Linescale 3 Automatic Max/Graph Maker

The purpose of this script is to take the many csv files that the linescale has from recording a specific session, add them to one big table from the day (with timestamps), find the min/max of each, and graph all of them.

One current drawback is that all the files in the single DF must be the same HZ. Will update with a solution.

1) Importing the Data and Assigning to an Array

In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from os import listdir
from os.path import isfile, join
import os
import time
import xlwt
from xlwt.Workbook import *
from pandas import ExcelWriter
import xlsxwriter

%matplotlib inline
```

In [2]:
```
# Make list of all filenames in directory

filenames = [f for f in listdir("/Users/refuc/Linescale 3 Automation") # Change directo
             if isfile(join("/Users/refuc/Linescale 3 Automation", f))]

# Make dataframe from list
timestamp_files = pd.DataFrame(filenames)

# Show Header
timestamp_files.head()
```

Out[2]:

	0
0	10_12_53.CSV
1	10_13_50.CSV
2	10_15_02.CSV
3	10_16_26.CSV
4	10_17_16.CSV

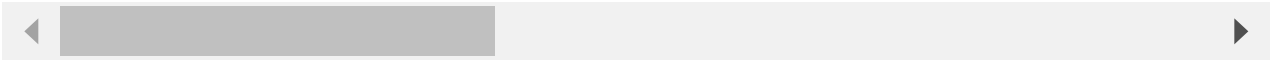
In [3]:
```
# Make master dataframe with all measurements

df = pd.read_csv(filenames[0])
for i in range(len(filenames)-2):
    i = i + 1
    df2 = pd.read_csv(filenames[i])
```

```
    df2.columns[0]
    df[df2.columns[0]] = df2

df.head(10)
```

Out[3]:

	No.1	No.2	No.3	No.4	No.5	No.6	No.8	
0	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13
1	10:12:53	10:13:50	10:15:02	10:16:26	10:17:16	10:17:54	10:19:03	10
2	Speed=40Hz	Speed=40Hz	Speed=40Hz	Speed=40Hz	Speed=40Hz	Speed=40Hz	Speed=40Hz	Speed
3	Trig=3.25kN	Trig=3.25kN	Trig=4.25kN	Trig=4.25kN	Trig=4.25kN	Trig=4.25kN	Trig=4.75kN	Trig=!
4	Stop=0.00kN	Stop=0.00kN	Stop=0.00kN	Stop=0.00kN	Stop=0.00kN	Stop=0.00kN	Stop=0.00kN	Stop=(
5	Pre=6sec	Pre=6sec	Pre=6sec	Pre=6sec	Pre=6sec	Pre=6sec	Pre=6sec	Pre
6	Catch=15sec	Catch=15sec	Catch=15sec	Catch=15sec	Catch=15sec	Catch=15sec	Catch=15sec	Catch=
7	Total=21sec	Total=21sec	Total=21sec	Total=21sec	Total=21sec	Total=21sec	Total=21sec	Total=
8	2.60	3.65	3.62	2.98	4.02	3.71	3.85	
9	2.61	3.69	3.62	2.94	3.98	3.70	3.86	

10 rows × 64 columns



In [4]:

```
# Rename rows to match description and parse out values
rename_dict = {0:"Date",
               1:"Time",
               2:"Speed (Hz)",
               3:"Trig",
               4:"Stop",
               5:"Pre",
               6:"Catch",
               7:"Total",
               }

df.rename(rename_dict, axis='index', inplace=True)

# Remove unnecessary wording from rows
df.replace(to_replace=r'Speed=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Trig=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Stop=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Pre=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Catch=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Total=',value='',regex=True, inplace=True)
df.replace(to_replace=r'Hz',value='',regex=True, inplace=True)

df.head(10)
```

Out[4]:

	No.1	No.2	No.3	No.4	No.5	No.6	No.8	No.9	No.10	No.11	...
Date	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	...
Time	10:12:53	10:13:50	10:15:02	10:16:26	10:17:16	10:17:54	10:19:03	10:20:13	10:21:22	10:22:20	...

	No.1	No.2	No.3	No.4	No.5	No.6	No.8	No.9	No.10	No.11	...
Speed (Hz)	40	40	40	40	40	40	40	40	40	40	...
Trig	3.25kN	3.25kN	4.25kN	4.25kN	4.25kN	4.25kN	4.75kN	5.00kN	5.00kN	5.00kN	...
Stop	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	...
Pre	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	...
Catch	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	...
Total	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	...
8	2.60	3.65	3.62	2.98	4.02	3.71	3.85	3.59	3.85	4.15	...
9	2.61	3.69	3.62	2.94	3.98	3.70	3.86	3.59	3.84	4.14	...

10 rows × 64 columns

As you can see, rows 0 through 7 are characteristics of the recording where 8 through last are the recordings. Let's add a min/max function and insert those values in the 8th and 9th row, respectively.

In [5]:
```
# Make min and max function
def max_min_reading(df, starting_row = 8):
    """ Take in dataframe and starting row to produce a maximum and minimum value for t

    Args:
        df (dataframe): Dataframe we are working with
        starting_row(int): row in the dataframe that the measurements start in (standar

    Returns:
        df_final (dataframe): Original dataframe with max and min value inserted after

    Raises:
        ValueError: the column provided must be an int

    Notes:

    """
    # Raise error if month is not an integer or in 1-12
    if (not isinstance(starting_row, int)):
        raise ValueError('`month` must be an integer')

    max_reading = df.iloc[starting_row:].max()
    df_max = pd.DataFrame(max_reading).T
    df_max.rename({0:"Max"}, axis='index', inplace = True)
    min_reading = df.iloc[starting_row:].min()
    df_min = pd.DataFrame(min_reading).T
    df_min.rename({0:"Min"}, axis='index', inplace = True)

    df_final = pd.concat([df_max, df_min, df], )


    return df_final
```

```
df_final = max_min_reading(df)
df_final.head(15)
```

Out[5]:

	No.1	No.2	No.3	No.4	No.5	No.6	No.8	No.9	No.10	No.11	...
Max	4.04	4.16	5.16	5.13	4.39	5.43	5.24	5.76	5.38	5.08	...
Min	2.52	2.15	1.92	2.16	2.7	2.15	2.14	1.79	1.83	2.05	...
Date	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	13.11.21	...
Time	10:12:53	10:13:50	10:15:02	10:16:26	10:17:16	10:17:54	10:19:03	10:20:13	10:21:22	10:22:20	...
Speed (Hz)	40	40	40	40	40	40	40	40	40	40	...
Trig	3.25kN	3.25kN	4.25kN	4.25kN	4.25kN	4.25kN	4.75kN	5.00kN	5.00kN	5.00kN	...
Stop	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	0.00kN	...
Pre	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	6sec	...
Catch	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	15sec	...
Total	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	21sec	...
8	2.60	3.65	3.62	2.98	4.02	3.71	3.85	3.59	3.85	4.15	...
9	2.61	3.69	3.62	2.94	3.98	3.70	3.86	3.59	3.84	4.14	...
10	2.61	3.73	3.61	2.89	3.94	3.68	3.86	3.59	3.81	4.12	...
11	2.60	3.76	3.60	2.85	3.90	3.67	3.88	3.58	3.79	4.10	...
12	2.60	3.80	3.59	2.81	3.85	3.65	3.89	3.56	3.77	4.07	...

15 rows × 64 columns

Must Create Separate Dataframes based on log speed.

Cannot make proper plots if dataframes have different speeds. This should clean that up and allow for all speeds.

In [6]:

```
# Use Speed row to determine and separate based off of value. Possible values are 10, 4
# These are in object format and not string format and cannot be changed (easily).

hz_10_data = []
hz_40_data = []
hz_640_data = []
hz_1280_data = []

for i in df_final.columns:
    if df_final[i]['Speed (Hz)'] == '10':
        hz_10_data.append(df_final[i])
    elif df_final[i]['Speed (Hz)'] == '40':
        hz_40_data.append(df_final[i])
    elif df_final[i]['Speed (Hz)'] == '640':
        hz_640_data.append(df_final[i])
    elif df_final[i]['Speed (Hz)'] == '1280':
```

