoch 0028

100%##### 672/672 [03:03<00:00, 3.67it/s]
tensor([ 5.4355, 52.7556, 12.8180, 2.5391], grad_fn=IndexBackward0)
tensor([ 1.6420, 52.0970, 9.0003, 1.9523])

Epoch 0029 | Training loss 6.320073 | Training R2 0.891863 | Validation loss 5.790334 | Validation R2 0.910101
Best loss 5.790334 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 4 --model 3 --save fold 4 --lr 0.00005 --tol 1e-4 --epochs 30 --12 0.1
100%##### 672/672 [01:34<00:00, 7.08it/s]
tensor([ 2.8724, 6.5957, 6.0800, 6.9899, 7.2021, 10.7213, 10.9340, 11.3314,
        14.0272, 15.0422, 15.1036, 15.4413, 18.9374, 19.1537, 19.5554, 23.0516,
        23.2495, 23.6736, 27.3576, 27.6002, 27.7960, 30.7720, 30.9930, 31.2133],
        grad_fn=IndexBackward0)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666,
        61.4260, 21.0510, 16.6500, 3.9430, 61.0060, 21.6430, 3.9424, 61.4240,
        21.6460, 3.9429, 24.6850, 8.6517, 3.9430, 52.7130, 18.6400, 7.4356])

Epoch 0001 | Training loss 25.439190 | Training R2 -0.752008 | Validation loss 31.925747 | Validation R2 -1.489729
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:34<00:00, 7.11it/s]
tensor([ 3.2931, 6.3593, 6.3598, 6.3008, 5.4170, 5.4752, 7.2908, 7.3569,
        7.4149, 9.1766, 9.2347, 9.2928, 11.0515, 11.1676, 12.9117, 13.0278,
        14.7841, 14.9023, 16.6080, 16.7768, 18.5060, 18.6228, 20.3608, 20.4830,
        22.2271, 22.3433, 24.1067, 24.2035, 25.9470, 26.0630, 27.7936, 27.9099,
        29.6397, 29.7559, 31.4857, 31.6020, 33.4481, 35.1973, 35.2942, 37.0240,
        37.1403, 38.8701, 38.9864, 40.7162, 40.8325, 42.5338, 42.6501, 44.3000,
        44.4963, 46.1802, 46.2250], grad_fn=IndexBackward0)
tensor([13.4700, 18.0570, 13.0000, 18.7400, 8.5627, 4.6400, 22.6000, 10.6930,
        5.8463, 23.2430, 11.0050, 6.0691, 23.4230, 6.1265, 23.3150, 6.1035,
        23.4510, 6.1355, 23.4760, 6.1434, 23.1780, 6.0705, 23.2750, 6.0099,
        23.2050, 6.0940, 17.6110, 6.0951, 23.2930, 6.0960, 23.1390, 6.0502,
        23.1120, 6.0491, 23.1050, 6.0467, 6.0455, 17.4690, 6.0458, 23.1040,
        6.0462, 23.0900, 6.0454, 23.0970, 6.0451, 22.8050, 5.9719, 23.0390,
        6.0265, 22.6590, 13.4790])

Epoch 0002 | Training loss 26.376934 | Training R2 -0.883553 | Validation loss 34.834122 | Validation R2 -1.964010
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:34<00:00, 7.14it/s]
tensor([ 7.0250, 11.0704, 11.0709, 11.0814, 11.0873, 11.0917, 11.0975, 11.9019,
        11.9062, 15.7652, 15.7765, 15.7875], grad_fn=IndexBackward0)
tensor([ 2.0854, 42.8900, 34.5060, 27.9840, 22.2340, 6.5823, 2.8006, 1.5499,
        0.8339, 54.9410, 12.2540, 2.0854])

Epoch 0003 | Training loss 24.805020 | Training R2 -0.665852 | Validation loss 32.632805 | Validation R2 -1.601243
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.48it/s]
tensor([ 8.7386, 11.7069, 11.5418, 11.3754, 11.2797, 11.2316, 13.9237, 13.7084,
        13.6609, 13.6202, 16.3320, 16.2147, 16.1207, 16.0730],
        grad_fn=IndexBackward0)
tensor([ 5.1025, 48.9670, 16.1070, 6.3620, 6.6307, 2.7427, 18.1490, 6.0004,
        3.8009, 2.9318, 14.1770, 7.0320, 4.0131, 3.0316])

Epoch 0004 | Training loss 22.594074 | Training R2 -0.382033 | Validation loss 29.154833 | Validation R2 -1.076304
Best loss 29.154833 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.55it/s]
tensor([13.8576, 17.9291, 17.4015, 16.8603], grad_fn=IndexBackward0)
tensor([48.1440, 50.7900, 7.5206, 1.1600])

Epoch 0005 | Training loss 19.321512 | Training R2 -0.010675 | Validation loss 21.662233 | Validation R2 -0.146242
Best loss 21.662233 | Best epoch 0005

100%##### 672/672 [01:35<00:00, 7.05it/s]
tensor([11.5918, 16.2094, 16.0552], grad_fn=IndexBackward0)
tensor([21.0100, 30.1650, 21.5660])

Epoch 0006 | Training loss 18.006362 | Training R2 0.042500 | Validation loss 20.810762 | Validation R2 -0.057903
Best loss 20.810762 | Best epoch 0006

100%##### 672/672 [01:35<00:00, 7.06it/s]
tensor([13.7967, 24.9147, 23.5840, 22.4126, 21.0541, 27.8658, 26.2462, 23.2119],
        grad_fn=IndexBackward0)
```

```
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.8483, 61.8760, 21.7760, 3.9666])

Epoch 0007 | Training loss 10.582975 | Training R2 0.073144 | Validation loss 20.257120 | Validation R2 -0.002364
Best loss 20.257120 | Best epoch 0007

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([ 7.3947, 16.2076, 14.5821, 9.9615, 4.3722, -0.6687, 7.9056, 3.2674, -0.1207], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0008 | Training loss 17.884424 | Training R2 0.134077 | Validation loss 19.712755 | Validation R2 0.050785
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:30<00:00, 7.44it/s]
tensor([ 7.4039, 16.9333, 14.2522], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0009 | Training loss 18.018396 | Training R2 0.121056 | Validation loss 20.877218 | Validation R2 -0.064670
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([0.6249, 7.8101, 7.3241, 3.8194, 1.0698], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0010 | Training loss 17.464170 | Training R2 0.174295 | Validation loss 20.522924 | Validation R2 -0.028841
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([ 9.3226, 15.8665, 8.5315, 13.2728, 7.9733], grad_fn=<IndexBackward0>)
tensor([15.8300, 13.0430, 1.2600, 15.9120, 1.2850])

Epoch 0011 | Training loss 15.910845 | Training R2 0.316445 | Validation loss 18.198824 | Validation R2 0.190985
Best loss 18.198824 | Best epoch 0011

100%##### 672/672 [01:31<00:00, 7.32it/s]
tensor([ 4.3449, 16.5967], grad_fn=<IndexBackward0>)
tensor([ 2.4489, 16.6950])

Epoch 0012 | Training loss 15.860810 | Training R2 0.318949 | Validation loss 18.750023 | Validation R2 0.141237
Best loss 18.198824 | Best epoch 0011

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([ 8.7084, 25.3828, 17.3558, 9.8191, 3.7226, 1.3463, 10.4619, 6.1137, 2.9816, 10.1290, 7.5545, 4.8109, 4.4530], grad_fn=<IndexBackward0>)
tensor([ 7.2829, 42.8440, 3.3400, 4.1133, 1.6174, 1.6724, 20.9970, 5.9940, 1.7166, 17.7690, 5.9424, 1.9098, 1.7019])

Epoch 0013 | Training loss 13.904661 | Training R2 0.476500 | Validation loss 15.886096 | Validation R2 0.383479
Best loss 15.886096 | Best epoch 0013

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([ 7.0433, 27.5000, 16.8307, 7.2200, 0.1860, 9.9615, 3.3722, -0.6687, 7.9056, 3.2674, -0.1207], grad_fn=<IndexBackward0>)
tensor([ 1.7436, 45.8730, 13.5250, 4.4589, 1.7225, 16.4400, 5.4192, 1.7866, 10.0500, 5.2932, 1.7451])

Epoch 0014 | Training loss 12.929752 | Training R2 0.547405 | Validation loss 15.179044 | Validation R2 0.437194
Best loss 15.179044 | Best epoch 0014

100%##### 672/672 [01:34<00:00, 7.08it/s]
tensor([ 7.4332, 30.5729, 16.2396], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0015 | Training loss 12.240600 | Training R2 0.593035 | Validation loss 14.446182 | Validation R2 0.490228
Best loss 14.446182 | Best epoch 0015

100%##### 672/672 [01:34<00:00, 7.12it/s]
tensor([ 4.6836, 7.6900, 7.1004, 17.4322, 10.2643, 9.2034, 19.8746, 11.5507, 10.7448, 13.1053, 12.3932, 20.9605, 14.0527, 22.7131, 10.8298], grad_fn=<IndexBackward0>)
tensor([ 0.4665, 2.6600, 2.2691, 10.5760, 3.2225, 2.3435, 25.5770, 3.2261, 2.3462, 3.2262, 2.3463, 25.6730, 2.3549, 30.2890, 0.4665])

Epoch 0016 | Training loss 11.735577 | Training R2 0.627147 | Validation loss 14.173969 | Validation R2 0.509258
Best loss 14.173969 | Best epoch 0016

100%##### 672/672 [01:37<00:00, 6.86it/s]
tensor([11.6500, 60.2137, 25.1021, 10.0511], grad_fn=<IndexBackward0>)
tensor([ 5.7740, 65.1420, 19.1070, 6.7725])

Epoch 0017 | Training loss 10.962422 | Training R2 0.674656 | Validation loss 14.000322 | Validation R2 0.521209
Best loss 14.000322 | Best epoch 0017

100%##### 672/672 [01:43<00:00, 6.51it/s]
tensor([ 1.9511, 20.6097, 3.2096, -2.9083, -5.5950, 20.0863, 5.9632, -0.5994, -4.0749, 19.8153, -0.0704, -1.1292, -4.3055, 19.2795, 7.1646, 0.7701, -3.7093], grad_fn=<IndexBackward0>)
tensor([ 0.1465, 23.7240, 3.6020, 0.5996, 0.1266, 35.6020, 5.5209, 1.1669, 0.1900, 35.4800, 5.5170, 0.8985, 0.1096, 35.4800, 7.1499, 1.5090, 0.1096])

Epoch 0018 | Training loss 8.945731 | Training R2 0.783349 | Validation loss 10.094747 | Validation R2 0.751079
Best loss 10.094747 | Best epoch 0018

100%##### 672/672 [02:06<00:00, 5.32it/s]
tensor([10.3029, 63.2539, 20.8170, 1.5230, 1.4889, -0.0500, 4.2955, 35.4959, 16.3430, 3.1342, 16.7132, 12.0767, 3.3039, 2.6290], grad_fn=<IndexBackward0>)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4800, 19.8330, 2.0444, 57.7000, 16.2300, 1.6730, 44.0250, 12.3930, 1.0120, 1.2775])

Epoch 0019 | Training loss 8.820597 | Training R2 0.789368 | Validation loss 9.154214 | Validation R2 0.795303
Best loss 9.154214 | Best epoch 0019

100%##### 672/672 [02:21<00:00, 4.76it/s]
tensor([ 4.1644, 14.0120, -0.3130, 27.2210, 10.2752, -0.3314, 23.0703, 7.9699, -0.3345], grad_fn=<IndexBackward0>)
tensor([ 1.7265, 18.3160, 2.4943, 49.3870, 15.7100, 2.1405, 40.9940, 12.9500, 1.7635])

Epoch 0020 | Training loss 7.317793 | Training R2 0.855026 | Validation loss 7.885971 | Validation R2 0.840092
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:26<00:00, 4.59it/s]
tensor([ 0.4705, 47.7004, 13.9731, 1.0109, 41.2109, 11.3355, 1.4946, 40.8071, 13.6375, 2.4164, 39.6342, 12.4571, 3.1625], grad_fn=<IndexBackward0>)
tensor([ 2.9403, 47.9100, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370, 18.1500, 2.9979, 52.4090, 15.7600, 2.9900])

Epoch 0021 | Training loss 7.042254 | Training R2 0.865730 | Validation loss 8.384834 | Validation R2 0.828265
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:36<00:00, 4.29it/s]
tensor([ 4.4215, 36.0000, 0.1075, 0.6668, -1.3523, -1.4276, 11.2206, -0.1053, -1.0605, -1.9566, 9.4959, -0.7273, -2.5235, -2.5964, 0.4442, -2.1228, -3.3086, -3.3706], grad_fn=<IndexBackward0>)
tensor([ 0.4160, 30.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944, 0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7020, 1.6012, 0.4172, 0.3307])

Epoch 0022 | Training loss 9.585545 | Training R2 0.751250 | Validation loss 10.479062 | Validation R2 0.731724
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:37<00:00, 4.27it/s]
tensor([ 7.7273, 48.1425, 12.7922, 1.4126, 44.4121, 10.8110, 1.0509, 44.7639, 13.0078, 1.6967, 44.0300, 10.4309, 1.3453], grad_fn=<IndexBackward0>)
tensor([ 2.9403, 47.9100, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370, 18.1500, 2.9979, 52.4090, 15.7600, 2.9900])

Epoch 0023 | Training loss 6.300526 | Training R2 0.892531 | Validation loss 5.878633 | Validation R2 0.915584
Best loss 5.878633 | Best epoch 0023

100%##### 672/672 [02:38<00:00, 4.24it/s]
tensor([ 4.2403, 36.7011, 0.6615, 1.4000, -0.0500, -0.0907, 12.9539, 1.7627, 0.3970, 0.3455, 12.1303, 1.8436, 0.3857, 0.3445, 11.9547, 1.1000, 0.2205, 0.1000, 11.7720, 1.7016, 0.1001, 7.4648, 1.6911, 0.0025, 11.4607, 0.7494, -0.1201, -0.1730, 0.2474, -0.3031, 30.3601, 6.5045, 0.4006, -0.2833], grad_fn=<IndexBackward0>)
tensor([ 0.4160, 30.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944, 0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7020, 1.6012, 0.4172, 0.3307, 10.7700, 2.1100, 0.3304, 6.7693, 2.1100, 0.3304, 10.7810, 1.6011, 0.4171, 0.3307, 1.0556, 0.3304, 35.0000, 6.7693, 1.3316, 0.4160])

Epoch 0024 | Training loss 6.111111 | Training R2 0.890096 | Validation loss 5.600600 | Validation R2 0.921174
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:43<00:00, 4.12it/s]
tensor([ 0.8150, 11.5567, 4.6076, 11.2702, 5.0257, 6.5030, 5.3709, 11.5210, 5.0012, 11.6247, 5.0075, 11.7576, 6.1699, 12.0414, 6.4307, 12.2436], grad_fn=<IndexBackward0>)
tensor([14.5400, 14.3260, 2.1336, 15.1440, 2.2555, 7.1526, 2.2150, 14.6630, 2.1830, 14.4490, 2.1519, 14.3450, 2.1365, 14.4340, 2.1497, 14.5460])

Epoch 0025 | Training loss 6.472453 | Training R2 0.886506 | Validation loss 7.626001 | Validation R2 0.857940
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:50<00:00, 3.95it/s]
tensor([ 1.5432, 6.2264, 4.7043, 3.4637, 1.7140, 0.1073, -0.2402, -0.3312, -0.3259], grad_fn=<IndexBackward0>)
tensor([0.0492, 5.0725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4770, 0.1072, 0.0927])

Epoch 0026 | Training loss 6.022579 | Training R2 0.873004 | Validation loss 8.459002 | Validation R2 0.825177
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:51<00:00, 3.92it/s]
tensor([12.3260, 41.0040, 31.4630], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1650, 21.5600])

Epoch 0027 | Training loss 6.095839 | Training R2 0.899400 | Validation loss 6.096765 | Validation R2 0.883812
```

```
Best loss 5.688680 | Best epoch 0824

100%##### 672/672 [02:48<00:00, 3.98it/s]
tensor([ 3.3598, 38.0550, 32.1865, 26.7841, 11.2778,  5.3198,  1.1977, -0.6329,
         44.6388, 10.9635,  1.2176], grad_fn=IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5580, 17.5028,  6.4361,  3.0432,  1.1209,  0.2586,
         39.4790,  6.4477,  1.1231])

Epoch 0828 | Training loss 6.544991 | Training R2 0.884030 | Validation loss 6.196602 | Validation R2 0.906206
Best loss 5.688680 | Best epoch 0824

100%##### 672/672 [02:43<00:00, 4.10it/s]
tensor([ 5.3382, 57.8313, 14.6693,  3.2426,  1.1891, 15.5492,  4.6520,  2.3154,
         58.9284, 16.3887,  2.9409,  2.4515, 26.6236, 16.2949,  5.9094,  2.6612,
         20.1659,  6.1725,  3.0380, 20.9118,  6.8515,  3.4699],
        grad_fn=IndexBackward0>)
tensor([ 0.8310, 59.4470, 12.7970,  2.9511,  0.8392, 12.6360,  2.9139,  0.8286,
         58.9270, 12.7180,  1.5640,  0.8341, 56.6760, 12.2320,  3.4784,  0.8022,
         15.3490,  5.5396,  0.8163, 15.6260,  3.6834,  0.8310])

Epoch 0829 | Training loss 6.115859 | Training R2 0.898765 | Validation loss 7.040408 | Validation R2 0.878922
Best loss 5.688680 | Best epoch 0824

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/F5fold_models/Neural-ODE/run_train.py --fold 4 --model 4 --save fold_4 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:33<00:00, 7.19it/s]
tensor([ 2.8993,  4.3683,  4.5242,  4.8280,  6.9284,  7.1381,  7.3631,  9.4930,
         9.6565,  9.9135, 12.0199, 12.2073, 12.4649], grad_fn=IndexBackward0>)
tensor([ 7.1280, 48.3090, 16.0790,  2.5997, 40.2000, 10.9370,  2.6928, 34.4200,
         12.7210,  2.7225, 40.6640, 12.7280,  2.7241])

Epoch 0801 | Training loss 24.240671 | Training R2 -0.590810 | Validation loss 29.148003 | Validation R2 -1.075331
Best loss 29.148003 | Best epoch 0801

100%##### 672/672 [01:32<00:00, 7.26it/s]
tensor([4.3878, 7.2371, 7.3457], grad_fn=IndexBackward0>)
tensor([15.2960, 46.2360, 13.6630])

Epoch 0802 | Training loss 25.267263 | Training R2 -0.728405 | Validation loss 32.724815 | Validation R2 -1.615919
Best loss 29.148003 | Best epoch 0801