```
        hz_1280_data.append(df_final[i])
    else:
        break

# Do for all Hz.
df10 = pd.DataFrame(hz_10_data).T
df40 = pd.DataFrame(hz_40_data).T
df640 = pd.DataFrame(hz_640_data).T
df1280 = pd.DataFrame(hz_1280_data).T
```

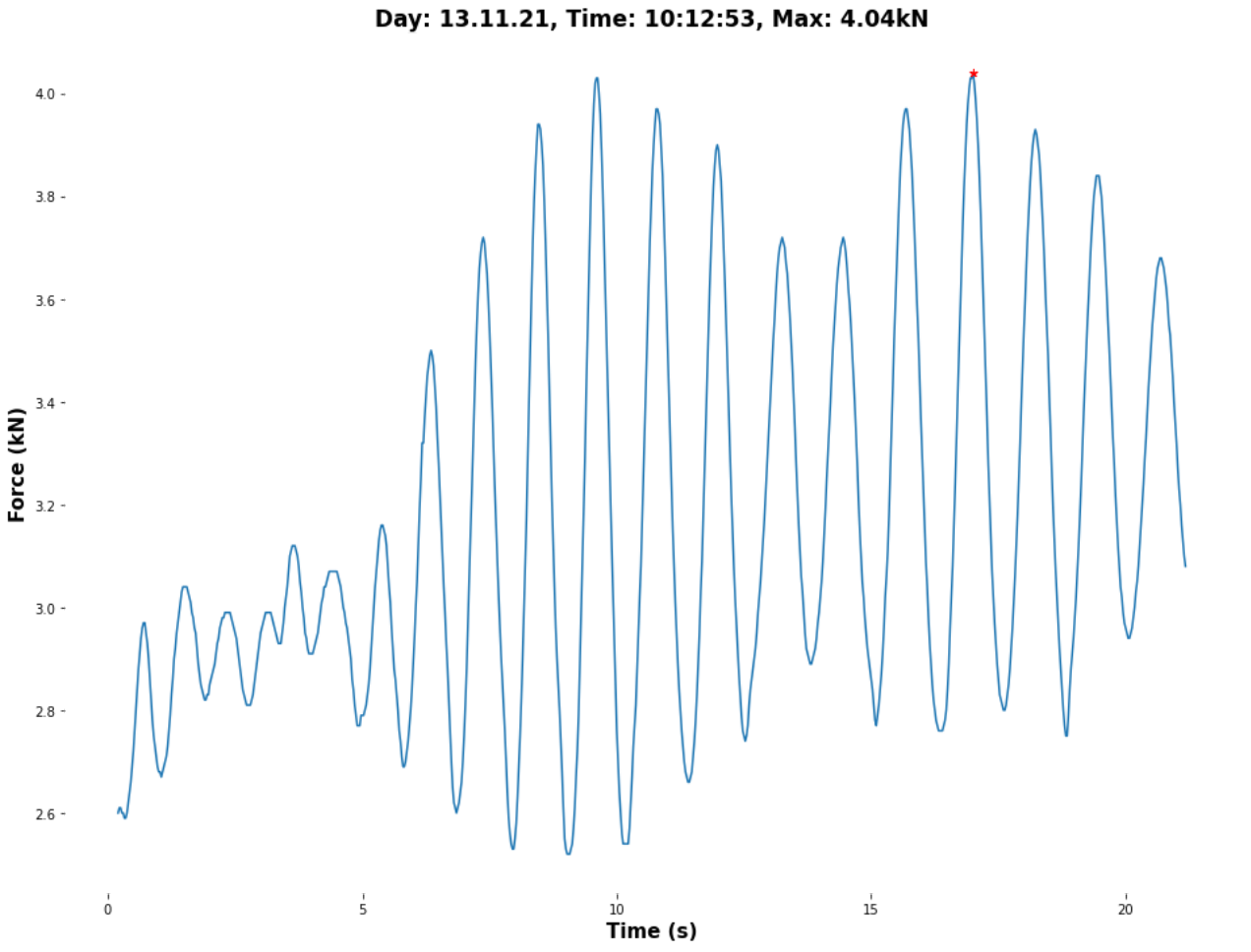
We have to make a separate dataframe for plotting. This includes an accurate seconds column based on the Hz readind.

In [7]:
```
# Make function for converting hz to seconds
def hz_to_sec(df, hz):
    """ Take in dataframe and starting row to produce a maximum and minimum value for t

    Args:
        df (dataframe): Dataframe we are working with
        hz(int): specified hz

    Returns:
        df_nums (dataframe): Original dataframe with max and min value inserted after c

    Raises:
        ValueError: the column provided must be an int

    Notes:

    """
    df_nums = df.iloc[10:]
    df_nums = df_nums.astype('float')
    df_nums.reset_index(inplace = True)
    df_nums['index'] = df_nums['index']/hz
    df_nums.rename({'index' : 'Seconds'}, axis = 1, inplace = True)

    return df_nums

# Do for all Hz.
nums10 = hz_to_sec(df10, 10)
nums40 = hz_to_sec(df40, 40)
nums640 = hz_to_sec(df640, 640)
nums1280 = hz_to_sec(df1280, 1280)
```

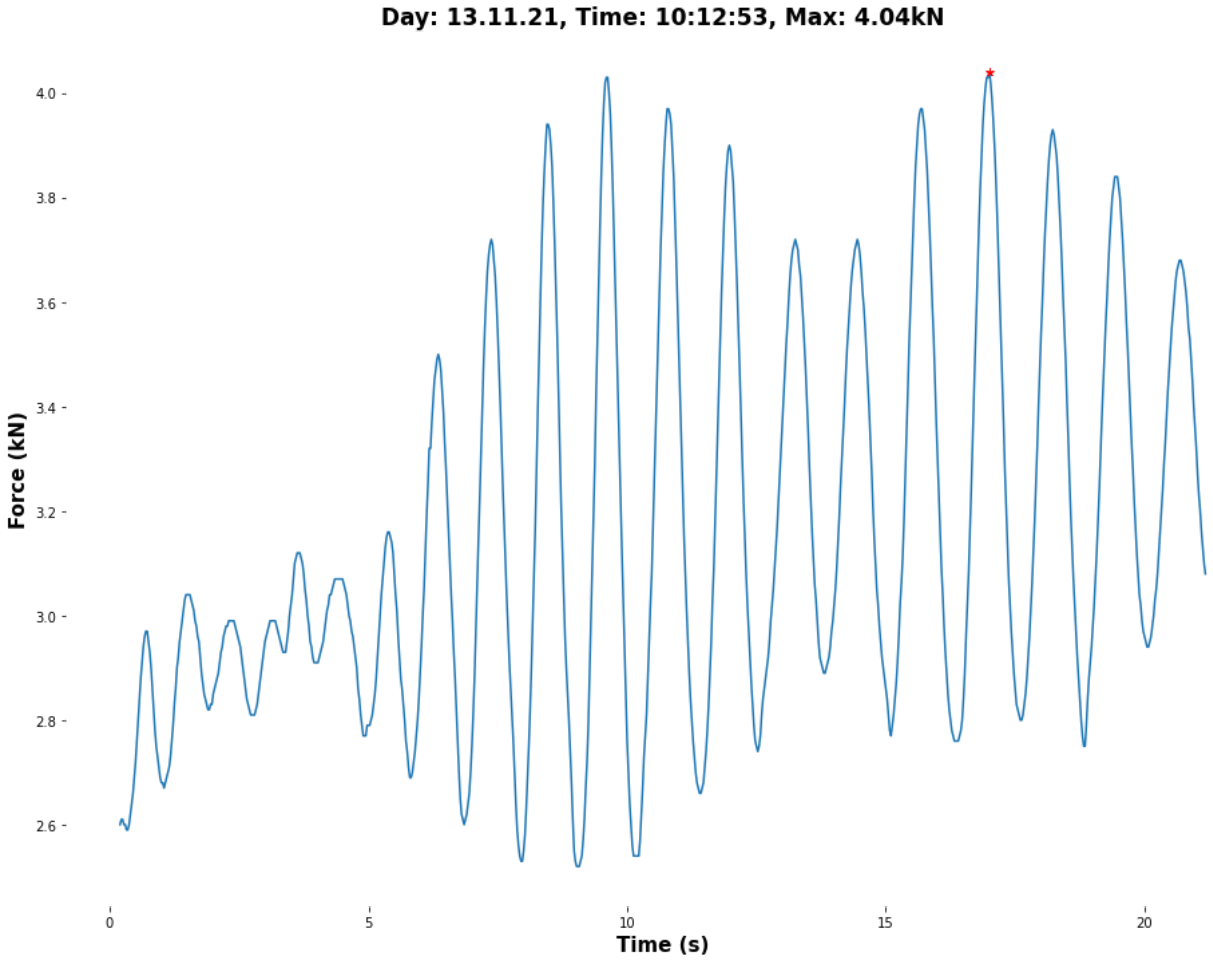
Make a function to plot every column vs. time

In [8]:
```
def plot_kN(df_final, df_nums, col):
    """ Take in dataframe and column to produce graph of section

    Args:
        df_final (dataframe): Dataframe we are working with (final, with labels)
        df_nums (dataframe): Dataframe we are workign with (final, only numbers, format
        col (str): column name

    Returns:
        plotted column

    Raises:
```

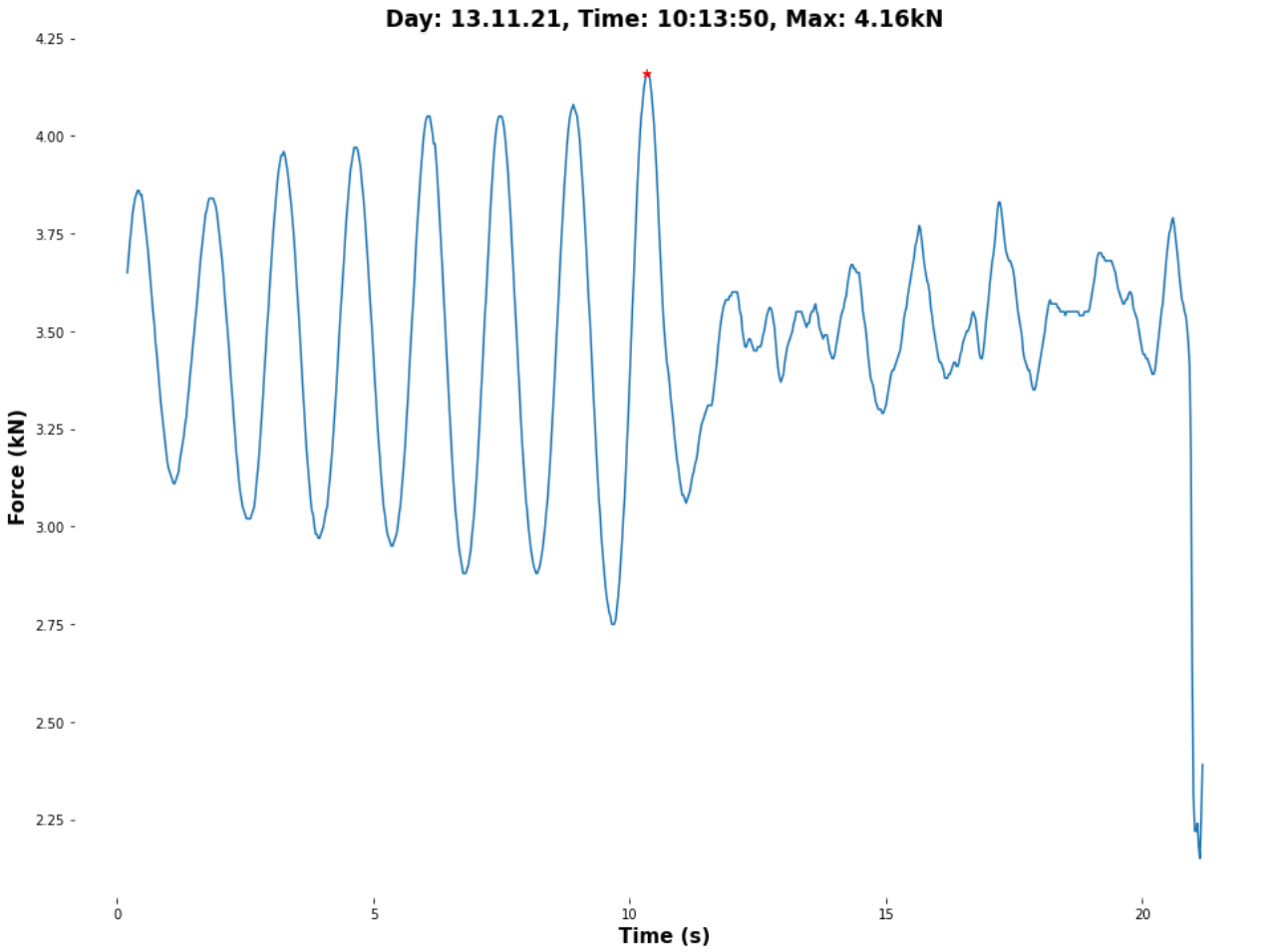
```
    Notes:


    """
    # Plot kN vs time
    fig = plt.figure(figsize = [16,12])
    ax1 = fig.add_subplot(1,1,1)
    ax1.plot(df_nums['Seconds'], df_nums[col])

    # Plot max point
    ax1.plot(df_nums.iloc[df_nums[col].idxmax()][0], df_nums[col].max(), marker = (5,2)

    # Set Title
    ax1.set_title("Day: {0}, Time: {1}, Max: {2}".format(df_final[col]['Date'], df_fina
                                                         str(df_final[col]['Max']) + "k

    # Set Axis
    ax1.set_xlabel("Time (s)", fontweight="bold", fontsize=15)
    ax1.set_ylabel('Force (kN)', fontweight="bold", fontsize=15)

    # Clean Graph
    ax1.spines["top"].set_visible(False)
    ax1.spines["bottom"].set_visible(False)
    ax1.spines["left"].set_visible(False)
    ax1.spines["right"].set_visible(False)