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([ 5.5793,  9.6449,  0.5271,  0.6107,  0.5905, 11.4704, 11.4660, 11.4518],
        grad_fn=IndexBackward0>)
tensor([ 1.4091, 45.1660,  6.8944,  1.3910,  0.4434, 45.6640,  8.7781,  1.4091])

Epoch 0803 | Training loss 24.392866 | Training R2 -0.610849 | Validation loss 31.869343 | Validation R2 -1.480939
Best loss 29.148003 | Best epoch 0801

100%##### 672/672 [01:33<00:00, 7.22it/s]
tensor([ 5.8613, 10.4141, 10.1005,  9.9754], grad_fn=IndexBackward0>)
tensor([ 5.8484, 17.8220,  6.0592,  2.8044])

Epoch 0804 | Training loss 20.007446 | Training R2 -0.083708 | Validation loss 23.670774 | Validation R2 -0.368658
Best loss 23.670774 | Best epoch 0804

100%##### 672/672 [01:30<00:00, 7.44it/s]
tensor([10.7725, 17.4414, 16.9693, 15.8382, 21.2687, 19.7636, 24.7900, 23.0000,
        27.9219, 25.9787], grad_fn=IndexBackward0>)
tensor([ 2.8309, 55.6500,  2.1950,  2.1095, 15.9180,  2.1521, 15.2060,  2.0559,
        15.0810,  2.0309])

Epoch 0805 | Training loss 19.205890 | Training R2 0.061384 | Validation loss 22.241131 | Validation R2 -0.208325
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([13.6329, 20.3223, 19.5656, 17.8163, 23.6840, 22.6161, 20.0065, 26.5826,
        25.2495, 23.9893, 22.9834], grad_fn=IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710,  3.1501, 62.0600, 19.0200,  3.2978, 62.7360,
        19.2460,  7.4859,  3.3370])

Epoch 0806 | Training loss 20.557449 | Training R2 -0.144109 | Validation loss 24.015671 | Validation R2 -0.408832
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:33<00:00, 7.17it/s]
tensor([16.9284, 21.0471, 20.9410, 20.8352, 20.7271, 20.3929, 23.0760, 23.4270,
        22.9282, 26.1789, 25.6084, 25.1570, 28.0600, 27.3327, 30.1612, 29.3570,
        32.1722, 31.3065, 34.1266, 33.1905, 35.9462, 36.9561, 37.6573, 36.6051,
        39.2385, 38.1246, 40.6862, 39.5110, 42.0308, 40.7943],
        grad_fn=IndexBackward0>)
tensor([38.1730, 32.4920, 24.8400, 20.1090, 16.9610, 11.5390, 42.3070, 24.3350,
        16.9860, 47.3100, 27.9650, 19.6630, 34.2530, 20.9790, 35.0450, 21.5240,
        35.5990, 21.8790, 36.1540, 22.2220, 36.2560, 22.3030, 36.3190, 22.3450,
        36.2250, 22.2940, 36.0400, 22.1840, 35.9840, 22.1450])

Epoch 0807 | Training loss 20.864714 | Training R2 -0.178566 | Validation loss 24.533953 | Validation R2 -0.478297
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([13.5987, 17.2932, 17.1564, 17.0169], grad_fn=IndexBackward0>)
tensor([31.1600, 21.5030, 17.4770, 14.5630])

Epoch 0808 | Training loss 20.585428 | Training R2 -0.147226 | Validation loss 24.066521 | Validation R2 -0.414805
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([ 9.4386, 16.3450, 14.2150, 11.4437, 16.6823, 15.0743],
        grad_fn=IndexBackward0>)
tensor([ 9.5449, 37.6970,  6.5141,  0.8206, 37.8140,  9.5449])

Epoch 0809 | Training loss 19.902319 | Training R2 -0.072350 | Validation loss 23.161474 | Validation R2 -0.310395
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:30<00:00, 7.42it/s]
tensor([ 5.5932, 12.3538, 12.0206, 11.6848, 10.3945,  9.4810,  8.2765,  7.3738],
        grad_fn=IndexBackward0>)
tensor([ 1.0703, 24.1700, 18.6400, 14.5690,  5.5683,  2.7131,  1.0403,  0.5869])

Epoch 0810 | Training loss 19.259192 | Training R2 -0.004165 | Validation loss 22.403614 | Validation R2 -0.226044
Best loss 22.241131 | Best epoch 0805

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([ 7.3921, 15.4699, 12.9607, 10.8167,  8.3234, 16.6326, 13.7860, 10.9830,
        0.6877, 16.5475, 14.0182, 11.2736,  0.7886, 15.5458, 13.3381, 10.9156,
        0.5400, 13.5204, 12.2540,  9.8752,  7.6965, 12.9970, 10.7930,  0.5555,
        6.4607, 11.1752,  9.0147,  5.6914,  4.6343,  6.9687,  4.7241,  2.6200,
        7.4725,  0.9743,  5.9411,  3.7118, -0.5238,  1.9366,  0.0317, -2.3644,
        -0.0617, -2.3752, -4.5300, -0.0170, -2.3210, -4.7410, -7.4294],
        grad_fn=IndexBackward0>)
tensor([ 0.7450, 40.8200,  9.9731,  3.1421,  0.8166, 40.8800, 10.0110,  2.6018,
        0.6197, 40.8630, 10.0090,  2.6011,  0.8195, 39.2230,  9.6072,  2.4960,
        0.7866, 20.7500,  9.6001,  2.4950,  0.7861, 39.1050,  9.6000,  2.4949,
        0.7861, 37.7600,  9.2488,  1.3492,  0.7573,  9.2427,  2.4021,  0.7568,
        42.0710,  0.8422, 45.0040, 11.0200,  0.9023, 11.0300,  3.4749,  0.9031,
        11.0300,  2.8665,  0.9031, 45.0330, 11.0300,  2.8665,  0.7450])

Epoch 0811 | Training loss 18.370600 | Training R2 0.086359 | Validation loss 20.881422 | Validation R2 -0.065099
Best loss 20.881422 | Best epoch 0811

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([ 6.5070, 11.4671, 7.1559, 11.7921,  9.5270,  7.0330, 11.2793,  9.2502,
        6.8160, 10.6249,  2.9077,  6.4109, 10.4517,  8.3311,  5.9003,  3.3900,
        5.0892,  0.5680,  6.4435,  3.8118,  7.4316,  5.2236,  2.4744,  6.0502,
        4.0339,  2.3123,  0.8004,  4.4167,  2.0192, -0.9629,  0.0474, -3.0528,
        -1.1970, -3.4509], grad_fn=IndexBackward0>)
tensor([ 7.5182, 15.6800,  3.1867, 27.9940, 10.3060,  3.4217, 32.5420, 11.7100,
        3.4396, 32.5520, 13.2420,  3.4408, 40.3530, 12.2300,  3.5924, 29.4830,
        3.0040, 32.6600, 11.7570,  3.4535, 34.0010, 12.2340,  3.5934, 34.0970,
        13.0700,  6.4407,  3.6041, 36.1050, 12.2750,  3.6049, 12.2740,  3.6054,
        17.7370,  7.5182])

Epoch 0812 | Training loss 17.796364 | Training R2 0.142584 | Validation loss 20.198370 | Validation R2 0.003442
Best loss 20.198370 | Best epoch 0812

100%##### 672/672 [01:29<00:00, 7.49it/s]
tensor([18.1552, 22.1167, 18.2234, 23.1250, 20.6723, 16.5251, 21.2824, 18.8539,
        15.0051, 19.8181, 17.8533, 15.0033, 19.0660, 17.3397, 14.4262, 18.4159],
        grad_fn=IndexBackward0>)
tensor([46.6430, 16.5660,  2.9042, 47.5600, 16.8100,  3.0078, 47.1240, 16.6500,
        2.9791, 47.5720, 16.8140,  3.0085, 47.0390, 16.6260,  2.9749, 46.6430])

Epoch 0813 | Training loss 17.672243 | Training R2 0.154502 | Validation loss 20.135670 | Validation R2 0.009620
Best loss 20.135670 | Best epoch 0813

100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([15.7235, 21.9340, 21.4483, 20.9525, 19.3949, 21.5689, 25.2046, 23.9585,
        22.7006, 25.1933, 23.5000, 25.3662, 24.0580, 26.2581, 24.4513, 26.5790,
        24.7060, 27.2621, 24.0573, 26.0676, 25.2004], grad_fn=IndexBackward0>)
tensor([20.9330, 26.7620, 22.9070, 19.9020, 13.0070, 17.6410, 46.0300, 29.5720,
        19.3340, 35.0900, 20.3400, 31.7000, 20.7250, 36.0800, 20.8550, 36.0910,
        20.9040, 42.0090, 20.9210, 36.9340, 20.9200])
```

Epoch 0014 | Training loss 16.964031 | Training R2 0.220911 | Validation loss 19.311337 | Validation R2 0.080950
Best loss 19.311337 | Best epoch 0014

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([17.8863, 37.3666, 32.3489, 23.9999, 39.5029, 35.9349, 28.6494, 38.7055,
35.1126, 28.4081, 37.0100, 33.2479, 29.0002, 30.2650, 36.5677, 31.0493,
37.3955, 35.5460, 32.0257, 38.4204, 36.4113, 32.7683],
grad_fn=IndexBackward0>)
tensor([6.5237, 74.1600, 27.2770, 6.8609, 78.2140, 29.7730, 6.4850, 78.5910,
29.9390, 6.5212, 78.6230, 29.9530, 6.5243, 6.5245, 63.0610, 6.4075,
64.1270, 29.9070, 6.5146, 78.6170, 29.9510, 6.5237])

Epoch 0015 | Training loss 16.071217 | Training R2 0.300759 | Validation loss 18.356150 | Validation R2 0.176937
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:38<00:00, 7.40it/s]
tensor([16.5277, 44.4044, 39.2769, 27.7244, 45.6794, 40.7189, 32.3551, 44.8518,
38.4719, 30.6690], grad_fn=IndexBackward0>)
tensor([3.5346, 75.5620, 25.2660, 3.8933, 65.0520, 23.0200, 4.0963, 64.9580,
19.9220, 4.0935])

Epoch 0016 | Training loss 16.231964 | Training R2 0.286701 | Validation loss 18.394156 | Validation R2 0.173525
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:31<00:00, 7.37it/s]
tensor([5.3319, 17.4150, 16.5360, 15.6327, 11.7102, 8.7342, 5.1355, 2.4899],
grad_fn=IndexBackward0>)
tensor([1.0703, 24.1700, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0017 | Training loss 16.121244 | Training R2 0.296399 | Validation loss 18.390121 | Validation R2 0.173088
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:32<00:00, 7.25it/s]
tensor([8.2026, 28.0302, 26.6790, 23.8754, 20.0850, 16.5093, 11.9295, 8.6301,
5.4420, 24.6861, 16.0909, 8.5960, 4.5533, 18.9753, 15.0632, 9.7732,
6.4840], grad_fn=IndexBackward0>)
tensor([4.0844, 39.7300, 31.0010, 22.1240, 13.5590, 8.3876, 4.4262, 2.7406,
1.6970, 51.6670, 13.3870, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
1.7089])

Epoch 0018 | Training loss 13.867579 | Training R2 0.479369 | Validation loss 15.791674 | Validation R2 0.390847
Best loss 15.791674 | Best epoch 0018

100%##### 672/672 [01:38<00:00, 6.84it/s]
tensor([6.1014e+00, 2.5528e+01, 1.4262e+01, 5.9708e+00, -2.2717e+00,
1.6085e+01, 6.1398e+00, 3.2727e-01, -3.4941e+00, 1.1665e+01,
5.4933e+00, 3.5902e-01, -3.4109e+00, 1.1020e+01, 5.0516e+00,
7.2515e-04, -3.6842e+00], grad_fn=IndexBackward0>)
tensor([0.7450, 40.0200, 9.9731, 3.1421, 0.0166, 40.8800, 10.0110, 2.6018,
0.0197, 40.0630, 10.0090, 2.6011, 0.0195, 39.2230, 9.0072, 2.4908,
0.7866])

Epoch 0019 | Training loss 12.710710 | Training R2 0.562610 | Validation loss 14.843241 | Validation R2 0.461820
Best loss 14.843241 | Best epoch 0019

100%##### 672/672 [01:46<00:00, 6.32it/s]
tensor([10.6566, 46.4087, 26.5691, 10.1913, 2.7001, 35.4057, 14.4463, 7.3089,
1.1632], grad_fn=IndexBackward0>)
tensor([4.6511, 55.9000, 16.9540, 4.6038, 2.0962, 47.9720, 12.9760, 5.0075,
2.2130])

Epoch 0020 | Training loss 11.812094 | Training R2 0.622269 | Validation loss 13.195599 | Validation R2 0.574668
Best loss 13.195599 | Best epoch 0020

100%##### 672/672 [02:00<00:00, 5.60it/s]
tensor([10.1553, 18.2907, 5.9339, 0.7742, 24.4130, 11.2959, 0.2082, 10.9734,
0.3400, 22.0324, 0.4522, 4.2067, 0.0211, 23.1974, 5.1732, 1.2610,
0.0361, 8.2529, 1.1520, 23.7739, 4.9145, 1.9538, 1.5326, 9.5860],
grad_fn=IndexBackward0>)
tensor([14.9510, 17.0060, 6.4340, 2.7857, 51.9570, 17.6200, 0.8727, 17.5920,
2.0601, 53.1470, 9.9466, 6.7516, 2.9232, 63.6570, 7.9009, 3.4208,
2.9753, 11.9150, 2.9524, 53.4760, 6.8475, 3.4006, 2.9648, 14.9510])

Epoch 0021 | Training loss 10.502948 | Training R2 0.701358 | Validation loss 11.709469 | Validation R2 0.665077
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:23<00:00, 4.67it/s]
tensor([4.8642, 17.7674, 3.7490, -0.9090], grad_fn=IndexBackward0>)
tensor([5.0484, 17.0220, 6.0592, 2.0044])

Epoch 0022 | Training loss 9.577409 | Training R2 0.751672 | Validation loss 12.240973 | Validation R2 0.633903
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:37<00:00, 4.26it/s]
tensor([10.1105, 54.1474, 47.1999, 40.6521, 34.9629, 18.5855, 10.9807, 5.3792,
3.3080], grad_fn=IndexBackward0>)
tensor([12.0510, 55.0900, 40.4200, 31.6600, 25.7020, 12.4200, 7.3585, 3.6646,
2.1727])

Epoch 0023 | Training loss 7.726095 | Training R2 0.838364 | Validation loss 9.112268 | Validation R2 0.797174
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:34<00:00, 4.35it/s]
tensor([6.9040, 41.2925, 23.4426, 12.2643, 5.9100, 1.2359, -0.0414,
-0.5204, 30.4061, 9.3305, -0.1065, -1.4874, 31.3701, 6.5204, -1.4669,
-2.4291, 13.1051, -1.7246, -3.2997], grad_fn=IndexBackward0>)
tensor([4.0044, 39.7300, 31.0010, 22.1240, 13.5590, 8.3876, 4.4262, 2.7406,
1.6970, 51.6670, 13.3870, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
1.7089, 18.7290, 4.4247, 1.6964])

Epoch 0024 | Training loss 9.422968 | Training R2 0.759617 | Validation loss 9.542447 | Validation R2 0.777572
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:47<00:00, 4.02it/s]
tensor([23.6239, 67.3576, 30.3424, 17.5067, 53.2716, 29.3855, 18.0101, 57.4094,
31.0669, 19.9989, 59.0965], grad_fn=IndexBackward0>)
tensor([42.1750, 56.1960, 7.7054, 0.4302, 32.9930, 7.7374, 0.4275, 41.1230,
7.5177, 0.4154, 42.1750])

Epoch 0025 | Training loss 7.962917 | Training R2 0.828338 | Validation loss 9.609060 | Validation R2 0.774418
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [03:03<00:00, 3.66it/s]
tensor([4.0900, 45.6167, 9.5907, 0.1051, -0.9369, 39.9992, 0.5700,
-0.3131, -1.5515, 39.4073, 9.3195, -0.3092, -2.4004, 37.1201,
0.0991, -0.9200, -3.5922, 35.0006, 8.4308, -1.9218, -4.8642,
33.2721, 7.7279, -3.1406, -6.2217, 31.0621, 6.4007, -4.3224,
-7.6073, 29.4215, 4.9050, -5.7174, -0.7939, 20.9204, 4.0274,
-6.7392, -9.6000, 7.2845, -6.6397, -10.4594, 26.3305, 1.3159,
-8.2640, -11.1100, 24.3990, -0.4301, -9.1098, -11.8479, 21.2692,
-2.0100, -9.9000, -12.4354, 10.3305, -3.3304, -13.0076, -4.3371,
-11.5602, -13.0299, 17.7920, -14.3070, -9.9450, -12.6202, -15.1504],
grad_fn=IndexBackward0>)
tensor([1.6133, 40.1610, 12.3010, 4.1701, 1.6409, 41.0410, 12.7110, 4.2013,
1.6046, 42.0210, 13.2600, 4.4600, 1.7501, 41.6500, 12.9000, 3.6070,
1.7105, 41.2450, 12.7000, 4.3043, 1.6937, 39.8740, 12.3490, 4.1591,
1.6366, 39.6830, 12.2000, 4.1380, 1.6205, 38.6090, 11.9000, 4.0377,
1.5000, 39.3970, 12.2070, 4.1090, 1.6171, 16.2000, 4.6939, 1.5010,
39.7140, 12.3040, 4.1439, 1.6300, 39.4100, 12.7100, 4.1124, 6.182,
37.9910, 11.7700, 3.9642, 1.5500, 36.4990, 11.3100, 1.4900, 11.3470,
3.0219, 1.5030, 39.1100, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0026 | Training loss 8.169349 | Training R2 0.819323 | Validation loss 8.430163 | Validation R2 0.826400
Best loss 8.430163 | Best epoch 0026

100%##### 672/672 [03:01<00:00, 3.71it/s]
tensor([6.5499, 40.5903, 15.1371, 3.5329], grad_fn=IndexBackward0>)
tensor([2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0027 | Training loss 6.078400 | Training R2 0.871910 | Validation loss 7.949504 | Validation R2 0.845635
Best loss 7.949504 | Best epoch 0027

100%##### 672/672 [02:58<00:00, 3.77it/s]
tensor([22.4053, 65.2000, 29.7620, 19.7173, 17.9701, 57.3077, 20.7129, 17.0100,
15.9415, 26.9971, 14.9020, 63.2690, 30.2553, 16.0464, 63.0235, 30.3975,
16.6662, 63.3403], grad_fn=IndexBackward0>)
tensor([54.4230, 51.9620, 17.0410, 7.0369, 43.0090, 17.6270, 3.0059,
2.5940, 15.3400, 2.6174, 55.5000, 18.3240, 2.6966, 55.2450, 18.2160,
2.6006, 54.4230])

Epoch 0028 | Training loss 6.115299 | Training R2 0.890757 | Validation loss 5.728622 | Validation R2 0.919030
Best loss 5.728622 | Best epoch 0028

100%##### 672/672 [02:53<00:00, 3.86it/s]
tensor([9.6401, 86.3610, 29.5400, 5.6376, 70.3233, 26.1667, 6.2007, 70.0224,
24.1507, 6.6242], grad_fn=IndexBackward0>)
tensor([3.5346, 75.5620, 25.2660, 3.8933, 65.0520, 23.0200, 4.0963, 64.9580,
19.9220, 4.0935])

Epoch 0029 | Training loss 6.373670 | Training R2 0.890021 | Validation loss 7.142794 | Validation R2 0.875375
Best loss 5.728622 | Best epoch 0028

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead


```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/Neural-ODE/run_train.py --fold 4 --model 5 --save fold_4 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:31:00:00, 7.32it/s]
tensor([2.4257, 5.2958, 5.4951], grad_fn=IndexBackward0)
tensor([16.0320, 54.3750, 13.4380])

Epoch 0001 | Training loss 25.501337 | Training R2 -0.760577 | Validation loss 32.142315 | Validation R2 -1.523621
Best loss 32.142315 | Best epoch 0001

100%##### 672/672 [01:31:00:00, 7.32it/s]
tensor([10.9780, 16.4282, 16.4284, 16.4305, 16.4447, 16.4853, 16.5342, 16.5586,
        16.5330, 21.8501, 21.9070, 21.9440, 22.0047], grad_fn=IndexBackward0)
tensor([ 1.7195, 93.2850, 73.9470, 62.0350, 53.2360, 26.3850, 11.4810, 7.5733,
        4.9958, 75.1950, 26.9070, 10.1920, 5.0947])

Epoch 0002 | Training loss 25.554596 | Training R2 -0.767938 | Validation loss 33.443009 | Validation R2 -1.732012
Best loss 32.142315 | Best epoch 0001

100%##### 672/672 [01:35:00:00, 7.00it/s]
tensor([ 7.0450, 10.0154, 10.0010, 9.9866], grad_fn=IndexBackward0)
tensor([21.4040, 31.6970, 25.8410, 21.4048])

Epoch 0003 | Training loss 24.312588 | Training R2 -0.600264 | Validation loss 32.060600 | Validation R2 -1.512059
Best loss 32.060600 | Best epoch 0003

100%##### 672/672 [01:33:00:00, 7.22it/s]
tensor([ 4.0094, 7.7182, 7.1797, 6.7086, 10.2464, 8.3896, 11.8718, 9.6665,
        13.0053, 10.4877, 11.8137, 10.9202, 11.9681], grad_fn=IndexBackward0)
tensor([ 2.5158, 10.0050, 2.5192, 0.8070, 40.4740, 0.8047, 40.4720, 0.8047,
        39.6060, 0.7875, 2.5158, 0.7872, 2.5158])

Epoch 0004 | Training loss 10.267012 | Training R2 0.096633 | Validation loss 19.870958 | Validation R2 0.035488
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:33:00:00, 7.22it/s]
tensor([ 4.8690, 9.7944, 7.7088, 13.1650, 11.7143], grad_fn=IndexBackward0)
tensor([12.8470, 12.6880, 1.0025, 53.5960, 12.8470])

Epoch 0005 | Training loss 10.761860 | Training R2 0.047026 | Validation loss 21.200550 | Validation R2 -0.097903
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:30:00:00, 7.41it/s]
tensor([21.4091, 34.6569, 32.5763], grad_fn=IndexBackward0)
tensor([19.2920, 85.6310, 19.2920])

Epoch 0006 | Training loss 17.982162 | Training R2 0.124587 | Validation loss 20.414364 | Validation R2 -0.017986
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:31:00:00, 7.38it/s]
tensor([18.8590, 29.9787, 27.4882], grad_fn=IndexBackward0)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0007 | Training loss 16.927532 | Training R2 0.224260 | Validation loss 19.159618 | Validation R2 0.183307
Best loss 19.159618 | Best epoch 0007

100%##### 672/672 [01:30:00:00, 7.39it/s]
tensor([17.9655, 34.3182, 30.5375, 23.3251, 34.3692, 29.5117, 18.7665, 22.5827,
        16.5382, 13.3714, 16.2217, 13.3985, 11.9360, 14.2540, 12.4377, 11.5434,
        13.4044, 12.0542], grad_fn=IndexBackward0)
tensor([ 7.2463, 70.9430, 22.7700, 3.3003, 60.2640, 24.0900, 3.4903, 24.0210,
        8.4087, 3.4804, 20.9620, 7.4078, 3.5230, 20.0010, 7.3509, 3.4968,
        20.5050, 7.2463])

Epoch 0008 | Training loss 16.370752 | Training R2 0.274452 | Validation loss 18.973333 | Validation R2 0.120659
Best loss 18.973333 | Best epoch 0008

100%##### 672/672 [01:32:00:00, 7.27it/s]
tensor([12.1032, 24.9040, 20.8033, 13.0126, 22.6410, 17.7574, 9.1740, 8.4137,
        14.9725, 11.3985, 7.3387, 11.5202, 9.2640, 7.5464, 10.3042, 9.3327,
        7.9904, 10.2717, 9.5509, 8.7520, 10.6169, 10.2095, 9.4622, 11.3097,
        10.8502, 10.0053, 11.4501, 10.8654, 10.3499, 11.8080, 11.2397, 10.5846,
        11.9419, 10.5950, 11.9133, 11.2209, 10.4416, 11.6993, 10.9565, 10.1020,
        11.3339, 10.1421], grad_fn=IndexBackward0)
tensor([ 7.3680, 43.7320, 14.9210, 2.7685, 45.9550, 18.0700, 3.8155, 2.9446,
        46.1300, 18.1450, 2.9560, 46.7250, 14.1700, 2.9953, 45.9950, 15.9060,
        2.9515, 45.8260, 46.7550, 2.9235, 46.3120, 16.0030, 2.9695, 46.4300,
        16.0330, 2.9750, 20.4610, 7.2470, 2.9262, 21.0770, 8.4900, 3.0144,
        20.5900, 2.9440, 20.6570, 8.3285, 2.9543, 20.5540, 8.2870, 2.9396,
        20.0050, 7.3680])

Epoch 0009 | Training loss 14.815959 | Training R2 0.405723 | Validation loss 16.785484 | Validation R2 0.311764
Best loss 16.785484 | Best epoch 0009

100%##### 672/672 [01:31:00:00, 7.35it/s]
tensor([15.2201, 37.9792, 30.4121, 22.7532, 16.1195, 34.4087, 22.6515],
        grad_fn=IndexBackward0)
tensor([15.8620, 56.9500, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0010 | Training loss 14.673149 | Training R2 0.417125 | Validation loss 16.793373 | Validation R2 0.311117
Best loss 16.785484 | Best epoch 0009

100%##### 672/672 [01:31:00:00, 7.38it/s]
tensor([12.6404, 24.5527, 9.3701, 16.1193, 8.5453, 10.2315, 13.3730, 8.7617],
        grad_fn=IndexBackward0)
tensor([23.5920, 20.2570, 2.7573, 21.0300, 2.8637, 70.1770, 21.0260, 2.8620])

Epoch 0011 | Training loss 13.782256 | Training R2 0.405755 | Validation loss 15.996996 | Validation R2 0.374904
Best loss 15.996996 | Best epoch 0011

100%##### 672/672 [01:33:00:00, 7.16it/s]
tensor([ 4.0990, 27.0276, 26.2090, 24.5929, 18.1533, 13.3494, 7.2182, 3.3014,
        21.8690, 13.4942, 8.6037], grad_fn=IndexBackward0)
tensor([ 0.4137, 29.3630, 22.5500, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
        39.4700, 6.4477, 1.1211])

Epoch 0012 | Training loss 13.303940 | Training R2 0.520829 | Validation loss 15.555521 | Validation R2 0.408930
Best loss 15.555521 | Best epoch 0012

100%##### 672/672 [01:32:00:00, 7.27it/s]
tensor([ 9.7279, 32.9579, 31.1275, 27.5726, 10.4900, 15.2696, 8.3477, 2.3601,
        19.6307, 10.3360, 5.2515, 2.0294, 14.1004, 8.3174, 4.3076, 1.9895,
        11.4774, 8.7051, 4.2783, 3.9683, 10.1290, 7.9004, 6.9519, 5.0924,
        11.1614, 9.0574, 8.5018, 7.2632, 12.1099, 10.6000, 9.4540, 8.2704,
        12.4400, 11.3100, 9.9475, 8.7501, 12.0870, 11.5066],
        grad_fn=IndexBackward0)
tensor([12.5050, 42.0500, 34.0410, 24.5230, 12.4040, 7.4420, 3.7669, 1.3563,
        42.1990, 12.2400, 3.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3305,
        43.0630, 20.0330, 1.9210, 1.3667, 43.0660, 8.0969, 3.7979, 1.3674,
        42.5300, 12.3470, 3.7496, 1.3500, 42.9850, 10.5230, 3.7800, 1.3642,
        43.0840, 12.5050, 3.7977, 1.3674, 43.0840, 12.5050])

Epoch 0013 | Training loss 13.012312 | Training R2 0.541607 | Validation loss 15.213002 | Validation R2 0.434613
Best loss 15.213002 | Best epoch 0013

100%##### 672/672 [01:33:00:00, 7.21it/s]
tensor([ 0.2745, 10.0347, 2.2603, -0.2056, -0.6719, 8.2394, 3.7114, 1.4406,
        1.0090, 0.3221, 2.2300, 2.6109, 2.3726, 7.1274, 5.6220, 4.6610,
        4.6609, 0.3041, 7.0924, 5.9960, 5.8123, 9.2077, 7.0543, 6.7494,
        10.1614, 0.6661, 7.3550, 10.6007, 8.6601, 7.7160, 10.9804, 9.1611,
        7.9981, 11.2231, 9.1500, 8.1591, 11.2712, 9.3742],
        grad_fn=IndexBackward0)
tensor([ 5.3290, 14.0900, 5.0763, 2.4483, 2.1161, 14.7070, 5.2903, 2.5554,
        2.2086, 14.9430, 5.3034, 2.5964, 2.2441, 12.6700, 5.2850, 2.5490,
        2.2031, 16.0000, 5.9015, 2.4934, 2.1551, 16.9430, 5.2750, 2.1909,
        19.6200, 6.1009, 2.2010, 19.5260, 4.5390, 2.1895, 19.9330, 5.3619,
        2.2351, 20.0550, 4.6626, 2.2480, 19.8140, 5.3290])

Epoch 0014 | Training loss 12.533939 | Training R2 0.574691 | Validation loss 14.716722 | Validation R2 0.470956
Best loss 14.716722 | Best epoch 0014

100%##### 672/672 [01:33:00:00, 7.21it/s]
tensor([ 6.7641, 18.5630, 6.5979, 23.9049, 15.6916], grad_fn=IndexBackward0)
tensor([12.8470, 12.6880, 1.0025, 53.5960, 12.8470])

Epoch 0015 | Training loss 12.104251 | Training R2 0.603352 | Validation loss 14.334991 | Validation R2 0.498045
Best loss 14.334991 | Best epoch 0015

100%##### 672/672 [01:33:00:00, 7.17it/s]
tensor([13.9795, 46.5063, 19.0063, 4.8340, 29.5911, 16.0146, 4.0011, 21.8330,
        12.0601, 4.3595], grad_fn=IndexBackward0)
tensor([14.0340, 52.5400, 13.3090, 1.0996, 54.0650, 14.0150, 1.9913, 37.1700,
        11.0500, 1.9024])

Epoch 0016 | Training loss 11.550021 | Training R2 0.630832 | Validation loss 13.747127 | Validation R2 0.538370
Best loss 13.747127 | Best epoch 0016

100%##### 672/672 [01:34:00:00, 7.11it/s]
tensor([ 4.0921, 10.3004, 5.8134, 5.1207, 14.0096, 5.4195, 14.2547,
        6.1746, 13.5347, 6.7133, 14.0622, 10.0545, 7.3026, 10.5945, 8.0017,
        11.2127, 8.0017, 15.2600, 11.0977, 9.8144, 12.7852, 10.7657, 13.3170,
        11.0920, 11.6402, 14.6160, 12.6066, 15.4900, 13.4973],
        grad_fn=IndexBackward0)
tensor([ 2.9329, 10.1390, 2.0114, 19.1000, 2.9610, 16.6620, 2.9542, 19.3020,
        2.9922, 19.2630, 2.9061, 19.0600, 7.9980, 2.9560, 7.4813, 2.9011,
        7.4269, 2.9277, 19.0100, 7.4794, 2.9604, 7.5152, 2.9625, 6.4910,
        3.3300, 2.9231, 7.5100, 2.9639, 7.4401, 2.9329])

Epoch 0017 | Training loss 11.009770 | Training R2 0.667053 | Validation loss 13.340640 | Validation R2 0.565266
Best loss 13.340640 | Best epoch 0017

100%##### 672/672 [01:35:00:00, 7.03it/s]
tensor([16.4245, 59.1090, 21.0300], grad_fn=IndexBackward0)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0018 | Training loss 10.320520 | Training R2 0.711641 | Validation loss 11.873363 | Validation R2 0.655636
Best loss 11.873363 | Best epoch 0018
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100%##### 672/672 [01:36<00:00, 6.98it/s]
tensor([17.6073, 63.8990, 24.1658, 5.6614, 44.2576, 22.5470, 6.5664],
       grad_fn=IndexBackward0)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4890, 19.8330, 2.0444])

Epoch 0019 | Training loss 9.479385 | Training R2 0.756734 | Validation loss 11.387576 | Validation R2 0.687673
Best loss 11.307576 | Best epoch 0019

100%##### 672/672 [01:38<00:00, 6.83it/s]
tensor([22.7205, 66.8940, 26.8813, 15.5833], grad_fn=IndexBackward0)
tensor([48.1440, 50.7900, 7.5206, 1.1606])

Epoch 0020 | Training loss 8.340364 | Training R2 0.811679 | Validation loss 8.864890 | Validation R2 0.808037
Best loss 8.864890 | Best epoch 0020

100%##### 672/672 [01:41<00:00, 6.59it/s]
tensor([10.0021, 26.9307, 20.8408, 17.0122, 21.6345, 15.8513, 36.3300, 25.5300,
       17.7422, 30.3660, 18.7054, 27.2397, 19.3506, 30.3209, 19.6491],
       grad_fn=IndexBackward0)
tensor([20.9330, 26.7620, 22.9070, 19.9020, 13.0070, 17.6410, 40.8390, 29.5720,
       19.3340, 35.8700, 20.3400, 31.7000, 20.7250, 36.8060, 20.8550])

Epoch 0021 | Training loss 7.650942 | Training R2 0.841526 | Validation loss 8.756156 | Validation R2 0.812718
Best loss 8.756156 | Best epoch 0021

100%##### 672/672 [01:47<00:00, 6.26it/s]
tensor([ 3.7500, 33.9920, 0.2500, 1.2067, -1.6602, 12.1911, 12.2437, 1.5200,
       -1.5805, -1.8975, 11.5778, 1.3445, -1.2041, -1.4602],
       grad_fn=IndexBackward0)
tensor([ 0.4160, 38.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944,
       0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322])

Epoch 0022 | Training loss 6.915258 | Training R2 0.870537 | Validation loss 6.880650 | Validation R2 0.884085
Best loss 6.880650 | Best epoch 0022

100%##### 672/672 [02:03<00:00, 5.44it/s]
tensor([ 1.5390, 4.4927, 3.3403, 2.5443, 1.9090, 0.1433, -0.4094, -0.6202,
       -0.6513, -0.6544, 2.8099, -0.0019, -0.3231, -0.5211, -0.5400, 2.8710,
       0.0123, -0.4279, -0.4479], grad_fn=IndexBackward0)
tensor([0.1027, 4.3675, 3.3207, 2.6709, 2.2198, 1.1100, 0.6720, 0.3420, 0.2066,
       0.1240, 4.4427, 1.1442, 0.0104, 0.3513, 0.1277, 4.4450, 1.1451, 0.3516,
       0.1278])

Epoch 0023 | Training loss 6.409317 | Training R2 0.888788 | Validation loss 6.464874 | Validation R2 0.897908
Best loss 6.464874 | Best epoch 0023

100%##### 672/672 [02:22<00:00, 4.72it/s]
tensor([ 9.2943, 67.5940, 20.8247, 3.1299, 21.1432, 4.3623, 20.8246, 4.6365,
       21.1392, 5.1836], grad_fn=IndexBackward0)
tensor([ 2.0309, 55.6500, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0559,
       15.0010, 2.0309])

Epoch 0024 | Training loss 6.434866 | Training R2 0.887099 | Validation loss 6.995244 | Validation R2 0.880470
Best loss 6.464874 | Best epoch 0023

100%##### 672/672 [02:31<00:00, 4.44it/s]
tensor([ 7.0000, 75.9345, 57.3135, 47.6540, 39.5210, 14.2651, 2.0937, -0.6304,
       -2.3179, 50.9520, 15.1300, 2.2615, -1.0054, 57.1460, 16.1390, 3.2200,
       0.1911], grad_fn=IndexBackward0)
tensor([ 1.7195, 93.2850, 73.9670, 62.0350, 53.2360, 26.3850, 11.4010, 10.5733,
       4.9950, 75.1950, 26.9070, 10.1920, 5.0947, 73.0930, 26.4440, 10.0160,
       5.0000])

Epoch 0025 | Training loss 6.013347 | Training R2 0.902105 | Validation loss 6.196391 | Validation R2 0.906212
Best loss 6.196391 | Best epoch 0025

100%##### 672/672 [02:39<00:00, 4.21it/s]
tensor([24.2445, 61.1090], grad_fn=IndexBackward0)
tensor([47.0150, 46.0300])

Epoch 0026 | Training loss 6.441009 | Training R2 0.887085 | Validation loss 5.943230 | Validation R2 0.913719
Best loss 5.943230 | Best epoch 0026

100%##### 672/672 [02:41<00:00, 4.16it/s]
tensor([20.4604, 46.3007, 21.7751], grad_fn=IndexBackward0)
tensor([28.6530, 67.5770, 24.1020])

Epoch 0027 | Training loss 6.147571 | Training R2 0.897686 | Validation loss 5.676152 | Validation R2 0.921299
Best loss 5.676152 | Best epoch 0027

100%##### 672/672 [02:39<00:00, 4.21it/s]
tensor([ 5.5009, 51.0624, 13.1392, 2.6100], grad_fn=IndexBackward0)
tensor([ 1.6420, 52.0970, 9.0003, 1.9523])

Epoch 0028 | Training loss 6.355262 | Training R2 0.890656 | Validation loss 5.830716 | Validation R2 0.916727
Best loss 5.676152 | Best epoch 0027