    return plt.show()
```

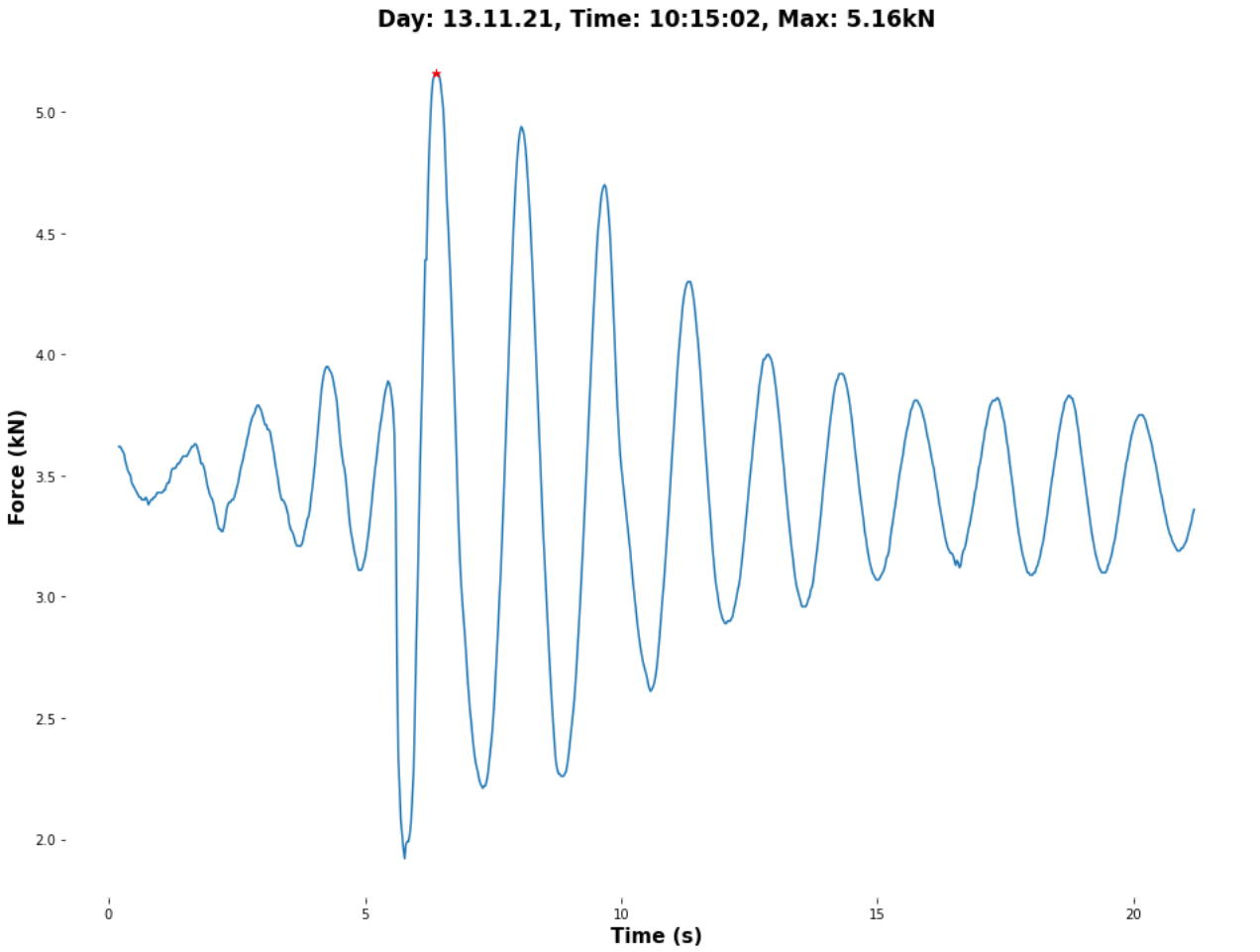


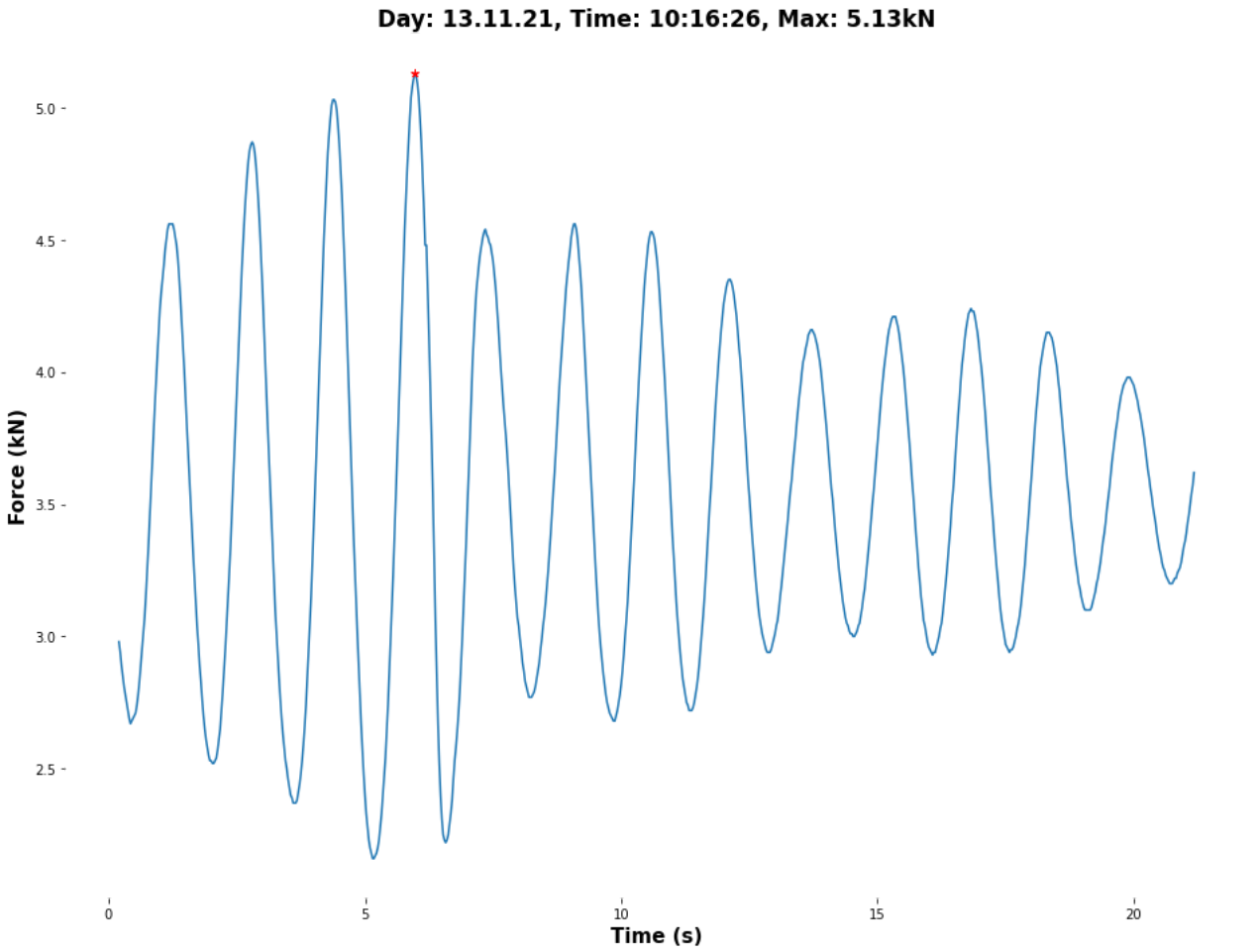
In [9]:
```
for i in df10.columns:
    plot_kN(df10, nums10, i)
    print("-------------------------------------------------------------------------------")

for i in df40.columns:
    plot_kN(df40, nums40, i)
    print("-------------------------------------------------------------------------------")

for i in df640.columns:
    plot_kN(df440, nums640, i)
    print("-------------------------------------------------------------------------------")