100%##### 672/672 [02:42<00:00, 4.12it/s]
tensor([10.5076, 63.3576, 17.0130, 3.0357, 61.1607, 10.1363, 3.4611, 61.1664,
       17.9906, 5.9321, 3.2432], grad_fn=IndexBackward0)
tensor([ 7.3120, 60.1970, 10.1710, 3.1501, 62.0600, 19.0200, 3.2970, 62.7360,
       19.2460, 7.4009, 3.3370])

Epoch 0029 | Training loss 6.041739 | Training R2 0.901178 | Validation loss 5.606994 | Validation R2 0.923200
Best loss 5.606994 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py --fold 5 --model 1 --save fold 5 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:32<00:00, 7.28it/s]
tensor([2.1999, 5.6524, 5.8410, 6.1936, 9.4060, 9.8432],
       grad_fn=IndexBackward0)
tensor([ 2.0309, 55.6500, 16.1950, 2.1095, 15.9100, 2.1521])

Epoch 0001 | Training loss 24.507435 | Training R2 -0.636649 | Validation loss 29.936550 | Validation R2 -1.189140
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:33<00:00, 7.22it/s]
tensor([ 4.9043, 0.9507, 0.2366, 9.5305, 13.3045, 13.5179, 13.6512,
       13.7654, 17.0186, 17.9522, 10.0050], grad_fn=IndexBackward0)
tensor([ 4.7756, 60.3000, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
       1.6243, 63.0070, 16.7090, 4.7756])

Epoch 0002 | Training loss 25.403650 | Training R2 -0.758136 | Validation loss 33.067993 | Validation R2 -1.671072
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:29<00:00, 7.40it/s]
tensor([ 7.0014, 11.0011, 11.0205], grad_fn=IndexBackward0)
tensor([13.0520, 60.0710, 23.1030])

Epoch 0003 | Training loss 24.522160 | Training R2 -0.627971 | Validation loss 32.016544 | Validation R2 -1.503911
Best loss 29.936550 | Best epoch 0001

100%##### 672/672 [01:32<00:00, 7.23it/s]
tensor([ 7.3291, 10.1600, 10.0233, 9.0829], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2040, 2.9020])

Epoch 0004 | Training loss 22.401255 | Training R2 -0.358544 | Validation loss 28.629200 | Validation R2 -1.002123
Best loss 28.629200 | Best epoch 0004

100%##### 672/672 [01:30<00:00, 7.46it/s]
tensor([14.4474, 19.0099, 19.4270, 10.6136, 23.0021, 21.7730, 26.9901, 26.1410,
       24.3604, 20.5200, 26.5102], grad_fn=IndexBackward0)
tensor([20.1000, 76.4000, 23.3070, 3.2060, 20.8640, 3.3441, 70.0070, 24.2140,
       3.3317, 23.0640, 3.2036])

Epoch 0005 | Training loss 19.169922 | Training R2 0.005122 | Validation loss 21.290998 | Validation R2 -0.107291
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([12.2309, 10.9201, 10.0005, 16.3241, 20.7797, 10.0313, 22.0640, 20.6343,
       24.4405, 21.9717], grad_fn=IndexBackward0)
tensor([ 2.0309, 55.6500, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0559,
       15.0010, 2.0309])

Epoch 0006 | Training loss 19.670331 | Training R2 -0.040349 | Validation loss 22.492300 | Validation R2 -0.235770
Best loss 21.290998 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([ 9.0321, 16.7140, 15.5700, 14.4203], grad_fn=IndexBackward0)
tensor([ 3.1494, 45.2250, 11.2040, 2.9020])

Epoch 0007 | Training loss 10.430303 | Training R2 0.079004 | Validation loss 20.071935 | Validation R2 -0.064132
Best loss 20.071935 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([ 0.2794, 0.7751, 0.5404, -0.3596, -1.0415, -1.9520, -2.6350, -3.3204,
       -2.3760, -4.0057, -5.6395], grad_fn=IndexBackward0)
tensor([0.2320, 4.0372, 3.1660, 1.2210, 0.5990, 0.2310, 0.1130, 0.0557, 7.0164,
       1.2240, 0.2320])

Epoch 0008 | Training loss 20.370321 | Training R2 -0.123375 | Validation loss 23.957009 | Validation R2 -0.402050
```

```
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.51it/s]
tensor([17.7417, 27.3907, 25.9383], grad_fn=IndexBackward0>)
tensor([13.8520, 68.8710, 23.1830])

Epoch 0009 | Training loss 19.004763 | Training R2 0.013942 | Validation loss 21.900900 | Validation R2 -0.171647
Best loss 20.871935 | Best epoch 0007

100%##### 672/672 [01:31<00:00, 7.36it/s]
tensor([17.3056, 25.6101, 24.2517, 20.7200, 26.5591, 24.9605, 21.8946, 26.8496,
25.2540, 22.2393], grad_fn=IndexBackward0>)
tensor([17.8030, 55.3190, 16.9870, 2.1271, 56.8470, 17.5230, 2.1942, 57.7130,
17.7900, 2.2277])

Epoch 0010 | Training loss 17.859484 | Training R2 0.136499 | Validation loss 20.114540 | Validation R2 0.011697
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([ 8.7530, 19.8132, 16.0510, 16.2682, 22.7456, 19.5403, 19.2723],
grad_fn=IndexBackward0>)
tensor([ 9.2660, 25.5950, 5.0055, 3.7205, 26.2690, 4.4291, 3.8185])

Epoch 0011 | Training loss 18.237335 | Training R2 0.099566 | Validation loss 20.373814 | Validation R2 -0.013945
Best loss 20.114540 | Best epoch 0010

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([ 9.9975, 15.6876, 13.4450, 11.2903, 17.1275, 15.1765, 11.2384],
grad_fn=IndexBackward0>)
tensor([14.9510, 17.0860, 6.4340, 2.7857, 51.9570, 17.6200, 2.8727])

Epoch 0012 | Training loss 17.548340 | Training R2 0.166316 | Validation loss 19.443098 | Validation R2 0.076577
Best loss 19.443098 | Best epoch 0012

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([ 9.9177, 18.4395, 17.9721, 17.5216, 14.3823, 12.5939, 11.2551, 9.9186,
16.4753, 13.0464], grad_fn=IndexBackward0>)
tensor([ 4.1835, 35.5470, 2.2700, 24.3620, 6.9018, 3.3599, 1.9501, 1.1412,
14.7460, 4.1835])

Epoch 0013 | Training loss 17.206947 | Training R2 0.198439 | Validation loss 19.141432 | Validation R2 0.105009
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([12.4364, 27.2565, 23.2694, 19.6116, 16.4919, 29.9806, 27.1092, 23.8359,
20.2024], grad_fn=IndexBackward0>)
tensor([ 4.7756, 60.3800, 16.0390, 4.5623, 1.5531, 62.9590, 16.7740, 4.7714,
1.6243])

Epoch 0014 | Training loss 17.306837 | Training R2 0.109105 | Validation loss 19.362793 | Validation R2 0.084189
Best loss 19.141432 | Best epoch 0013

100%##### 672/672 [01:31<00:00, 7.32it/s]
tensor([ 9.0599, 20.0499, 19.4907, 18.9320, 17.8166, 16.1479, 12.2752, 10.0752,
0.9780, 10.0757, 14.2077, 10.3545, 0.6502, 10.4221, 14.3102, 10.7025,
9.1701], grad_fn=IndexBackward0>)
tensor([ 1.7205, 44.0430, 33.0500, 27.3170, 18.5670, 10.6030, 2.0810, 1.3604,
0.9421, 27.6900, 6.1533, 1.6721, 0.9507, 23.0690, 0.2359, 1.6946,
0.9695])

Epoch 0015 | Training loss 16.755096 | Training R2 0.239911 | Validation loss 19.031542 | Validation R2 0.115256
Best loss 19.031542 | Best epoch 0015

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([ 0.9502, 1.0900, 0.4545, -1.0299, -3.4424, -5.5529, -7.1400,
-8.7240, -7.3052, -10.9310, -14.420], grad_fn=IndexBackward0>)
tensor([0.2320, 4.0372, 3.1660, 1.2210, 0.5990, 0.2310, 0.1130, 0.0057, 7.0164,
1.2240, 0.2320])

Epoch 0016 | Training loss 16.645119 | Training R2 0.249928 | Validation loss 18.393700 | Validation R2 0.173566
Best loss 18.393700 | Best epoch 0016

100%##### 672/672 [01:35<00:00, 7.07it/s]
tensor([ 6.0242, 20.9003, 15.5757, 10.6441, 6.5071, 20.2002, 15.3091, 10.3295,
6.4992, 19.2014, 16.2200, 12.1360, 0.1073], grad_fn=IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3010, 4.1701, 1.6409, 41.0410, 12.7110, 4.2013,
1.6040, 42.0210, 13.2660, 4.4600, 1.7501])

Epoch 0017 | Training loss 16.093096 | Training R2 0.298854 | Validation loss 17.970434 | Validation R2 0.211163
Best loss 17.970434 | Best epoch 0017

100%##### 672/672 [01:40<00:00, 6.72it/s]
tensor([12.0932, 35.1505, 29.2565, 17.6236, 35.2379, 31.1231, 21.2395],
grad_fn=IndexBackward0>)
tensor([ 3.0765, 62.3000, 16.2100, 1.3937, 63.5960, 16.5530, 1.4231])

Epoch 0018 | Training loss 15.311303 | Training R2 0.365315 | Validation loss 16.984724 | Validation R2 0.295328
Best loss 16.984724 | Best epoch 0018

100%##### 672/672 [01:51<00:00, 6.03it/s]
tensor([16.5402, 29.7475, 20.0376], grad_fn=IndexBackward0>)
tensor([21.0100, 30.1050, 21.5600])

Epoch 0019 | Training loss 14.230635 | Training R2 0.451751 | Validation loss 15.054130 | Validation R2 0.306019
Best loss 15.054130 | Best epoch 0019

100%##### 672/672 [02:03<00:00, 5.43it/s]
tensor([19.7460, 42.1145, 30.2000, 14.1110, 37.0093, 25.5962, 11.4744, 34.7014,
11.2551, 33.2510, 23.2312, 11.2077, 33.0095, 23.2144, 11.2046, 32.0909,
23.1463, 11.2140, 32.9500, 23.3397, 11.3044, 32.9221, 23.4265, 11.5103,
23.5026, 11.6603, 32.9310, 23.6521, 11.7040, 32.9144, 23.7639],
grad_fn=IndexBackward0>)
tensor([19.0400, 53.1050, 18.5150, 3.2922, 56.7650, 19.9600, 3.5006, 57.2050,
3.5796, 56.8250, 19.9970, 3.5550, 56.0030, 19.9170, 3.5416, 56.1670,
19.7650, 3.5145, 56.5720, 19.9040, 3.5392, 56.4240, 19.0470, 3.5291,
19.0520, 3.5300, 56.3040, 19.0300, 3.5261, 56.4400, 19.0400])

Epoch 0020 | Training loss 12.025496 | Training R2 0.608497 | Validation loss 13.721763 | Validation R2 0.540072
Best loss 13.721763 | Best epoch 0020

100%##### 672/672 [02:27<00:00, 4.56it/s]
tensor([11.1434, 49.1650, 25.2540, 12.7403], grad_fn=IndexBackward0>)
tensor([ 0.4305, 64.0190, 10.0300, 2.4664])

Epoch 0021 | Training loss 12.230107 | Training R2 0.595001 | Validation loss 13.446256 | Validation R2 0.558356
Best loss 13.446256 | Best epoch 0021

100%##### 672/672 [02:41<00:00, 4.15it/s]
tensor([ 7.0400, 35.5030, 31.0140, 27.4297, 23.0300, 15.3497, 39.0910, 20.7233,
10.5093, 41.4940, 30.0920, 19.0995, 41.0754, 30.6326, 20.1299, 30.6022,
20.5340, 30.5935, 21.5521], grad_fn=IndexBackward0>)
tensor([12.5700, 31.0440, 25.2520, 20.7650, 17.3000, 10.5040, 40.6700, 22.0730,
13.9090, 43.5540, 24.4400, 15.0630, 44.0460, 35.0700, 15.2700, 35.0460,
15.3300, 35.0950, 15.3590])

Epoch 0022 | Training loss 9.790716 | Training R2 0.740408 | Validation loss 12.751149 | Validation R2 0.602037
Best loss 12.751149 | Best epoch 0022

100%##### 672/672 [02:39<00:00, 4.22it/s]
tensor([14.1660, 61.5551, 29.6013, 8.0076, 50.5753, 24.2045, 8.0032],
grad_fn=IndexBackward0>)
tensor([ 6.2430, 65.0400, 25.1000, 4.2933, 69.2210, 23.5690, 4.5701])

Epoch 0023 | Training loss 8.497423 | Training R2 0.004519 | Validation loss 10.055521 | Validation R2 0.712147
Best loss 10.055521 | Best epoch 0023

100%##### 672/672 [02:46<00:00, 4.03it/s]
tensor([15.0495, 61.9607, 20.1403, 10.4400], grad_fn=IndexBackward0>)
tensor([10.4370, 63.6710, 21.1050, 2.2930])

Epoch 0024 | Training loss 7.026572 | Training R2 0.066335 | Validation loss 7.219300 | Validation R2 0.072690
Best loss 7.219300 | Best epoch 0024

100%##### 672/672 [03:05<00:00, 3.62it/s]
tensor([15.0177, 53.2453, 22.2400, 13.1297, 52.0000, 24.2000],
grad_fn=IndexBackward0>)
tensor([20.1000, 53.7010, 19.0000, 3.5221, 56.3000, 20.1000])

Epoch 0025 | Training loss 22.096203 | Training R2 -0.321005 | Validation loss 31.622337 | Validation R2 -1.442631
Best loss 7.219300 | Best epoch 0024

100%##### 672/672 [03:00<00:00, 3.71it/s]
tensor([ 9.0573, 64.0450, 19.9370, 7.2607, 4.3320, 59.0010, 15.9035, 3.0537],
grad_fn=IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270, 9.6255, 3.0403, 61.0700, 21.7700, 3.9666])

Epoch 0026 | Training loss 6.403774 | Training R2 0.088900 | Validation loss 6.044273 | Validation R2 0.910760
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [02:59<00:00, 3.74it/s]
tensor([ 6.9223, 61.5160, 18.7002, 3.0362, 18.1905, 2.9401, 18.2441, 2.0033],
grad_fn=IndexBackward0>)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0559])

Epoch 0027 | Training loss 6.205529 | Training R2 0.095747 | Validation loss 6.115032 | Validation R2 0.900659
Best loss 6.044273 | Best epoch 0026

100%##### 672/672 [03:01<00:00, 3.70it/s]
tensor([ 6.0950, 60.9704, 50.3774, 41.0519, 20.7659, 16.2004, 8.0670, 3.7320,
2.4390], grad_fn=IndexBackward0>)
tensor([10.7920, 67.0230, 50.2400, 40.4500, 20.0000, 18.4230, 11.0000, 6.6646,
4.3127])

Epoch 0028 | Training loss 6.350976 | Training R2 0.090528 | Validation loss 5.880602 | Validation R2 0.915296
Best loss 5.880602 | Best epoch 0028

100%##### 672/672 [02:59<00:00, 3.74it/s]
tensor([ 5.4355, 52.7556, 12.0100, 2.5391], grad_fn=IndexBackward0>)
tensor([ 1.6420, 52.0970, 9.0003, 1.9523])
```

```
Epoch 0029 | Training loss 6.320073 | Training R2 0.891863 | Validation loss 5.790334 | Validation R2 0.918101
Best loss 5.790334 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/f5fold_models/Neural-ODE/run_train.py --fold 5 --model 2 --save fold_5 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([ 2.8724,  6.5957,  6.8080,  6.9899,  7.2021, 10.7213, 10.9348, 11.3314,
        14.0272, 15.0422, 15.1036, 15.4413, 18.9374, 19.1537, 19.5554, 23.0516,
        23.6493, 23.6750, 27.3578, 27.6802, 27.7960, 30.7720, 30.9930, 31.2133],
       grad_fn=<IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270,  9.6255,  3.8483, 61.8760, 21.7760,  3.9666,
        61.4200, 21.6510, 16.6500,  3.9430, 61.4060, 21.6430,  3.9424, 61.4240,
        21.6460,  3.9429, 24.6850,  8.6517,  3.9430, 52.7130, 18.6040,  7.4356])

Epoch 0001 | Training loss 25.439198 | Training R2 -0.752008 | Validation loss 31.925747 | Validation R2 -1.409729
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.44it/s]
tensor([ 3.2931,  5.3593,  5.3786,  5.3988,  5.4173,  5.4752,  7.2988,  7.3569,
        7.4149,  9.1766,  9.2347,  9.2928, 11.0515, 11.1676, 12.9117, 13.0278,
        14.7801, 14.9023, 16.0606, 16.7768, 18.5866, 18.6228, 20.3668, 20.4830,
        22.2271, 22.3433, 24.1067, 24.2035, 25.9676, 26.8638, 27.7936, 27.9099,
        29.6397, 29.7559, 31.4857, 31.6020, 33.4481, 35.1973, 35.2942, 37.0240,
        37.1403, 38.8781, 38.9064, 40.7162, 40.8325, 42.5338, 42.6501, 44.3800,
        44.4963, 46.1862, 46.2250], grad_fn=<IndexBackward0>)
tensor([13.4790, 18.8570, 13.8900, 10.7480,  8.5627,  4.6489, 22.6090, 10.6930,
        5.8463, 23.2430, 11.0050,  6.0691, 23.4230,  6.1265, 23.3150,  6.1035,
        23.4510,  6.1355, 23.4760,  6.1434, 23.1700,  6.0705, 23.2750,  6.0099,
        23.2850,  6.0940, 17.6110,  6.0951, 23.2930,  6.0960, 23.1300,  6.0502,
        23.1120,  6.0491, 23.1050,  6.0467,  6.0455, 17.4690,  6.0458, 23.1040,
        6.0462, 23.0900,  6.0454, 23.0970,  6.0451, 22.8050,  5.9719, 23.0390,
        6.0265, 22.6590, 13.4790])

Epoch 0002 | Training loss 26.376934 | Training R2 -0.883553 | Validation loss 34.834122 | Validation R2 -1.964010
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.47it/s]
tensor([ 7.8250, 11.0704, 11.0799, 11.0814, 11.8073, 11.0917, 11.0975, 11.9019,
        11.9002, 15.7652, 15.7763, 15.7875], grad_fn=<IndexBackward0>)
tensor([ 2.8854, 42.8900, 34.5060, 27.9040, 12.2340,  6.5823,  2.8806,  1.5499,
        0.8339, 54.9410, 12.2540,  2.8854])

Epoch 0003 | Training loss 24.805820 | Training R2 -0.665852 | Validation loss 32.632885 | Validation R2 -1.601243
Best loss 31.925747 | Best epoch 0001

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([ 8.7306, 11.7069, 11.5418, 11.3754, 11.2797, 11.2316, 13.9237, 13.7604,
        13.6609, 13.6202, 16.3320, 16.2147, 16.1207, 16.0730],
       grad_fn=<IndexBackward0>)
tensor([ 5.1825, 48.9670, 16.9790,  6.3620,  6.3007,  2.7427, 18.1490,  6.8004,
        3.8809,  2.9318, 14.1770,  7.0320,  4.0131,  3.0316])

Epoch 0004 | Training loss 22.594074 | Training R2 -0.382033 | Validation loss 29.154833 | Validation R2 -1.076304
Best loss 29.154833 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.55it/s]
tensor([13.8576, 17.9291, 17.4015, 16.8603], grad_fn=<IndexBackward0>)
tensor([48.1440, 50.7900,  7.5206,  1.1606])

Epoch 0005 | Training loss 19.321512 | Training R2 -0.010675 | Validation loss 21.662233 | Validation R2 -0.146242
Best loss 21.662233 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.55it/s]
tensor([11.5918, 16.2894, 16.0552], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1650, 21.5660])

Epoch 0006 | Training loss 18.806362 | Training R2 0.042500 | Validation loss 20.810762 | Validation R2 -0.057903
Best loss 20.810762 | Best epoch 0006

100%##### 672/672 [01:30<00:00, 7.46it/s]
tensor([13.7967, 24.9147, 23.5840, 22.4126, 21.0541, 27.8658, 26.2462, 23.2119],
       grad_fn=<IndexBackward0>)
tensor([ 7.4356, 60.5650, 21.1270,  9.6255,  3.8483, 61.8760, 21.7760,  3.9666])

Epoch 0007 | Training loss 10.502975 | Training R2 0.073144 | Validation loss 20.257120 | Validation R2 -0.002364
Best loss 20.257120 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 7.3947, 16.2876, 14.5021], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0008 | Training loss 17.804424 | Training R2 0.134077 | Validation loss 19.712755 | Validation R2 0.050785
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([ 7.4039, 16.9333, 14.2522], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0009 | Training loss 18.018396 | Training R2 0.121056 | Validation loss 20.877218 | Validation R2 -0.064670
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:30<00:00, 7.43it/s]
tensor([0.6249, 7.0101, 7.3232, 3.8304, 1.10693], grad_fn=<IndexBackward0>)
tensor([0.1817, 6.2759, 4.8730, 0.8292, 0.1817])

Epoch 0010 | Training loss 17.464170 | Training R2 0.174295 | Validation loss 20.522924 | Validation R2 -0.028841
Best loss 19.712755 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 9.3216, 15.8665,  8.5315, 12.2728,  7.97373], grad_fn=<IndexBackward0>)
tensor([15.8300, 13.0430,  1.2600, 15.9120,  1.2850])

Epoch 0011 | Training loss 15.910045 | Training R2 0.314645 | Validation loss 18.190824 | Validation R2 0.190985
Best loss 18.190824 | Best epoch 0011

100%##### 672/672 [01:31<00:00, 7.35it/s]
tensor([ 4.3649, 16.5007], grad_fn=<IndexBackward0>)
tensor([ 2.4489, 16.6950])

Epoch 0012 | Training loss 15.860010 | Training R2 0.310949 | Validation loss 18.750023 | Validation R2 0.141237
Best loss 18.190824 | Best epoch 0011

100%##### 672/672 [01:32<00:00, 7.20it/s]
tensor([ 8.7004, 25.0000, 17.3550,  8.8191,  3.7224,  1.3463, 10.4619,  6.1137,
        2.9816, 10.1290,  7.5545,  4.8109,  4.4530], grad_fn=<IndexBackward0>)
tensor([ 7.2829, 42.8440, 12.3400,  4.1313,  1.6174,  1.6724, 20.9970,  5.9940,
        1.7166, 17.7690,  5.9424,  1.9090,  1.7019])

Epoch 0013 | Training loss 13.904661 | Training R2 0.476500 | Validation loss 15.886096 | Validation R2 0.383479
Best loss 15.886096 | Best epoch 0013

100%##### 672/672 [01:33<00:00, 7.20it/s]
tensor([ 7.0433, 27.5600, 16.8307,  7.2300,  0.1864,  9.9691,  3.3722, -0.6687,
        7.9050,  3.2674, -0.1207], grad_fn=<IndexBackward0>)
tensor([ 1.7436, 45.8730, 13.5250,  4.4509,  1.7225, 16.4400,  5.4192,  1.7866,
        16.0500,  5.2932,  1.7451])

Epoch 0014 | Training loss 12.929752 | Training R2 0.547405 | Validation loss 15.179044 | Validation R2 0.437194
Best loss 15.179044 | Best epoch 0014

100%##### 672/672 [01:34<00:00, 7.09it/s]
tensor([ 7.4332, 30.5729, 16.2396], grad_fn=<IndexBackward0>)
tensor([ 0.9012, 40.1090, 10.2340])

Epoch 0015 | Training loss 12.248608 | Training R2 0.593035 | Validation loss 14.446182 | Validation R2 0.490228
Best loss 14.446182 | Best epoch 0015

100%##### 672/672 [01:35<00:00, 7.06it/s]
tensor([ 4.6836,  7.6900,  7.1004, 17.4322, 10.2643,  9.2034, 19.0746, 11.5507,
        10.7448, 13.1053, 12.3932, 20.9605, 14.0527, 22.7131, 18.0290],
       grad_fn=<IndexBackward0>)
tensor([ 8.4665,  2.6600,  2.2691, 18.5760,  3.2225,  2.3435, 25.5770,  3.2261,
        2.3462,  3.2262,  2.3463, 25.6730,  2.3549, 30.2890,  8.4665])

Epoch 0016 | Training loss 11.735577 | Training R2 0.627147 | Validation loss 14.173969 | Validation R2 0.509258
Best loss 14.173969 | Best epoch 0016

100%##### 672/672 [01:36<00:00, 6.93it/s]
tensor([11.6500, 60.2137, 25.1021, 10.0511], grad_fn=<IndexBackward0>)
tensor([ 5.7740, 65.1420, 19.1870,  6.7725])

Epoch 0017 | Training loss 10.962422 | Training R2 0.674656 | Validation loss 14.000322 | Validation R2 0.521209
Best loss 14.000322 | Best epoch 0017

100%##### 672/672 [01:43<00:00, 6.52it/s]
tensor([ 1.9511, 20.6097,  3.2096, -2.9803, -5.5950, 20.0863,  5.9632, -0.5994,
        -0.8749, 19.8103,  6.0704, -1.1292, -4.3055, 19.2795,  7.1646,  0.7701,
        -3.7093], grad_fn=<IndexBackward0>)
tensor([ 0.1465, 23.7240,  3.6020,  0.5996,  0.1266, 35.6020,  5.5209,  1.1669,
        0.1900, 35.4800,  5.5170,  0.8985,  0.1896, 35.4800,  7.1499,  1.5090,
```

```
0.1896])

Epoch 0018 | Training loss 8.945731 | Training R2 0.783349 | Validation loss 10.094747 | Validation R2 0.751079
Best loss 10.094747 | Best epoch 0018

100%##### 672/672 [02:03<00:00, 5.46it/s]
tensor([18.3029, 63.2539, 29.43179, 9.5281, 46.2599, 19.9418, 4.2955, 35.4959,
        16.3430, 3.1342, 26.7132, 12.0767, 3.3039, 2.6298],
       grad_fn=<IndexBackward0>)
tensor([17.6690, 69.9310, 10.6240, 2.0229, 70.4890, 19.8330, 2.0444, 57.7000,
        16.2380, 1.6738, 44.0250, 12.3930, 1.8120, 1.2775])

Epoch 0019 | Training loss 8.020597 | Training R2 0.789368 | Validation loss 9.154214 | Validation R2 0.795303
Best loss 9.154214 | Best epoch 0019

100%##### 672/672 [02:18<00:00, 4.85it/s]
tensor([ 4.1644, 14.0120, -0.3130, 27.27210, 10.2752, -0.3314, 23.0703, 7.9699,
        -0.3345], grad_fn=<IndexBackward0>)
tensor([ 1.7265, 18.3160, 2.4943, 49.3078, 15.7180, 2.1405, 40.9940, 12.9500,
        1.7635])

Epoch 0020 | Training loss 7.317793 | Training R2 0.855026 | Validation loss 7.885971 | Validation R2 0.848092
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:28<00:00, 4.52it/s]
tensor([ 8.4705, 47.7004, 13.9731, 1.0199, 41.2189, 11.3355, 1.4946, 40.8071,
        13.6375, 2.4164, 39.6342, 12.4571, 3.1626], grad_fn=<IndexBackward0>)
tensor([ 2.9463, 47.9160, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370,
        18.1500, 2.9979, 52.4890, 15.7600, 2.9900])

Epoch 0021 | Training loss 7.042254 | Training R2 0.865738 | Validation loss 8.384034 | Validation R2 0.828265
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:34<00:00, 4.36it/s]
tensor([ 4.4215, 36.0008, 8.1078, 0.6668, -1.3523, -1.4276, 11.2206, -0.1053,
        -1.8085, -1.9566, 9.4959, -0.7273, -2.5235, -2.5964, 8.4442, -2.1228,
        -3.3086, -3.3706], grad_fn=<IndexBackward0>)
tensor([ 0.4168, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5080, 1.7944,
        0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7820, 1.6812,
        0.4172, 0.3307])

Epoch 0022 | Training loss 9.585545 | Training R2 0.751250 | Validation loss 10.479862 | Validation R2 0.731724
Best loss 7.885971 | Best epoch 0020

100%##### 672/672 [02:35<00:00, 4.32it/s]
tensor([ 7.7273, 48.1425, 12.7922, 1.4126, 44.4121, 10.8110, 1.8509, 44.7639,
        13.0070, 1.6967, 44.0305, 10.4309, 1.3453], grad_fn=<IndexBackward0>)
tensor([ 2.9463, 47.9160, 16.4030, 2.7004, 51.2510, 15.3770, 2.9173, 52.6370,
        18.1500, 2.9979, 52.4890, 15.7600, 2.9900])

Epoch 0023 | Training loss 6.300526 | Training R2 0.892531 | Validation loss 5.878633 | Validation R2 0.915584
Best loss 5.878633 | Best epoch 0023

100%##### 672/672 [02:38<00:00, 4.25it/s]
tensor([ 4.2463, 36.7811, 0.6615, 1.4889, -0.0500, -0.0957, 12.9539, 1.7627,
        0.3970, 0.3455, 12.1383, 1.0436, 0.3057, 0.3445, 11.9547, 1.1000,
        0.2285, 0.1806, 11.7720, 1.7816, 0.1001, 7.4648, 1.6911, 0.0025,
        11.4607, 0.7494, -0.1261, -0.1730, 0.2674, -0.3031, 30.3001, 6.5045,
        0.4006, -0.2833], grad_fn=<IndexBackward0>)
tensor([ 0.4168, 38.0910, 7.1603, 1.7787, 0.4414, 0.3499, 11.5080, 1.7944,
        0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3322, 10.7820, 1.6812,
        0.4172, 0.3307, 10.7730, 2.1190, 0.3304, 6.7093, 2.1190, 0.3304,
        10.7810, 1.6811, 0.4171, 0.3307, 1.0556, 0.3304, 35.8960, 6.7693,
        1.3316, 0.4168])

Epoch 0024 | Training loss 6.111111 | Training R2 0.898096 | Validation loss 5.600600 | Validation R2 0.921174
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:43<00:00, 4.12it/s]
tensor([ 8.8150, 11.5567, 4.6076, 11.2782, 5.0257, 6.5838, 5.3709, 11.5210,
        5.6812, 11.6247, 5.9075, 11.7576, 6.1699, 12.0414, 6.4307, 12.2436],
       grad_fn=<IndexBackward0>)
tensor([14.5460, 14.3260, 2.1336, 15.1440, 2.2555, 7.1526, 2.2158, 14.6630,
        2.1838, 14.4490, 2.1519, 14.3450, 2.1365, 14.4340, 2.1497, 14.5460])

Epoch 0025 | Training loss 6.472453 | Training R2 0.886506 | Validation loss 7.626001 | Validation R2 0.857940
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:50<00:00, 3.95it/s]
tensor([ 1.5432, 6.2264, 4.7043, 3.4637, 1.7148, 0.1073, -0.2402, -0.3312,
        -0.3259], grad_fn=<IndexBackward0>)
tensor([0.0402, 5.6725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4778, 0.1872, 0.0927])

Epoch 0026 | Training loss 6.822579 | Training R2 0.873904 | Validation loss 8.459892 | Validation R2 0.825177
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:52<00:00, 3.89it/s]
tensor([12.3208, 41.0046, 31.4636], grad_fn=<IndexBackward0>)
tensor([21.0100, 30.1650, 21.5600])

Epoch 0027 | Training loss 6.095839 | Training R2 0.899400 | Validation loss 6.896765 | Validation R2 0.883812
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [02:50<00:00, 3.95it/s]
tensor([ 3.3590, 30.0050, 32.1050, 26.7014, 11.2770, 5.3100, 1.1977, -0.6329,
        44.5300, 10.9630, 1.2176], grad_fn=<IndexBackward0>)
tensor([ 0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
        39.4790, 6.4477, 1.1231])

Epoch 0028 | Training loss 6.544991 | Training R2 0.884030 | Validation loss 6.196602 | Validation R2 0.906200
Best loss 5.600600 | Best epoch 0024

100%##### 672/672 [03:17<00:00, 3.41it/s]
tensor([ 5.3302, 57.8313, 14.6693, 3.2426, 1.1091, 15.5492, 4.6520, 2.3154,
        50.9204, 16.3007, 2.9490, 2.4515, 56.0230, 16.2949, 5.7094, 2.6612,
        20.1650, 6.1725, 3.0300, 20.9110, 6.0515, 3.4499],
       grad_fn=<IndexBackward0>)
tensor([ 0.8310, 59.4470, 12.7970, 2.9511, 0.0392, 12.6360, 2.9139, 0.8286,
        50.9270, 12.7100, 1.5640, 0.8340, 56.0760, 12.2320, 1.4704, 0.0022,
        15.3490, 3.5396, 0.8163, 15.6260, 3.0834, 0.8310])

Epoch 0029 | Training loss 6.115059 | Training R2 0.898765 | Validation loss 7.040408 | Validation R2 0.878922
Best loss 5.600600 | Best epoch 0024

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] * 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 5 --model 3 --save fold_5 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([ 2.0993, 4.3603, 4.5242, 6.0200, 6.9204, 7.1301, 7.3631, 9.4930,
        9.6565, 9.9135, 12.0199, 12.2073, 12.4649], grad_fn=<IndexBackward0>)
tensor([ 7.1280, 48.3090, 16.0790, 2.5997, 40.2000, 10.9370, 2.6928, 34.4200,
        12.7210, 2.7225, 40.6640, 12.7200, 2.7241])

Epoch 0001 | Training loss 24.240671 | Training R2 -0.590810 | Validation loss 29.140003 | Validation R2 -1.075331
Best loss 29.140003 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.60it/s]
tensor([4.3078, 7.2371, 7.3457], grad_fn=<IndexBackward0>)
tensor([18.2960, 46.2360, 13.6630])

Epoch 0002 | Training loss 25.267263 | Training R2 -0.720405 | Validation loss 32.724815 | Validation R2 -1.615919
Best loss 29.140003 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([ 5.5793, 8.6449, 8.6271, 6.6107, 8.5905, 11.4784, 11.4660, 11.4510],
       grad_fn=<IndexBackward0>)
tensor([ 1.4091, 45.1660, 6.8944, 1.3910, 0.4434, 45.6640, 8.7781, 1.4091])

Epoch 0003 | Training loss 24.392866 | Training R2 -0.610849 | Validation loss 31.869343 | Validation R2 -1.400939
Best loss 29.140003 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.58it/s]
tensor([ 5.8613, 10.4341, 10.1605, 9.9754], grad_fn=<IndexBackward0>)
tensor([ 5.8484, 17.8220, 6.0592, 2.0044])

Epoch 0004 | Training loss 20.007446 | Training R2 -0.003700 | Validation loss 23.670774 | Validation R2 -0.360658
Best loss 23.670774 | Best epoch 0004

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([10.7725, 17.4414, 16.1609, 15.8302, 21.2687, 19.7636, 24.7900, 23.0000,
        27.9219, 25.9707], grad_fn=<IndexBackward0>)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0559,
        15.0010, 2.0309])