for i in df1280.columns:
    plot_kN(df1280, nums1280, i)
    print("-------------------------------------------------------------------------------")
```

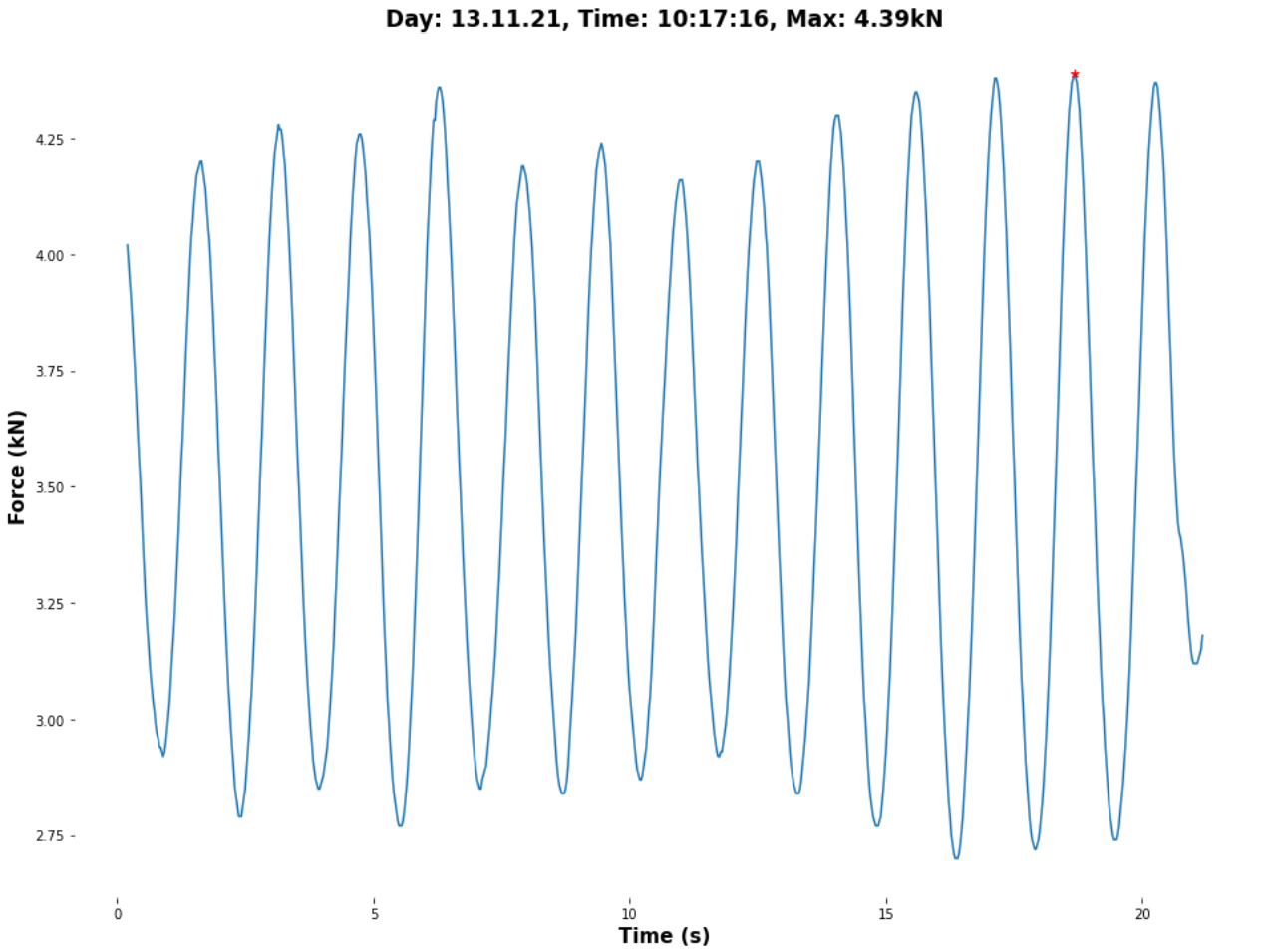


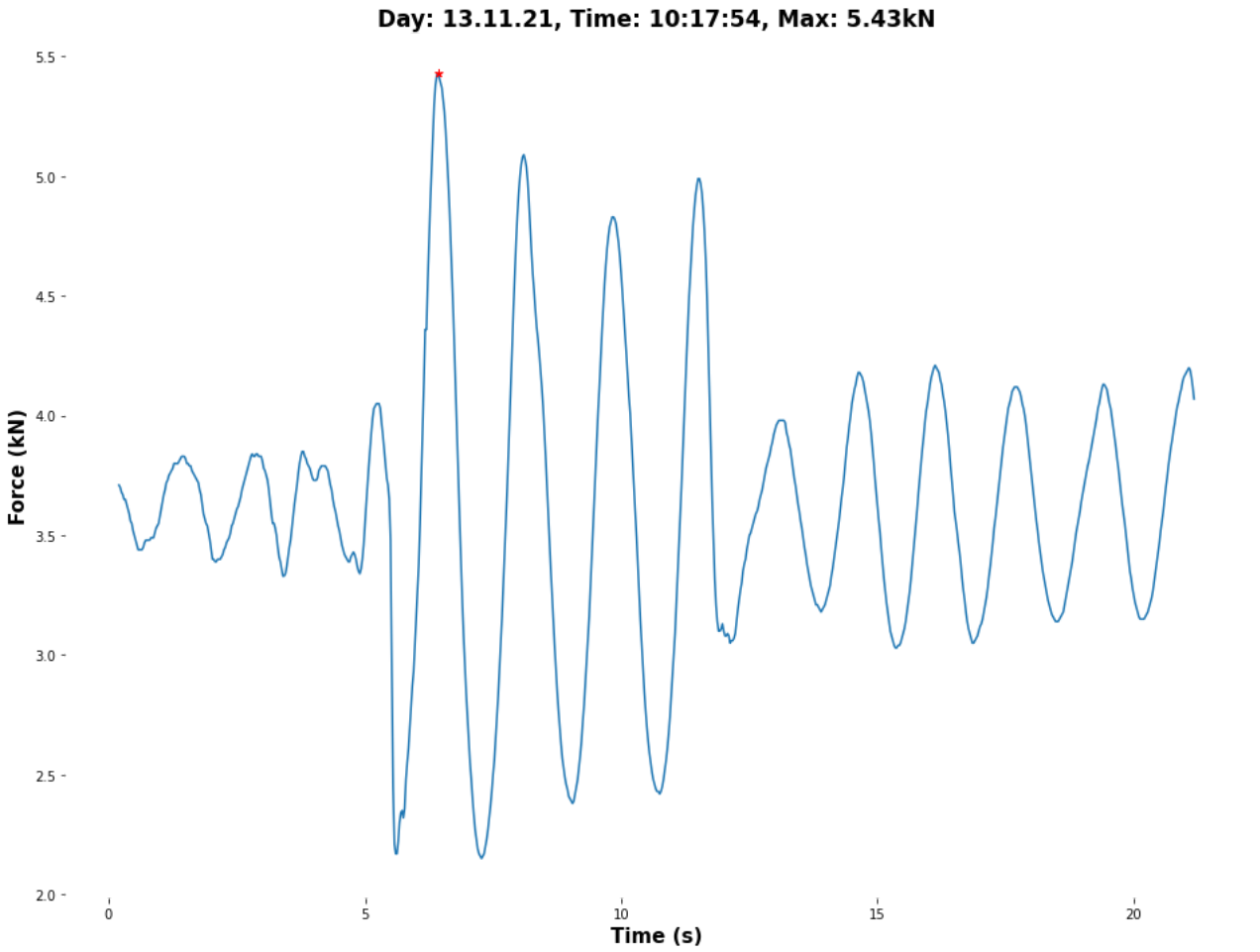

```
-------------------------------------------------------------------------------
-----------------------------------
```

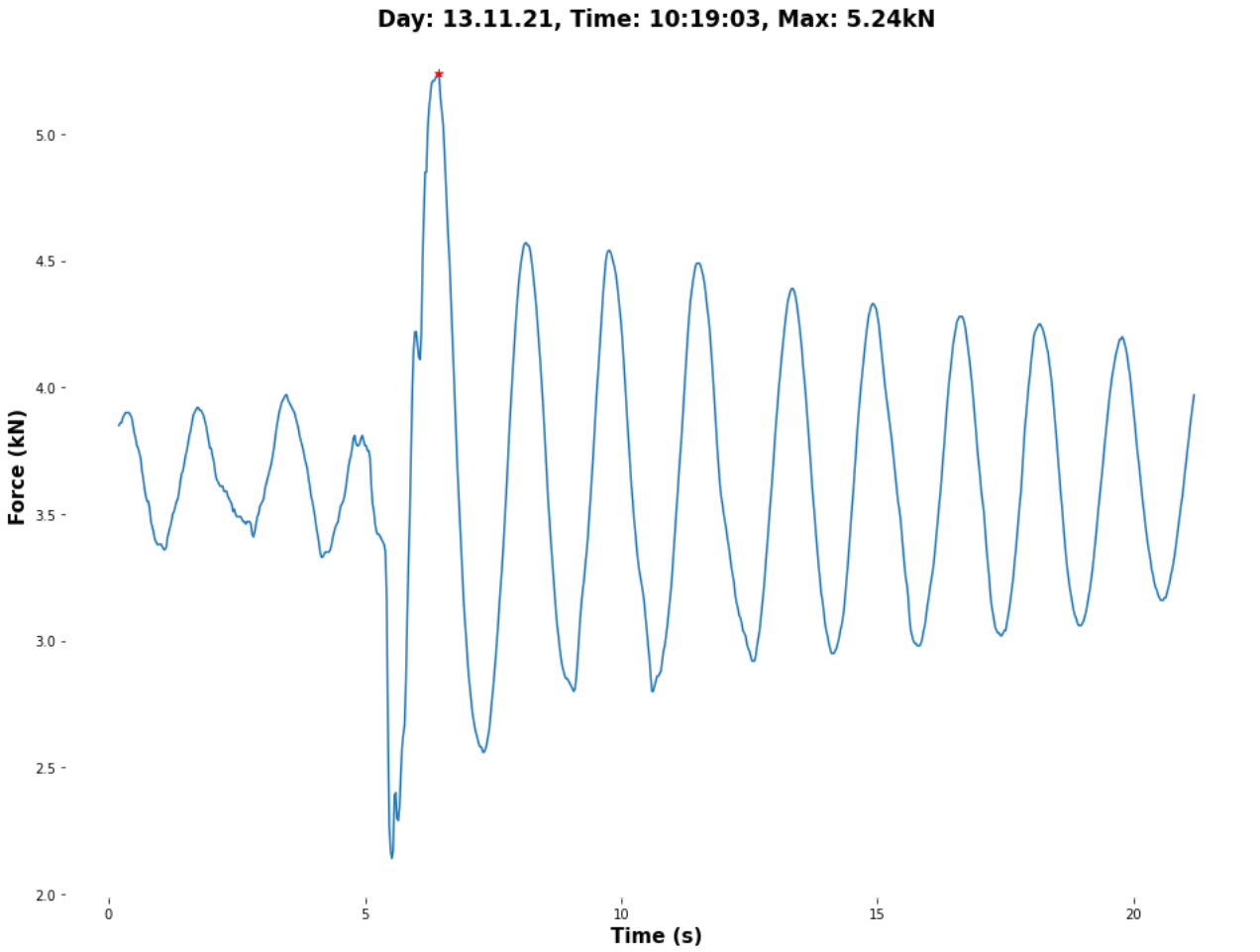

Day: 13.11.21, Time: 10:13:50, Max: 4.16kN
Force (kN)
4.25
4.00
3.75
3.50
3.25
3.00
2.75
2.50
2.25
0
5
10
15
20
Time (s)

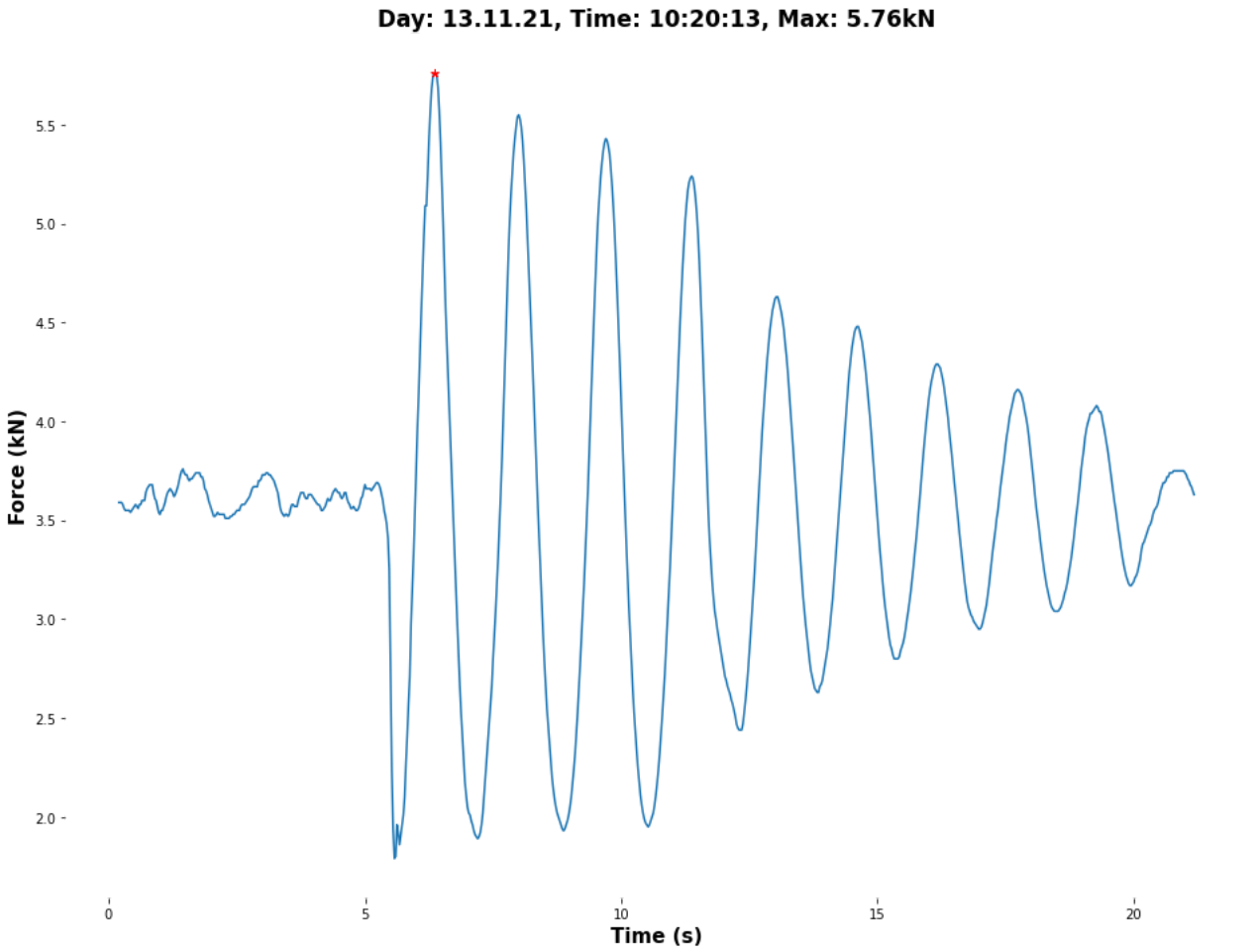

Day: 13.11.21, Time: 10:15:02, Max: 5.16kN