Epoch 0005 | Training loss 19.205898 | Training R2 0.001304 | Validation loss 22.241131 | Validation R2 -0.200325
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:29<00:00, 7.56it/s]
tensor([13.6329, 20.3223, 19.5666, 17.8160, 23.6848, 22.6136, 20.0005, 26.5026,
        25.2495, 23.9093, 22.9034], grad_fn=<IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.0600, 19.0200, 3.2970, 62.7360,
        19.2460, 7.4059, 3.3370])
```

Epoch 0006 | Training loss 20.557449 | Training R2 -0.144109 | Validation loss 24.015671 | Validation R2 -0.408832
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:28:00:00, 7.56it/s]
tensor([16.9284, 21.0471, 20.9418, 20.8352, 20.7271, 20.3929, 23.0760, 23.4270,
22.9282, 26.1789, 25.6084, 25.1570, 20.6080, 27.3257, 30.1612, 29.3570,
32.1722, 31.3065, 34.1266, 33.1985, 35.9462, 34.9561, 37.6573, 36.6051,
39.2385, 38.1246, 40.6562, 39.5110, 42.0308, 40.7943],
grad_fn=IndexBackward0))
tensor([38.1730, 32.4920, 24.8420, 20.1090, 16.9610, 11.5390, 42.3870, 24.3350,
16.9860, 47.3100, 27.9650, 19.6630, 34.2530, 20.9790, 35.0450, 21.5240,
35.5990, 21.0790, 36.1540, 22.2220, 36.2560, 22.3030, 36.3190, 22.3450,
36.2250, 22.2940, 36.0400, 22.1840, 35.9840, 22.1450])

Epoch 0007 | Training loss 20.864714 | Training R2 -0.178566 | Validation loss 24.533953 | Validation R2 -0.470297
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:29:00:00, 7.51it/s]
tensor([13.5987, 17.2932, 17.1564, 17.0169], grad_fn=IndexBackward0)
tensor([31.1600, 21.5000, 17.4770, 14.5030])

Epoch 0008 | Training loss 20.585428 | Training R2 -0.147226 | Validation loss 24.066521 | Validation R2 -0.414805
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:28:00:00, 7.56it/s]
tensor([9.4306, 16.3450, 14.2150, 11.4437, 16.6023, 15.0743],
grad_fn=IndexBackward0))
tensor([9.5449, 37.6970, 6.5141, 0.8206, 37.0140, 9.5449])

Epoch 0009 | Training loss 19.902319 | Training R2 -0.072350 | Validation loss 23.161474 | Validation R2 -0.310395
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:28:00:00, 7.56it/s]
tensor([5.5932, 12.3538, 12.0206, 11.6048, 10.3945, 9.4810, 8.2765, 7.3738],
grad_fn=IndexBackward0))
tensor([1.0703, 24.1700, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0010 | Training loss 19.259192 | Training R2 -0.004165 | Validation loss 22.403614 | Validation R2 -0.226044
Best loss 22.241131 | Best epoch 0005

100%##### 672/672 [01:28:00:00, 7.55it/s]
tensor([7.3921, 15.4699, 12.9607, 10.8167, 8.3234, 16.6326, 13.7060, 10.9030,
8.4077, 16.5475, 11.7236, 8.7080, 15.5450, 13.3301, 10.9156,
0.5450, 13.5204, 12.2540, 9.8752, 7.6965, 12.9970, 10.7930, 0.5555,
6.4607, 11.1752, 9.0147, 5.6914, 4.6343, 6.9607, 4.7241, 2.6200,
7.4725, 0.9743, 5.9411, 3.7118, -0.5230, 1.9366, 0.0317, -2.3644,
-0.0617, -2.3752, -4.5300, -0.0170, -2.3210, -4.7410, -7.4294],
grad_fn=IndexBackward0))
tensor([0.7450, 40.8200, 9.9731, 3.1421, 0.8166, 40.8000, 10.0110, 2.6018,
0.0197, 40.8630, 10.0090, 2.6011, 0.0195, 39.2230, 9.6072, 2.4900,
0.7064, 20.7500, 9.6001, 2.4950, 0.7061, 39.1950, 9.6000, 2.4949,
0.7061, 37.7000, 9.2400, 1.3492, 0.7573, 9.2427, 2.4021, 0.7560,
42.0710, 0.0422, 45.0040, 11.0200, 0.0023, 11.0300, 3.4749, 0.9031,
11.0300, 2.0645, 0.9031, 45.0330, 11.0300, 2.0645, 0.7450])

Epoch 0011 | Training loss 18.370600 | Training R2 0.086359 | Validation loss 20.801422 | Validation R2 -0.065099
Best loss 20.801422 | Best epoch 0012

100%##### 672/672 [01:28:00:00, 7.56it/s]
tensor([6.5970, 11.4671, 10.5759, 11.7271, 9.5237, 9.2793, 9.2502,
0.8100, 10.6249, 0.9077, 6.4109, 10.4517, 0.3311, 5.9003, 9.3900,
5.0092, 0.5600, 6.4435, 3.8113, 7.4316, 5.2236, 2.4744, 6.0502,
4.0339, 2.3123, 0.8004, 4.4167, 2.0192, -0.9629, 0.0474, -3.0528,
-1.1970, -3.4500], grad_fn=IndexBackward0))
tensor([7.5102, 15.6800, 3.1067, 27.9940, 10.3000, 3.4217, 32.5420, 11.7100,
3.4396, 32.5520, 13.2420, 3.4400, 40.3530, 12.2300, 3.5924, 29.4030,
3.6040, 32.6000, 11.7570, 3.4530, 34.0010, 12.2340, 3.5934, 34.0070,
13.8700, 6.6497, 3.6041, 34.1050, 12.2730, 3.6049, 12.2740, 3.6054,
17.7370, 7.5102])

Epoch 0012 | Training loss 17.796364 | Training R2 0.142584 | Validation loss 20.190370 | Validation R2 0.003442
Best loss 20.190370 | Best epoch 0012

100%##### 672/672 [01:29:00:00, 7.55it/s]
tensor([18.1552, 22.1167, 18.2234, 23.1250, 20.6723, 16.5251, 21.2824, 18.8539,
15.4051, 19.8101, 17.8533, 15.0033, 19.0660, 17.3397, 14.4202, 18.4159],
grad_fn=IndexBackward0))
tensor([46.6430, 16.5660, 2.9642, 47.5600, 16.8100, 3.0078, 47.1240, 16.6500,
2.9791, 47.5720, 16.8140, 3.0085, 47.0390, 16.6260, 2.9749, 46.6430])

Epoch 0013 | Training loss 17.672243 | Training R2 0.154502 | Validation loss 20.135670 | Validation R2 0.009020
Best loss 20.135670 | Best epoch 0013

100%##### 672/672 [01:29:00:00, 7.54it/s]
tensor([15.7235, 21.9340, 21.4483, 20.9525, 19.3949, 21.5609, 25.2046, 23.9585,
22.7006, 25.1933, 23.5000, 25.3662, 24.0500, 26.2501, 24.4513, 26.5796,
24.7000, 27.2621, 24.0573, 26.0576, 25.2004], grad_fn=IndexBackward0))
tensor([20.9300, 26.7600, 22.9070, 19.9020, 13.0070, 17.6410, 46.8300, 29.5720,
19.3340, 35.0900, 20.3400, 31.7000, 20.7250, 36.0000, 20.8550, 36.0910,
20.9040, 42.0090, 20.9210, 36.9340, 20.9200])

Epoch 0014 | Training loss 16.964031 | Training R2 0.220911 | Validation loss 19.311337 | Validation R2 0.009050
Best loss 19.311337 | Best epoch 0014

100%##### 672/672 [01:29:00:00, 7.52it/s]
tensor([17.0863, 37.3666, 32.3400, 23.9999, 39.5029, 35.9349, 28.6494, 30.7055,
35.1126, 28.4001, 37.0100, 33.2479, 29.0002, 30.2650, 36.5677, 31.0403,
37.3955, 35.5400, 32.0257, 30.4204, 36.4113, 32.7003],
grad_fn=IndexBackward0))
tensor([6.5237, 74.1600, 27.0270, 6.0009, 78.2140, 29.7730, 6.4050, 78.5910,
29.9300, 6.5212, 78.6230, 29.9500, 6.5243, 6.5245, 63.0010, 6.4075,
64.1270, 29.9090, 6.5146, 78.6170, 29.9510, 6.5237])

Epoch 0015 | Training loss 16.071217 | Training R2 0.300759 | Validation loss 18.356150 | Validation R2 0.176937
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:29:00:00, 7.52it/s]
tensor([16.5277, 46.4004, 39.2700, 27.7244, 45.0794, 40.7100, 32.3501, 44.0510,
38.4710, 30.6690], grad_fn=IndexBackward0))
tensor([3.5346, 75.5620, 25.2660, 3.8933, 65.0520, 23.0200, 4.0963, 64.9500,
19.9220, 4.0935])

Epoch 0016 | Training loss 16.231964 | Training R2 0.206701 | Validation loss 18.394150 | Validation R2 0.173525
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:29:00:00, 7.48it/s]
tensor([5.3319, 17.4150, 16.5360, 15.6327, 11.7102, 0.7342, 5.1355, 2.4099],
grad_fn=IndexBackward0))
tensor([1.0703, 24.1700, 18.6400, 14.5690, 5.5683, 2.7131, 1.0403, 0.5069])

Epoch 0017 | Training loss 16.121244 | Training R2 0.296399 | Validation loss 18.390121 | Validation R2 0.173800
Best loss 18.356150 | Best epoch 0015

100%##### 672/672 [01:31:00:00, 7.34it/s]
tensor([8.2026, 20.0302, 26.2700, 23.0754, 20.0050, 16.5093, 11.9295, 0.6301,
5.4420, 24.6001, 16.0900, 0.5900, 4.0533, 18.9753, 15.0632, 9.7732,
6.4040], grad_fn=IndexBackward0))
tensor([4.0044, 39.7300, 31.0010, 22.1240, 13.5590, 0.3076, 4.4262, 2.7406,
1.6970, 51.6670, 13.3070, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
1.7000])

Epoch 0018 | Training loss 13.867579 | Training R2 0.479369 | Validation loss 15.791674 | Validation R2 0.390047
Best loss 15.791674 | Best epoch 0018

100%##### 672/672 [01:37:00:00, 6.91it/s]
tensor([6.1014e+00, 2.5520e+01, 1.4262e+01, 5.9700e+00, -2.2717e+00,
1.6000e+01, 6.1390e+00, 3.2727e-01, -3.4941e+00, 1.1665e+01,
5.4953e+00, 3.5902e-01, -3.4109e+00, 1.1026e+01, 5.0514e+00,
7.2515e-04, -3.4042e+00], grad_fn=IndexBackward0))
tensor([0.7450, 40.8200, 9.9731, 3.1421, 0.8166, 40.8000, 10.0110, 2.6018,
0.0197, 40.8630, 10.0090, 2.6011, 0.0195, 39.2230, 9.6072, 2.4900,
0.7064])

Epoch 0019 | Training loss 12.710710 | Training R2 0.562610 | Validation loss 14.043241 | Validation R2 0.461020
Best loss 14.043241 | Best epoch 0019

100%##### 672/672 [01:45:00:00, 6.39it/s]
tensor([10.0560, 46.4007, 26.5091, 10.1913, 2.7001, 35.4057, 14.4463, 7.3000,
1.1632], grad_fn=IndexBackward0))
tensor([4.6511, 55.9000, 16.9540, 4.6030, 2.0962, 47.9720, 12.9760, 5.0075,
2.2130])

Epoch 0020 | Training loss 11.812094 | Training R2 0.622269 | Validation loss 13.195599 | Validation R2 0.574660
Best loss 13.195599 | Best epoch 0020

100%##### 672/672 [01:59:00:00, 5.64it/s]
tensor([10.1553, 18.2907, 5.9339, 0.7742, 24.4130, 11.2959, 0.2802, 10.9734,
0.3400, 22.0324, 0.4522, 4.2007, 0.0211, 23.1974, 5.1732, 1.2610,
0.0301, 0.2529, 15.020, 20.7739, 4.9145, 1.9530, 1.5326, 9.5000],
grad_fn=IndexBackward0))
tensor([14.9510, 17.0000, 6.4340, 2.7007, 51.9570, 17.6200, 2.0727, 17.5920,
2.0001, 53.1470, 2.9460, 7.7510, 2.9232, 53.0570, 7.9000, 3.4200,
2.9753, 11.9150, 2.9524, 53.4700, 6.0475, 3.4000, 2.9640, 14.9510])

Epoch 0021 | Training loss 10.502940 | Training R2 0.701350 | Validation loss 11.709469 | Validation R2 0.665077
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:23:00:00, 4.69it/s]
tensor([4.0642, 17.7674, 20.9000, -0.9000], grad_fn=IndexBackward0))
tensor([5.0404, 17.0220, 6.0592, 2.0044])

Epoch 0022 | Training loss 9.577409 | Training R2 0.751672 | Validation loss 12.240973 | Validation R2 0.633903
Best loss 11.709469 | Best epoch 0021

100%##### 672/672 [02:36:00:00, 4.20it/s]
tensor([10.1100, 54.1474, 47.1990, 46.6521, 24.9629, 10.5050, 10.9007, 5.3792,
3.3000], grad_fn=IndexBackward0))
tensor([12.0510, 55.0900, 40.4200, 31.6600, 25.7020, 12.4200, 7.3500, 3.6646,

```
2.1727)]

Epoch 0023 | Training loss 7.726895 | Training R2 0.838364 | Validation loss 9.112268 | Validation R2 0.797174
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:33<00:00, 4.37it/s]
tensor([ 6.9846, 41.2925, 34.4426, 12.2642, 5.9180, 1.2359, -0.0414,
        -0.5284, 38.4061, 9.3305, -0.1065, -1.4874, 31.3701, 6.5284, -1.4669,
        -2.4291, 13.1851, -1.7246, -3.2997], grad_fn=<IndexBackward0>)
tensor([ 4.8044, 39.7300, 22.1240, 13.5590, 8.3876, 4.4262, 2.7406,
        1.6970, 51.6670, 13.3876, 4.3702, 1.6755, 39.7860, 11.6310, 3.7990,
        1.7809, 18.7290, 4.4247, 1.6964])

Epoch 0024 | Training loss 9.422968 | Training R2 0.759617 | Validation loss 9.542447 | Validation R2 0.777572
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [02:46<00:00, 4.04it/s]
tensor([23.6239, 67.3576, 38.3424, 17.5867, 53.2716, 29.3855, 18.8101, 57.4894,
        31.0669, 19.9989, 59.8965], grad_fn=<IndexBackward0>)
tensor([42.1750, 56.1960, 7.7854, 0.4302, 32.9930, 7.7374, 0.4275, 41.1230,
        7.5177, 0.4154, 42.1750])

Epoch 0025 | Training loss 7.962917 | Training R2 0.828338 | Validation loss 9.609860 | Validation R2 0.774418
Best loss 9.112268 | Best epoch 0023

100%##### 672/672 [03:02<00:00, 3.69it/s]
tensor([ 4.8900, 45.6167, 9.5907, 0.1051, -0.9369, 39.9992, 0.5790,
        -0.3131, -1.5515, 39.4073, 0.3105, -0.3392, -2.4984, 37.1281,
        8.8991, -0.9208, -3.5922, 35.8086, 8.4388, -1.9218, -4.8642,
        33.2721, 7.2729, -3.1486, -6.2217, 31.8621, 6.4087, -4.3224,
        -7.4073, 29.4215, 4.9050, -5.7174, -3.7930, 28.9204, 4.0174,
        -6.7392, -9.6808, 7.2845, -6.6397, -10.4594, 26.3385, 1.3159,
        -8.2648, -11.1160, 24.3990, -0.4301, -9.1098, -11.8479, 21.2692,
        -2.0100, -9.9080, -12.4354, 10.3305, 3.3384, -13.0076, -4.2371,
        -11.5662, -13.8299, 17.7920, -14.3870, -4.9450, -12.6202, -15.1504],
grad_fn=<IndexBackward0>)
tensor([ 1.6133, 40.1610, 12.3810, 4.1701, 1.6409, 41.0410, 12.7110, 4.2813,
        1.4846, 42.8210, 13.2600, 4.4680, 1.9581, 41.6500, 12.9060, 4.3470,
        1.7105, 41.2450, 12.7800, 4.3043, 1.6937, 39.8740, 12.3490, 4.1591,
        1.6366, 39.6830, 12.2800, 4.1308, 1.6285, 38.6890, 11.9800, 4.0377,
        1.5808, 39.3970, 12.0200, 4.1090, 1.6171, 16.2800, 4.4939, 1.5810,
        39.7140, 12.3040, 4.1439, 1.6306, 39.4100, 12.2100, 4.1124, 1.6182,
        37.9910, 11.7700, 3.9642, 1.5598, 36.4990, 11.3100, 1.4989, 11.3470,
        3.8219, 1.5038, 39.1180, 1.6059, 12.1740, 4.1001, 1.6133])

Epoch 0026 | Training loss 8.169349 | Training R2 0.819323 | Validation loss 8.430163 | Validation R2 0.826403
Best loss 8.430163 | Best epoch 0026

100%##### 672/672 [03:01<00:00, 3.71it/s]
tensor([ 6.5499, 48.5983, 15.1371, 3.5329], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0027 | Training loss 6.878400 | Training R2 0.871910 | Validation loss 7.949504 | Validation R2 0.845635
Best loss 7.949504 | Best epoch 0027

100%##### 672/672 [02:57<00:00, 3.79it/s]
tensor([22.4853, 65.2800, 29.7620, 19.7173, 17.9791, 57.3077, 28.7129, 17.0198,
        16.7415, 26.9971, 16.9020, 63.2690, 30.2553, 16.8454, 63.8235, 30.3975,
        16.6662, 63.3403], grad_fn=<IndexBackward0>)
tensor([54.4230, 51.9620, 17.0410, 7.0369, 2.5077, 43.8090, 17.6270, 3.0059,
        2.5700, 15.3400, 2.6174, 55.5000, 10.3240, 2.6960, 55.2450, 18.2100,
        2.6800, 54.4230])

Epoch 0028 | Training loss 6.115299 | Training R2 0.898757 | Validation loss 5.728622 | Validation R2 0.919838
Best loss 5.728622 | Best epoch 0028

100%##### 672/672 [02:53<00:00, 3.87it/s]
tensor([ 9.4401, 86.3610, 29.5400, 6.6376, 70.3233, 26.1667, 6.2007, 70.0224,
        24.1587, 6.6242], grad_fn=<IndexBackward0>)
tensor([ 3.5346, 75.5620, 25.2660, 3.8933, 65.0520, 23.0200, 4.0963, 64.9580,
        19.7220, 4.0935])

Epoch 0029 | Training loss 6.373678 | Training R2 0.890021 | Validation loss 7.142794 | Validation R2 0.875375
Best loss 5.728622 | Best epoch 0028

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 5 --model 4 --save fold 5 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:27<00:00, 7.65it/s]
tensor([2.4257, 5.2958, 5.4951], grad_fn=<IndexBackward0>)
tensor([16.0320, 54.3750, 13.4300])

Epoch 0001 | Training loss 25.501337 | Training R2 -0.708577 | Validation loss 32.142315 | Validation R2 -1.523621
Best loss 32.142315 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.68it/s]
tensor([10.9780, 16.4202, 16.4284, 16.4365, 16.4447, 16.4853, 16.5342, 16.5586,
        16.5630, 21.0501, 21.9070, 21.9640, 22.0047], grad_fn=<IndexBackward0>)
tensor([ 1.7195, 93.2850, 73.9070, 63.0300, 53.2360, 26.3850, 11.4810, 7.5733,
        4.9958, 75.1950, 26.0070, 10.1920, 5.0947])

Epoch 0002 | Training loss 25.554596 | Training R2 -0.767938 | Validation loss 33.443009 | Validation R2 -1.732012
Best loss 32.142315 | Best epoch 0001

100%##### 672/672 [01:27<00:00, 7.68it/s]
tensor([ 7.0450, 10.0154, 10.0010, 9.9864], grad_fn=<IndexBackward0>)
tensor([21.4040, 31.6970, 25.8410, 21.4040])

Epoch 0003 | Training loss 24.312588 | Training R2 -0.600264 | Validation loss 32.068600 | Validation R2 -1.512059
Best loss 32.068600 | Best epoch 0003

100%##### 672/672 [01:28<00:00, 7.62it/s]
tensor([ 4.0094, 7.7182, 7.1797, 6.7084, 10.2464, 8.3896, 11.8718, 9.6665,
        13.0503, 10.4877, 11.8137, 10.9202, 11.9601], grad_fn=<IndexBackward0>)
tensor([ 2.5150, 10.0050, 2.5792, 0.0070, 40.4740, 0.0047, 40.4720, 0.0047,
        39.6800, 0.7075, 2.5150, 0.7072, 2.5150])

Epoch 0004 | Training loss 10.267012 | Training R2 0.096633 | Validation loss 19.870958 | Validation R2 0.035488
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.62it/s]
tensor([ 4.0690, 9.7944, 7.0900, 13.1560, 11.7143], grad_fn=<IndexBackward0>)
tensor([12.0470, 12.6800, 1.0025, 53.5960, 12.0470])

Epoch 0005 | Training loss 10.761860 | Training R2 0.047026 | Validation loss 21.200550 | Validation R2 -0.097903
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([21.4091, 24.0509, 32.5703], grad_fn=<IndexBackward0>)
tensor([19.2920, 05.6310, 19.2920])

Epoch 0006 | Training loss 17.982162 | Training R2 0.124507 | Validation loss 20.414364 | Validation R2 -0.017986
Best loss 19.870958 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.60it/s]
tensor([10.0500, 29.9707, 27.4002], grad_fn=<IndexBackward0>)
tensor([13.0520, 68.0710, 23.1030])

Epoch 0007 | Training loss 16.927532 | Training R2 0.224260 | Validation loss 19.159618 | Validation R2 0.103307
Best loss 19.159618 | Best epoch 0007

100%##### 672/672 [01:28<00:00, 7.60it/s]
tensor([17.9655, 34.3102, 30.5375, 23.3251, 34.3692, 29.5117, 18.7665, 22.5027,
        16.5302, 13.3714, 16.2217, 13.3905, 11.9360, 14.2540, 12.4377, 11.5434,
        13.4844, 12.0562], grad_fn=<IndexBackward0>)
tensor([ 7.2463, 70.3400, 22.7700, 3.3003, 60.2640, 24.0900, 3.4903, 24.0210,
        0.4087, 3.4004, 20.9020, 7.4070, 3.5230, 20.0010, 7.3509, 3.4960,
        20.5050, 7.2463])

Epoch 0008 | Training loss 16.370752 | Training R2 0.274452 | Validation loss 18.973333 | Validation R2 0.120659
Best loss 18.973333 | Best epoch 0008

100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([12.1032, 24.9040, 20.0033, 13.0126, 22.6410, 17.7574, 9.1740, 8.4137,
        14.9725, 11.3905, 7.3307, 11.5202, 9.2640, 7.5464, 10.3042, 9.3327,
        7.9904, 10.2717, 7.5509, 8.7520, 10.6169, 10.2095, 9.4622, 11.3097,
        10.0502, 10.0053, 11.4501, 10.0604, 10.3499, 11.0008, 11.2397, 10.5046,
        11.9419, 10.5950, 11.9133, 11.2209, 10.4416, 11.6993, 10.9565, 10.1020,
        11.3339, 10.4162], grad_fn=<IndexBackward0>)
tensor([ 7.3600, 43.7330, 14.9210, 2.7405, 45.0550, 10.0700, 3.8155, 2.9446,
        46.1300, 18.1450, 2.9560, 46.7250, 14.1700, 2.9953, 45.9950, 15.9060,
        2.9515, 45.0260, 15.7550, 2.9235, 46.3120, 16.0030, 2.9695, 46.4360,
        16.0330, 2.9750, 20.4610, 7.2470, 2.9262, 12.0770, 0.4900, 2.0144,
        20.5900, 2.9440, 20.6570, 0.3205, 2.9543, 20.5540, 0.2870, 2.9396,
        20.0050, 7.3600])

Epoch 0009 | Training loss 14.815959 | Training R2 0.405723 | Validation loss 16.785484 | Validation R2 0.311764
Best loss 16.785484 | Best epoch 0009

100%##### 672/672 [01:28<00:00, 7.56it/s]
tensor([15.2201, 37.9792, 30.4121, 22.7532, 16.1195, 34.4007, 22.6515],
grad_fn=<IndexBackward0>)
```

```
tensor([15.0620, 56.9590, 15.1310, 4.2726, 1.4454, 56.5590, 15.0620])

Epoch 0010 | Training loss 14.673149 | Training R2 0.417125 | Validation loss 16.793373 | Validation R2 0.311117
Best loss 16.785484 | Best epoch 0009

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([12.6404, 24.5527, 16.1193, 8.5453, 18.2315, 13.3730, 8.7617],
grad_fn=IndexBackward0)
tensor([23.5920, 20.2570, 2.7573, 21.0380, 2.8637, 70.1770, 21.0260, 2.8620])

Epoch 0011 | Training loss 13.782256 | Training R2 0.485755 | Validation loss 15.996996 | Validation R2 0.374904
Best loss 15.996996 | Best epoch 0011

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([ 4.0908, 27.8276, 26.2090, 24.5929, 18.1533, 13.3494, 7.2182, 3.3814,
21.8690, 13.4962, 8.6837], grad_fn=IndexBackward0)
tensor([ 0.4137, 29.3630, 22.5580, 17.5020, 6.4361, 3.0432, 1.1209, 0.2506,
39.4790, 6.4477, 1.1231])

Epoch 0012 | Training loss 13.383948 | Training R2 0.520829 | Validation loss 15.555521 | Validation R2 0.408930
Best loss 15.555521 | Best epoch 0012

100%##### 672/672 [01:29<00:00, 7.47it/s]
tensor([ 9.7279, 22.9570, 31.1551, 27.5726, 20.4980, 15.2656, 8.3477, 2.3601,
19.6387, 10.3360, 5.2515, 2.0294, 14.1004, 8.3174, 4.3076, 1.9895,
11.4774, 8.7051, 4.2783, 3.9683, 10.1290, 7.9084, 6.9519, 5.8924,
11.1614, 9.8574, 5.5019, 7.2632, 12.1099, 10.4080, 9.4548, 8.2704,
12.6488, 11.3100, 9.9475, 8.7581, 12.5870, 11.5066],
grad_fn=IndexBackward0)
tensor([12.5050, 42.0500, 34.8410, 24.5230, 12.4040, 7.4420, 3.7659, 1.3563,
42.1990, 12.2400, 3.7197, 1.3393, 42.1710, 12.2410, 3.7175, 1.3305,
43.0630, 20.8330, 1.9210, 1.3667, 43.0860, 8.8969, 3.7979, 1.3674,
42.5380, 12.3470, 3.7496, 1.3500, 42.9850, 10.5230, 3.7888, 1.3642,
43.0040, 12.5050, 3.7977, 1.3674, 43.0040, 12.5050])

Epoch 0013 | Training loss 13.012312 | Training R2 0.541607 | Validation loss 15.213802 | Validation R2 0.436413
Best loss 15.213802 | Best epoch 0013

100%##### 672/672 [01:29<00:00, 7.40it/s]
tensor([ 0.2745, 10.0347, 2.2603, -0.2085, -0.0719, 8.2394, 3.7114, 1.4496,
1.0090, 8.3221, 2.2000, 2.6109, 2.3726, 7.1274, 5.6220, 4.6610,
4.4669, 8.3041, 7.0924, 5.9960, 5.8123, 9.2077, 7.8543, 6.7494,
10.1614, 8.6661, 7.3556, 10.6087, 8.6601, 7.7160, 10.9804, 9.1611,
7.9901, 11.2231, 1.1500, 8.1591, 11.2712, 9.3742],
grad_fn=IndexBackward0)
tensor([ 5.3290, 14.0900, 5.0763, 2.4483, 2.1161, 14.7070, 5.2903, 2.5554,
2.2086, 14.9430, 5.3834, 2.5964, 2.2441, 12.6700, 5.2850, 2.5490,
2.2031, 16.6080, 5.9015, 2.4934, 2.1551, 16.9430, 5.2700, 2.1909,
19.6280, 6.1089, 2.2010, 19.5260, 4.5390, 2.1095, 19.9300, 5.3619,
2.2351, 20.0550, 4.6626, 2.2488, 19.8140, 5.3290])

Epoch 0014 | Training loss 12.533939 | Training R2 0.574691 | Validation loss 14.716722 | Validation R2 0.470956
Best loss 14.716722 | Best epoch 0014

100%##### 672/672 [01:30<00:00, 7.44it/s]
tensor([ 6.7641, 18.5630, 6.5979, 23.9049, 15.6916], grad_fn=IndexBackward0)
tensor([12.8470, 12.6800, 1.0025, 53.5960, 12.8470])

Epoch 0015 | Training loss 12.104251 | Training R2 0.603352 | Validation loss 14.334991 | Validation R2 0.490045
Best loss 14.334991 | Best epoch 0015

100%##### 672/672 [01:30<00:00, 7.40it/s]
tensor([13.7995, 46.5063, 19.0063, 4.8340, 29.5911, 16.0146, 4.0011, 21.8330,
12.8681, 4.3595], grad_fn=IndexBackward0)
tensor([14.8340, 52.5400, 13.3600, 1.0996, 54.8650, 14.0150, 1.9913, 37.1760,
11.8580, 1.9824])

Epoch 0016 | Training loss 11.550217 | Training R2 0.630832 | Validation loss 13.747127 | Validation R2 0.530370
Best loss 13.747127 | Best epoch 0016

100%##### 672/672 [01:31<00:00, 7.34it/s]
tensor([ 4.0921, 18.3844, 3.6786, 16.8184, 5.1207, 14.0996, 5.4195, 14.2547,
6.1746, 13.5347, 6.7133, 14.0622, 10.0545, 7.3026, 10.5945, 8.0517,
11.2127, 8.0817, 15.2600, 11.8977, 9.8144, 12.7052, 10.7657, 13.3170,
11.0920, 11.6402, 14.4510, 12.6066, 15.4900, 13.4973],
grad_fn=IndexBackward0)
tensor([ 2.9329, 10.1390, 2.0114, 19.1000, 2.9610, 16.6620, 2.9542, 19.3020,
2.9922, 19.2630, 2.9601, 19.0600, 7.4900, 2.9500, 7.4013, 2.9491,
7.4269, 2.9277, 19.0190, 7.4794, 2.9484, 7.5152, 2.9625, 6.4910,
3.3380, 2.9231, 7.5180, 2.9639, 7.4401, 2.9329])

Epoch 0017 | Training loss 11.009778 | Training R2 0.667053 | Validation loss 13.340640 | Validation R2 0.565266
Best loss 13.340640 | Best epoch 0017

100%##### 672/672 [01:32<00:00, 7.29it/s]
tensor([16.4245, 59.1090, 21.8300], grad_fn=IndexBackward0)
tensor([13.8520, 60.8710, 23.1830])

Epoch 0018 | Training loss 10.320528 | Training R2 0.711641 | Validation loss 11.873363 | Validation R2 0.655636
Best loss 11.873363 | Best epoch 0018

100%##### 672/672 [01:33<00:00, 7.19it/s]
tensor([17.6073, 63.8990, 24.1650, 5.6614, 44.2576, 22.5470, 6.5664],
grad_fn=IndexBackward0)
tensor([17.6690, 69.9310, 19.6240, 2.0229, 70.4890, 19.8330, 2.0444])

Epoch 0019 | Training loss 9.479305 | Training R2 0.756734 | Validation loss 11.307576 | Validation R2 0.607673
Best loss 11.307576 | Best epoch 0019

100%##### 672/672 [01:35<00:00, 7.03it/s]
tensor([22.7205, 66.0940, 26.8023, 15.5020], grad_fn=IndexBackward0)
tensor([40.1440, 50.7900, 7.5200, 1.1600])

Epoch 0020 | Training loss 8.340364 | Training R2 0.811679 | Validation loss 8.864090 | Validation R2 0.800037
Best loss 8.864090 | Best epoch 0020

100%##### 672/672 [01:39<00:00, 6.74it/s]
tensor([10.0021, 26.9367, 20.0400, 17.0122, 11.5361, 15.0813, 36.3300, 25.5900,
17.7422, 30.3600, 18.7054, 27.2397, 19.3500, 30.3200, 19.6491],
grad_fn=IndexBackward0)
tensor([20.9330, 26.7620, 22.9070, 19.9020, 13.0070, 17.6410, 46.8390, 29.5720,
19.3340, 35.8900, 20.3400, 31.7000, 20.7250, 36.0000, 20.8500])

Epoch 0021 | Training loss 7.650942 | Training R2 0.841526 | Validation loss 8.756156 | Validation R2 0.812710
Best loss 8.756156 | Best epoch 0021

100%##### 672/672 [01:45<00:00, 6.39it/s]
tensor([ 3.7506, 33.9919, 8.2549, 1.2967, -1.8662, -2.1911, 12.2417, 1.5200,
-1.5005, -1.0975, 11.5770, 2.3445, -1.2041, -1.4602],
grad_fn=IndexBackward0)
tensor([ 0.4160, 30.0910, 7.1603, 1.7707, 0.4414, 0.3499, 11.5000, 1.7944,
0.4453, 0.3530, 10.8300, 2.1303, 0.4190, 0.3222])

Epoch 0022 | Training loss 6.915258 | Training R2 0.870537 | Validation loss 6.880650 | Validation R2 0.804005
Best loss 6.880650 | Best epoch 0022

100%##### 672/672 [01:57<00:00, 5.71it/s]
tensor([ 1.5390, 4.4927, 3.3400, 2.5443, 1.9090, 0.1433, -0.4094, -0.6202,
-0.0513, -0.0544, -0.0599, -0.0619, -0.3231, -0.5211, -0.5400, 2.0710,
0.0129, -0.4279, -0.4479], grad_fn=IndexBackward0)
tensor([0.1027, 4.3675, 3.3207, 2.6709, 2.2190, 1.1100, 0.6726, 0.3426, 0.2066,
0.1245, 4.4427, 1.1442, 0.8164, 0.3513, 0.1277, 4.4450, 1.1451, 0.3516,
0.1270])

Epoch 0023 | Training loss 6.409317 | Training R2 0.880700 | Validation loss 6.464074 | Validation R2 0.897900
Best loss 6.464074 | Best epoch 0023

100%##### 672/672 [02:15<00:00, 4.94it/s]
tensor([ 9.2943, 67.5940, 20.8247, 3.1299, 21.1432, 4.3623, 20.0246, 4.6365,
21.1392, 5.1036], grad_fn=IndexBackward0)
tensor([ 2.0309, 55.6560, 16.1950, 2.1095, 15.9100, 2.1521, 15.2060, 2.0559,
15.0010, 2.0309])

Epoch 0024 | Training loss 6.434066 | Training R2 0.887099 | Validation loss 6.995244 | Validation R2 0.880470
Best loss 6.464074 | Best epoch 0023

100%##### 672/672 [02:24<00:00, 4.66it/s]
tensor([ 7.0000, 75.9345, 57.3135, 47.6540, 39.5210, 14.2651, 2.0937, -0.6304,
-2.3179, 56.9519, 15.1300, 2.2615, -1.0004, 57.1460, 16.1390, 3.2200,
0.1911], grad_fn=IndexBackward0)
tensor([ 1.7195, 93.2850, 73.9670, 62.0050, 53.2360, 26.3800, 11.4010, 7.5733,
4.9950, 75.1950, 26.9070, 10.1920, 5.0947, 73.8930, 26.4440, 10.0160,
5.0009])

Epoch 0025 | Training loss 6.013347 | Training R2 0.902105 | Validation loss 6.196391 | Validation R2 0.906212
Best loss 6.196391 | Best epoch 0025

100%##### 672/672 [02:27<00:00, 4.54it/s]
tensor([24.2445, 61.1039], grad_fn=IndexBackward0)
tensor([47.8150, 46.0300])

Epoch 0026 | Training loss 6.441009 | Training R2 0.807000 | Validation loss 5.943230 | Validation R2 0.913719
Best loss 5.943230 | Best epoch 0026

100%##### 672/672 [02:34<00:00, 4.36it/s]
tensor([20.4664, 65.3007, 21.7751], grad_fn=IndexBackward0)
tensor([20.4630, 67.5770, 24.1020])

Epoch 0027 | Training loss 6.147571 | Training R2 0.897000 | Validation loss 5.676152 | Validation R2 0.921299
Best loss 5.676152 | Best epoch 0027

100%##### 672/672 [02:32<00:00, 4.40it/s]
tensor([ 5.5000, 51.0624, 13.1392, 2.6100], grad_fn=IndexBackward0)
tensor([ 1.4420, 52.0970, 9.8000, 1.9520])

Epoch 0028 | Training loss 6.355262 | Training R2 0.890656 | Validation loss 5.830716 | Validation R2 0.916727
Best loss 5.676152 | Best epoch 0027

100%##### 672/672 [02:34<00:00, 4.36it/s]
```



```
tensor([10.5076, 63.3576, 17.9138, 3.0357, 61.1687, 18.1363, 3.4611, 61.1664,
        17.9986, 5.9321, 3.2432], grad_fn=<IndexBackward0>)
tensor([ 7.3120, 60.1970, 18.1710, 3.1501, 62.8600, 19.0200, 3.2978, 62.7360,
        19.2460, 7.4859, 3.3578])

Epoch 0029 | Training loss 6.041739 | Training R2 0.901178 | Validation loss 5.606994 | Validation R2 0.923206
Best loss 5.606994 | Best epoch 0029

/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:36: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.1
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:40: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.2
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/data_split.py:44: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
df["PTNM"] = df["PTNM"] + 0.3
/Users/rishabhgoel/Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py
Desktop/NeuralODE_Paper_Supplementary_Code/5fold_models/Neural-ODE/run_train.py --fold 5 --model 5 --save fold_5 --lr 0.00005 --tol 1e-4 --epochs 30 --l2 0.1
100%##### 672/672 [01:28<00:00, 7.57it/s]
tensor([2.4484, 4.2480, 4.2779, 4.3673, 5.9840, 6.0726, 6.1612, 7.7987, 7.8873,
        7.9444, 9.5586], grad_fn=<IndexBackward0>)
tensor([46.2230, 25.8570, 22.3620, 14.7790, 49.8490, 30.4130, 20.1220, 45.1010,
        29.2020, 22.1960, 46.2230])

Epoch 0001 | Training loss 25.574455 | Training R2 -0.770688 | Validation loss 32.248924 | Validation R2 -1.540390
Best loss 32.248924 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([ 6.8719, 11.2345, 11.2490, 11.2636, 11.3365, 11.3802, 11.4385, 11.5260,
        15.8160, 15.9035, 16.0055, 16.1075, 20.4351, 20.5371, 20.6391],
        grad_fn=<IndexBackward0>)
tensor([ 4.2077, 59.4320, 46.9050, 38.1280, 14.2580, 7.9220, 3.6186, 1.1171,
        59.4890, 17.3990, 4.4157, 1.1207, 17.1950, 4.3640, 1.1075])