Force (kN)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

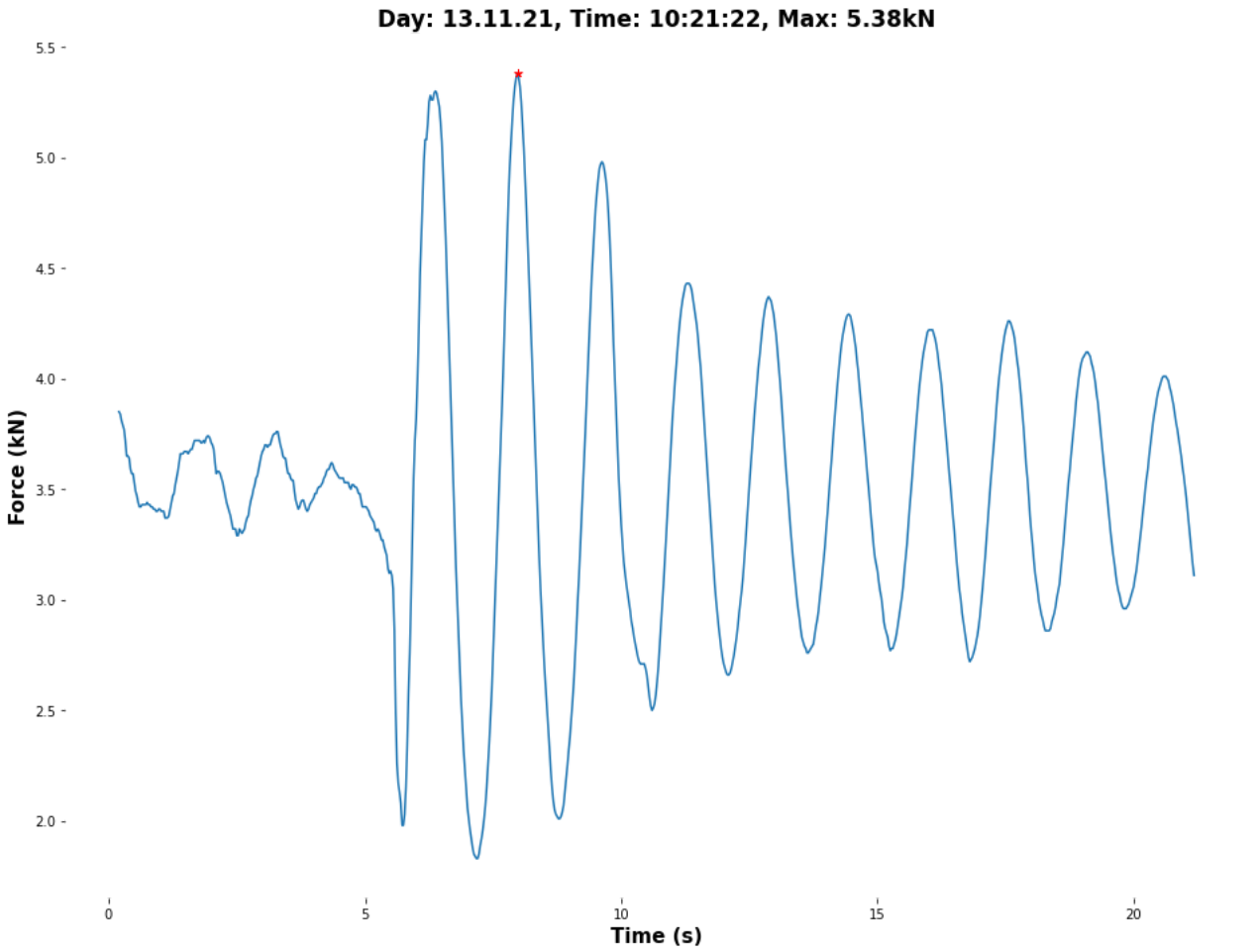

Day: 13.11.21, Time: 10:16:26, Max: 5.13kN
Force (kN)
5.0
4.5
4.0
3.5
3.0
2.5
0
5
10
15
20
Time (s)

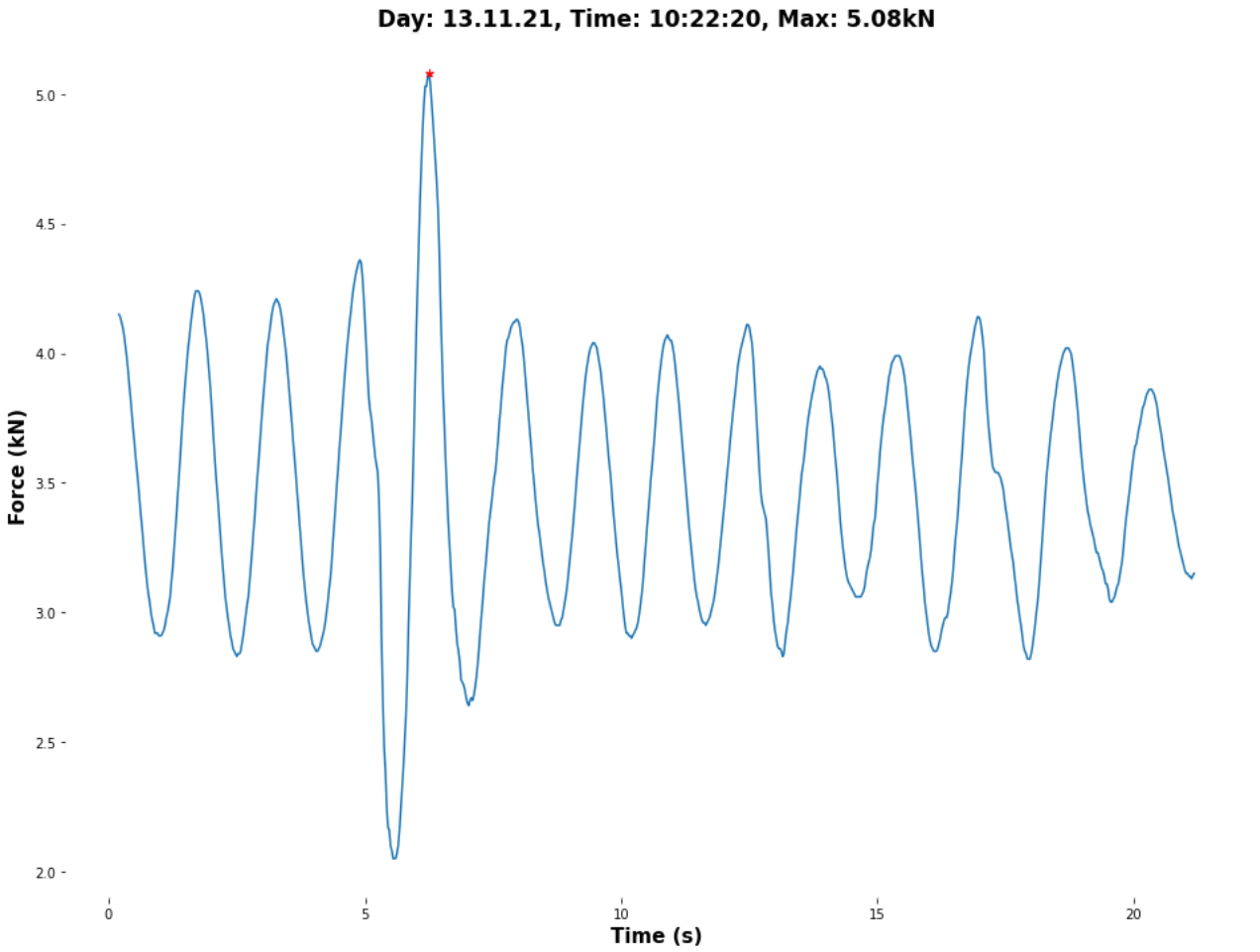

Day: 13.11.21, Time: 10:17:16, Max: 4.39kN
Force (kN)
4.25
4.00
3.75
3.50
3.25
3.00
2.75
0
5
10
15
20
Time (s)

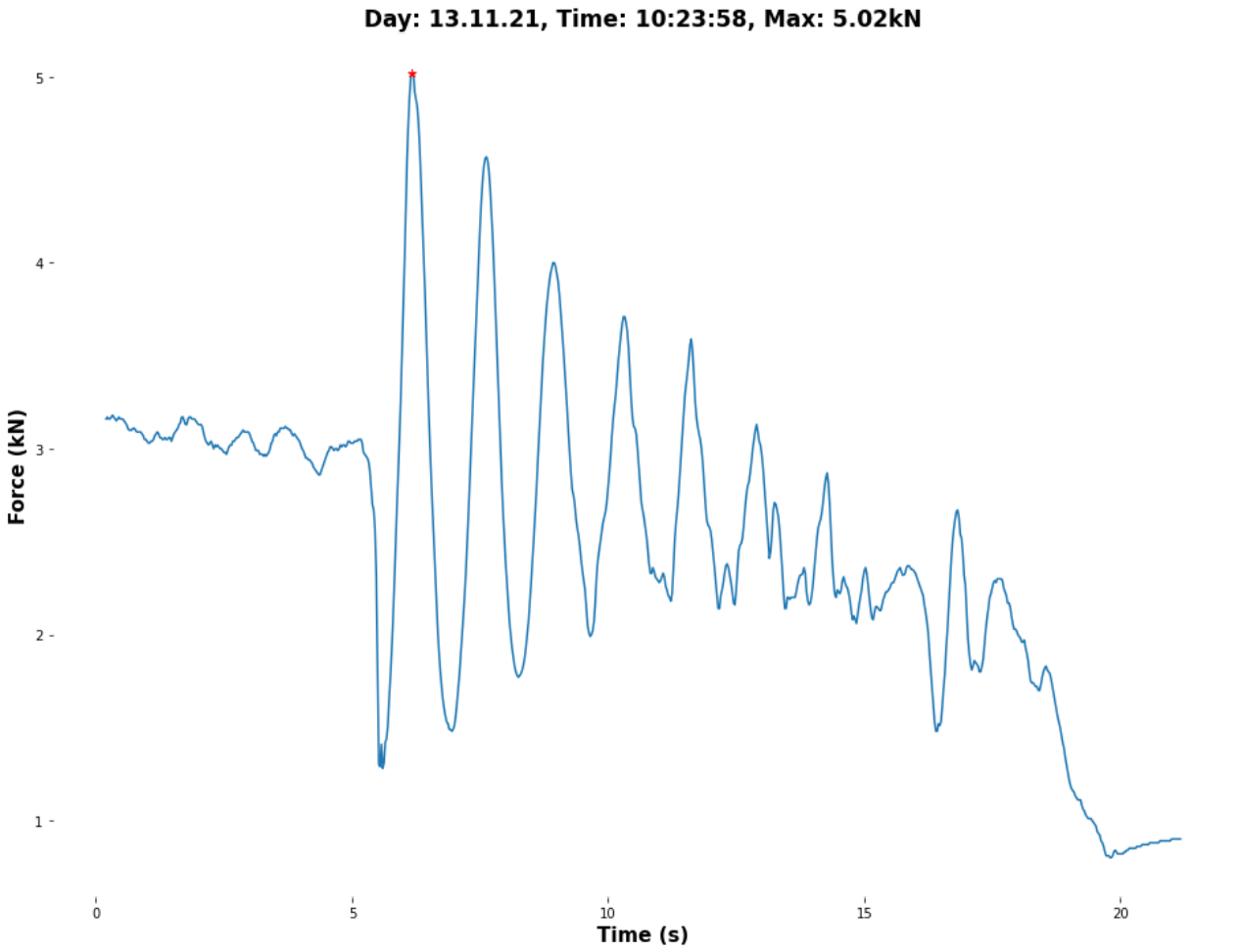