Epoch 0002 | Training loss 25.707258 | Training R2 -0.789125 | Validation loss 33.621529 | Validation R2 -1.761244
Best loss 32.248924 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([ 8.7414, 12.7972, 12.7764, 12.7377, 16.7811, 16.7605, 16.7220, 20.7506,
        20.7380, 20.6916, 24.7862, 24.6826, 24.6471], grad_fn=<IndexBackward0>)
tensor([22.8050, 73.4140, 23.4800, 3.5402, 76.4500, 24.6100, 3.7189, 76.3100,
        24.5840, 3.7138, 76.0510, 21.1850, 3.7013])

Epoch 0003 | Training loss 24.660880 | Training R2 -0.647137 | Validation loss 32.497631 | Validation R2 -1.579724
Best loss 32.248924 | Best epoch 0001

100%##### 672/672 [01:28<00:00, 7.61it/s]
tensor([10.6754, 24.8400, 24.5839, 14.8060, 18.2210, 17.9052, 27.4100, 21.2452,
        20.9197, 20.6395, 24.4369, 24.0012, 23.8262, 27.5497, 27.1639, 26.8073,
        30.5101, 30.0944], grad_fn=<IndexBackward0>)
tensor([ 7.2463, 70.3430, 7.7700, 3.3003, 60.2640, 24.0900, 3.4903, 24.0210,
        6.4807, 3.4004, 20.9620, 7.4078, 3.5238, 20.0010, 7.3509, 3.4968,
        20.5050, 7.2463])

Epoch 0004 | Training loss 20.829603 | Training R2 -0.174603 | Validation loss 25.828514 | Validation R2 -0.629554
Best loss 25.828514 | Best epoch 0004

100%##### 672/672 [01:28<00:00, 7.55it/s]
tensor([16.2147, 21.5864, 21.4826, 21.3707, 21.2745, 20.9608, 26.1750, 25.9152,
        25.3930, 30.5795, 30.1107, 29.6397, 33.4538, 38.3805, 37.3363, 41.9564,
        40.7835, 45.0146, 43.9732, 40.4566, 47.3050, 51.7060, 50.1450, 54.3377,
        52.9737, 56.7800, 55.3001, 59.0653, 67.4837], grad_fn=<IndexBackward0>)
tensor([20.7140, 46.6930, 36.3750, 29.6610, 24.7630, 15.1220, 59.5840, 39.0430,
        20.0970, 63.5550, 35.3100, 21.6070, 21.4910, 52.0110, 22.1900, 50.6250,
        21.4590, 41.1430, 21.2610, 42.0590, 22.1220, 43.3930, 22.4000, 41.0020,
        21.2290, 40.3330, 20.8420, 40.0930, 20.7140])

Epoch 0005 | Training loss 17.920030 | Training R2 0.130549 | Validation loss 19.372255 | Validation R2 0.083293
Best loss 19.372255 | Best epoch 0005

100%##### 672/672 [01:28<00:00, 7.55it/s]
tensor([12.9200, 20.2510, 19.2012, 18.1340], grad_fn=<IndexBackward0>)
tensor([ 2.7552, 54.7350, 20.0070, 7.1519])

Epoch 0006 | Training loss 17.330100 | Training R2 0.106923 | Validation loss 18.413456 | Validation R2 0.171790
Best loss 18.413456 | Best epoch 0006

100%##### 672/672 [01:28<00:00, 7.55it/s]
tensor([20.7437, 34.6813, 34.4258, 34.1697, 33.6561, 32.8820, 32.1033, 31.0576,
        30.2675], grad_fn=<IndexBackward0>)
tensor([10.7920, 67.0230, 50.2400, 40.4590, 28.0060, 18.4230, 11.9000, 6.6646,
        4.3127])

Epoch 0007 | Training loss 16.079265 | Training R2 0.228677 | Validation loss 18.103533 | Validation R2 0.199435
Best loss 18.103533 | Best epoch 0007

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([13.7120, 30.2793, 27.5493, 22.4009, 31.3710, 27.1914, 21.9170, 20.8564,
        24.0772, 16.4344], grad_fn=<IndexBackward0>)
tensor([ 2.0712, 67.0250, 19.0140, 2.0747, 60.3840, 14.5370, 2.6447, 1.8009,
        16.9540, 1.8498])

Epoch 0008 | Training loss 16.206800 | Training R2 0.281067 | Validation loss 17.065025 | Validation R2 0.220390
Best loss 17.065025 | Best epoch 0008

100%##### 672/672 [01:29<00:00, 7.54it/s]
tensor([ 8.4000, 23.1501, 19.7200, 16.2299], grad_fn=<IndexBackward0>)
tensor([ 3.1494, 45.2250, 11.2040, 2.9028])

Epoch 0009 | Training loss 15.591856 | Training R2 0.341050 | Validation loss 17.282658 | Validation R2 0.270390
Best loss 17.282658 | Best epoch 0009

100%##### 672/672 [01:29<00:00, 7.52it/s]
tensor([ 0.9627, 7.5078, 7.0403, 6.5002, 3.0039, 2.1405, 0.2473, -0.6598,
        -1.2493, 3.6337, 1.0009, 1.0659, 0.5340, 3.1000, 2.5651, 2.0258,
        1.4292], grad_fn=<IndexBackward0>)
tensor([ 0.2632, 13.4210, 9.5364, 7.0612, 1.7695, 0.7790, 0.2609, 0.1149,
        0.0506, 13.0570, 1.7257, 0.2544, 0.0493, 13.2040, 1.7452, 0.2573,
        0.0499])

Epoch 0010 | Training loss 14.974828 | Training R2 0.392910 | Validation loss 16.909748 | Validation R2 0.301536
Best loss 16.909748 | Best epoch 0010

100%##### 672/672 [01:29<00:00, 7.50it/s]
tensor([12.9711, 42.1341, 35.1707, 19.0216, 31.2690, 15.0300, 21.2704, 13.9399],
        grad_fn=<IndexBackward0>)
tensor([ 1.5969, 60.9360, 20.1160, 1.3031, 20.2650, 1.3127, 20.2740, 1.5969])

Epoch 0011 | Training loss 14.465054 | Training R2 0.433540 | Validation loss 16.540763 | Validation R2 0.331039
Best loss 16.540763 | Best epoch 0011

100%##### 672/672 [01:30<00:00, 7.45it/s]
tensor([ 0.0758, 2.3092, 0.0758, 0.9163, 0.4903, -1.7637, -2.4307, -2.9047,
        -3.1434], grad_fn=<IndexBackward0>)
tensor([0.0492, 6.6725, 4.1326, 3.1690, 1.9529, 0.9650, 0.4770, 0.1072, 0.0927])

Epoch 0012 | Training loss 13.845372 | Training R2 0.401035 | Validation loss 15.948096 | Validation R2 0.370657
Best loss 15.948096 | Best epoch 0012

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([ 9.3530, 21.3644, 11.0038, 7.0150, 20.0011, 13.9052, 7.4559, 11.5265,
        7.7076, 13.3320, 8.3271, 9.8427, 9.4540, 12.3430, 11.0543, 10.6271,
        10.5572, 12.2739, 11.4969, 14.0402, 12.0231, 12.4112, 12.3001, 13.7474],
        grad_fn=<IndexBackward0>)
tensor([14.9510, 17.0060, 6.4340, 2.7057, 51.9570, 17.6200, 2.0727, 17.5920,
        2.0601, 53.1470, 6.7516, 5.0600, 2.9232, 53.0570, 7.9009, 6.4200,
        2.9753, 11.9150, 2.9524, 53.4760, 6.0475, 3.4006, 2.9640, 14.9510])

Epoch 0013 | Training loss 13.343073 | Training R2 0.517949 | Validation loss 15.780548 | Validation R2 0.391000
Best loss 15.780548 | Best epoch 0013

100%##### 672/672 [01:30<00:00, 7.41it/s]
tensor([ 6.1340, 15.3637, 6.1340, 15.9000, 10.0500, 5.5472, 13.0540, 9.6103,
        6.1307, 11.4650, 9.0124, 7.1509], grad_fn=<IndexBackward0>)
tensor([ 9.0032, 9.6259, 0.6303, 43.0570, 9.7042, 0.6435, 44.0790, 9.7534,
        0.6467, 44.4320, 9.8362, 0.6522])

Epoch 0014 | Training loss 12.061094 | Training R2 0.552199 | Validation loss 15.110623 | Validation R2 0.441666
Best loss 15.110623 | Best epoch 0014

100%##### 672/672 [01:30<00:00, 7.39it/s]
tensor([10.6163, 26.0054, 24.9020, 23.1042, 21.2513, 15.0637, 27.0975, 22.9511,
        17.0039, 20.4169, 10.7019, 26.0114, 19.3790, 26.7333, 10.6195, 25.7249,
        17.9570], grad_fn=<IndexBackward0>)
tensor([21.3340, 19.2610, 14.4950, 11.2260, 0.9505, 5.3001, 10.6970, 12.5000,
        0.2546, 26.5910, 10.1260, 20.1900, 11.3250, 29.3320, 12.1200, 30.0900,
        12.6440])

Epoch 0015 | Training loss 12.244040 | Training R2 0.594138 | Validation loss 14.150057 | Validation R2 0.510490
Best loss 14.150057 | Best epoch 0015

100%##### 672/672 [01:31<00:00, 7.33it/s]
tensor([12.0120, 47.7913, 21.1900, 0.6700, 30.4371, 17.4120, 3.3207, 26.1706,
        14.0149, 3.9932, 22.5600, 15.0000, 5.3215, 4.0010, 16.4523, 6.9937,
        0.0652, 0.5227, 7.5022, 17.7124, 9.9420, 0.0900, 10.0299, 11.2369,
        21.0405, 10.0739, 13.2249, 22.0230, 20.1404, 14.9044, 24.0042, 21.0666,
        16.0032, 25.3697, 23.4747, 10.6334, 25.0639, 23.3005, 20.2449, 27.4377,
        25.0003, 21.9271, 20.9922, 23.5620, 27.0001], grad_fn=<IndexBackward0>)
tensor([ 9.0460, 54.6540, 20.0790, 3.7009, 57.0700, 21.1030, 3.9042, 56.9020,
```

```
21.1180, 3.9872, 57.0060, 21.1240, 4.5338, 3.9882, 27.3110, 5.1542,
3.9883, 5.1542, 3.9883, 31.0680, 5.1532, 3.9875, 32.2750, 4.1424,
59.3510, 21.9960, 4.1529, 58.5410, 21.6980, 4.0967, 60.0390, 22.2400,
4.2004, 59.9030, 22.2010, 4.1916, 32.2840, 13.1400, 4.1436, 32.6290,
13.2800, 4.1878, 32.6930, 4.1960, 9.0468]]

Epoch 0016 | Training loss 12.546910 | Training R2 0.573810 | Validation loss 16.446472 | Validation R2 0.339283
Best loss 14.156057 | Best epoch 0015

100%#####| 672/672 [01:32<00:00, 7.26it/s]
tensor([25.2400, 63.0524, 30.0123, 18.4202], grad_fn=<IndexBackward0>)
tensor([48.1440, 50.7900, 7.5206, 1.1606])

Epoch 0017 | Training loss 11.841760 | Training R2 0.620369 | Validation loss 13.399882 | Validation R2 0.561397
Best loss 13.399882 | Best epoch 0017

100%#####| 672/672 [01:33<00:00, 7.17it/s]
tensor([ 3.7582, 17.1202, 2.3787, 24.3760, 13.3095, 2.2700, 17.5527, 9.0142,
1.3517, 14.9198, 8.1555, 1.1716, 7.7569, 1.2899, 1.5562, 7.3537,
1.0437, 13.5366, 7.3543, 2.0025, 8.0452, 2.6267, 2.3807, 8.1799,
2.7442, 3.1212, 13.1203, 8.7356, 3.4417], grad_fn=<IndexBackward0>)
tensor([ 1.7265, 18.3160, 2.4943, 49.3870, 15.7180, 2.1405, 40.9940, 12.9500,
1.7635, 40.5800, 12.8600, 1.7524, 12.6860, 1.7275, 1.7280, 12.6780,
1.7266, 39.0550, 12.6700, 1.7265, 14.7770, 2.0123, 1.7262, 14.7770,
1.7262, 1.7262, 39.0540, 14.7800, 1.7265])

Epoch 0018 | Training loss 9.960076 | Training R2 0.731389 | Validation loss 11.356238 | Validation R2 0.604979
Best loss 11.356238 | Best epoch 0018

100%#####| 672/672 [01:35<00:00, 7.03it/s]
tensor([ 3.4073, 21.7651, 2.4040, 1.7430, 22.0736, 2.8500, 19.3220, 3.0220],
grad_fn=<IndexBackward0>)
tensor([ 3.7309, 20.7410, 4.1518, 3.6310, 21.9260, 3.8384, 21.3500, 3.7377])

Epoch 0019 | Training loss 9.017970 | Training R2 0.779836 | Validation loss 10.003691 | Validation R2 0.755550
Best loss 10.003691 | Best epoch 0019

100%#####| 672/672 [01:38<00:00, 6.80it/s]
tensor([ 3.9709, 21.9546, 2.3444, 18.1305, 3.7273], grad_fn=<IndexBackward0>)
tensor([ 1.9136, 20.0690, 1.9223, 15.1660, 1.9866])

Epoch 0020 | Training loss 8.921117 | Training R2 0.784540 | Validation loss 10.963613 | Validation R2 0.706386
Best loss 10.003691 | Best epoch 0019

100%#####| 672/672 [01:44<00:00, 6.44it/s]
tensor([ 6.2324, 42.5617, 34.4039, 30.1060, 17.3074, 10.6950, 4.7618, 1.7787,
-0.3446, 44.9082, 17.6935, 5.0156], grad_fn=<IndexBackward0>)
tensor([ 2.0054, 42.0900, 34.5060, 27.9040, 12.2340, 6.5023, 2.0006, 1.5499,
0.8339, 54.9410, 12.2540, 2.0054])

Epoch 0021 | Training loss 7.610228 | Training R2 0.843208 | Validation loss 7.832873 | Validation R2 0.850131
Best loss 7.832873 | Best epoch 0021

100%#####| 672/672 [01:57<00:00, 5.72it/s]
tensor([ 0.0888, 12.1520, 1.4148, -1.9840], grad_fn=<IndexBackward0>)
tensor([ 1.4236, 14.5010, 4.3771, 1.0603])

Epoch 0022 | Training loss 6.943378 | Training R2 0.869482 | Validation loss 7.526657 | Validation R2 0.861620
Best loss 7.526657 | Best epoch 0022

100%#####| 672/672 [02:13<00:00, 5.05it/s]
tensor([ 9.7984, 18.7175, 7.9693, 4.5303, 43.3811, 19.0467, 13.2996, 8.7738,
5.3788, 19.4652, 9.1706, 5.0376], grad_fn=<IndexBackward0>)
tensor([17.2550, 16.0050, 5.5696, 2.1036, 63.8670, 17.2450, 10.7900, 5.7840,
2.2677, 17.4600, 5.0590, 2.2971])

Epoch 0023 | Training loss 6.063361 | Training R2 0.872473 | Validation loss 7.845010 | Validation R2 0.849666
Best loss 7.526657 | Best epoch 0022

100%#####| 672/672 [02:20<00:00, 4.78it/s]
tensor([13.9296, 50.0027, 14.2701], grad_fn=<IndexBackward0>)
tensor([10.0940, 23.60, 13.4640])

Epoch 0024 | Training loss 6.259858 | Training R2 0.893914 | Validation loss 6.466238 | Validation R2 0.897865
Best loss 6.466238 | Best epoch 0024

100%#####| 672/672 [02:25<00:00, 4.61it/s]
tensor([ 5.0430, 19.6714, 16.3084, 13.6462, 7.7119, 27.7933, 16.9001, 9.0960,
20.9267, 17.5417, 10.3755, 10.5065, 10.6070, 12.6079],
grad_fn=<IndexBackward0>)
tensor([ 9.5916, 17.5620, 13.7000, 11.0450, 6.0491, 20.0040, 13.4860, 7.4104,
20.4930, 13.0100, 7.5943, 7.6922, 7.0397, 9.5916])

Epoch 0025 | Training loss 6.173162 | Training R2 0.896032 | Validation loss 5.846045 | Validation R2 0.916518
Best loss 5.846045 | Best epoch 0025

100%#####| 672/672 [02:28<00:00, 4.53it/s]
tensor([26.9313, 60.0050, 27.3174, 17.6704, 14.2293, 52.9944, 27.5900, 14.0336,
14.7004, 25.4410, 14.0904, 62.6600, 20.1100, 14.0701, 62.9070, 27.7113,
14.6070, 62.0197], grad_fn=<IndexBackward0>)
tensor([54.4230, 51.9620, 17.0410, 7.0369, 2.5077, 43.0090, 17.6270, 3.0059,
2.5940, 15.3400, 2.6174, 55.5000, 10.3240, 2.6960, 55.2450, 10.2100,
2.6006, 54.4230])

Epoch 0026 | Training loss 6.230023 | Training R2 0.894096 | Validation loss 5.759395 | Validation R2 0.910974
Best loss 5.759395 | Best epoch 0026

100%#####| 672/672 [02:31<00:00, 4.45it/s]
tensor([ 8.7005, 41.4002, 11.0100, 1.9193, 37.0620, 13.6592, 2.0040, 2.7431,
37.0419, 13.0040, 3.0003], grad_fn=<IndexBackward0>)
tensor([ 7.3680, 43.7320, 14.9210, 2.7605, 45.9550, 10.0700, 3.0155, 2.9446,
46.1300, 10.1450, 2.9500])

Epoch 0027 | Training loss 5.820085 | Training R2 0.908277 | Validation loss 5.586363 | Validation R2 0.923770
Best loss 5.586363 | Best epoch 0027

100%#####| 672/672 [02:31<00:00, 4.44it/s]
tensor([10.6622, 50.0032, 45.5674, 30.3795, 32.1504, 10.5047, 66.5027, 40.5411,
23.0907, 70.0904, 43.0906, 25.1775, 24.7224, 61.0420, 25.0000, 59.9030,
24.7325], grad_fn=<IndexBackward0>)
tensor([20.7140, 46.6930, 36.3750, 29.6610, 24.7630, 15.1220, 59.5040, 39.0430,
20.0970, 63.5550, 35.3100, 21.6070, 21.4910, 52.0110, 22.1900, 50.6250,
21.6590])

Epoch 0028 | Training loss 5.790050 | Training R2 0.909215 | Validation loss 5.422966 | Validation R2 0.928164
Best loss 5.422966 | Best epoch 0028

100%#####| 672/672 [02:32<00:00, 4.40it/s]
tensor([17.9213, 91.0541, 30.2644], grad_fn=<IndexBackward0>)
tensor([19.2920, 85.6310, 19.2920])

Epoch 0029 | Training loss 5.716706 | Training R2 0.911522 | Validation loss 5.752234 | Validation R2 0.919176
Best loss 5.422966 | Best epoch 0028

(base) rishabhgoel@GenIEs-MacBook-Pro ~ % PNowor
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