Day: 13.11.21, Time: 10:17:54, Max: 5.43kN
Force (kN)
Time (s)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20

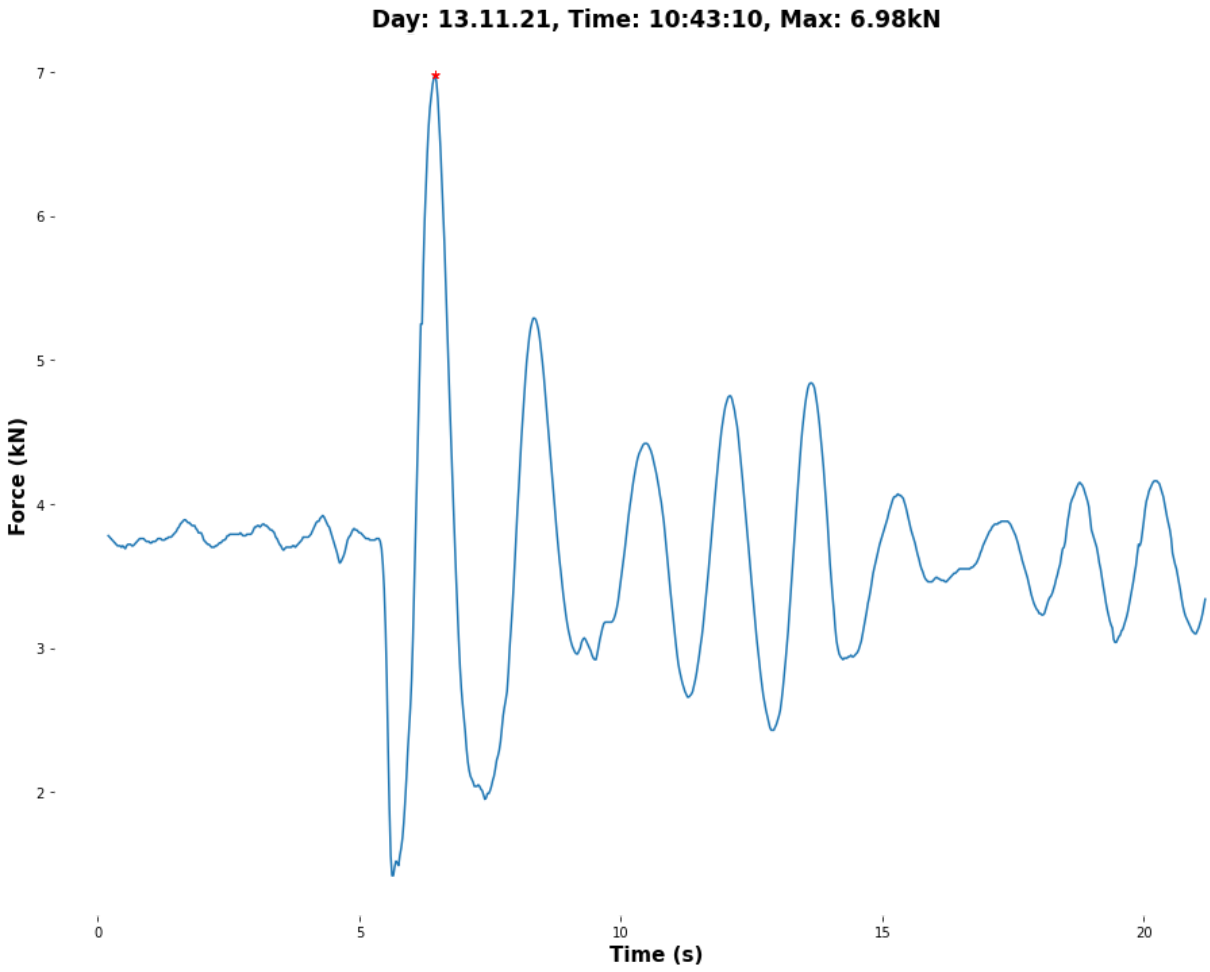

Day: 13.11.21, Time: 10:19:03, Max: 5.24kN
Force (kN)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

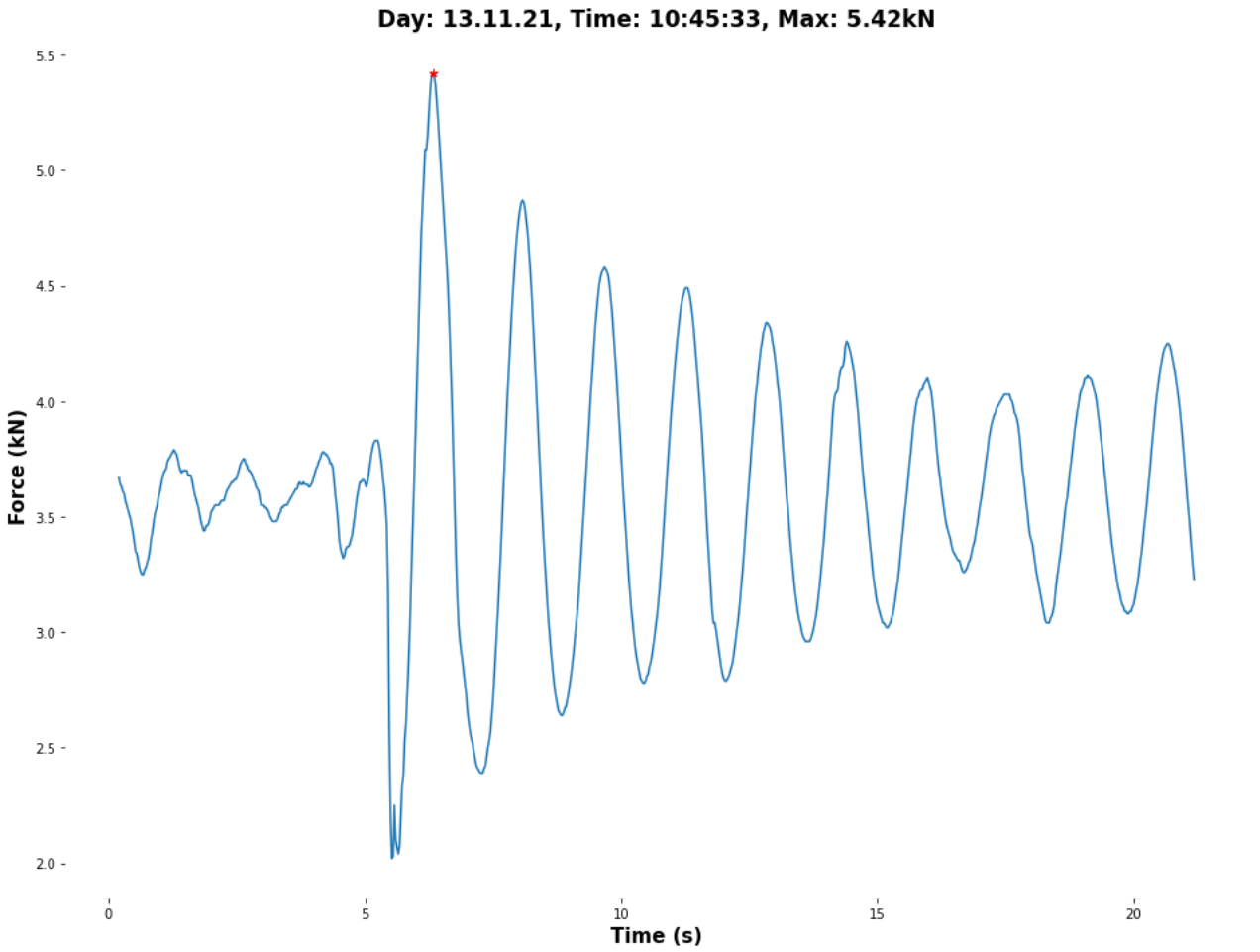

Day: 13.11.21, Time: 10:20:13, Max: 5.76kN
Force (kN)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

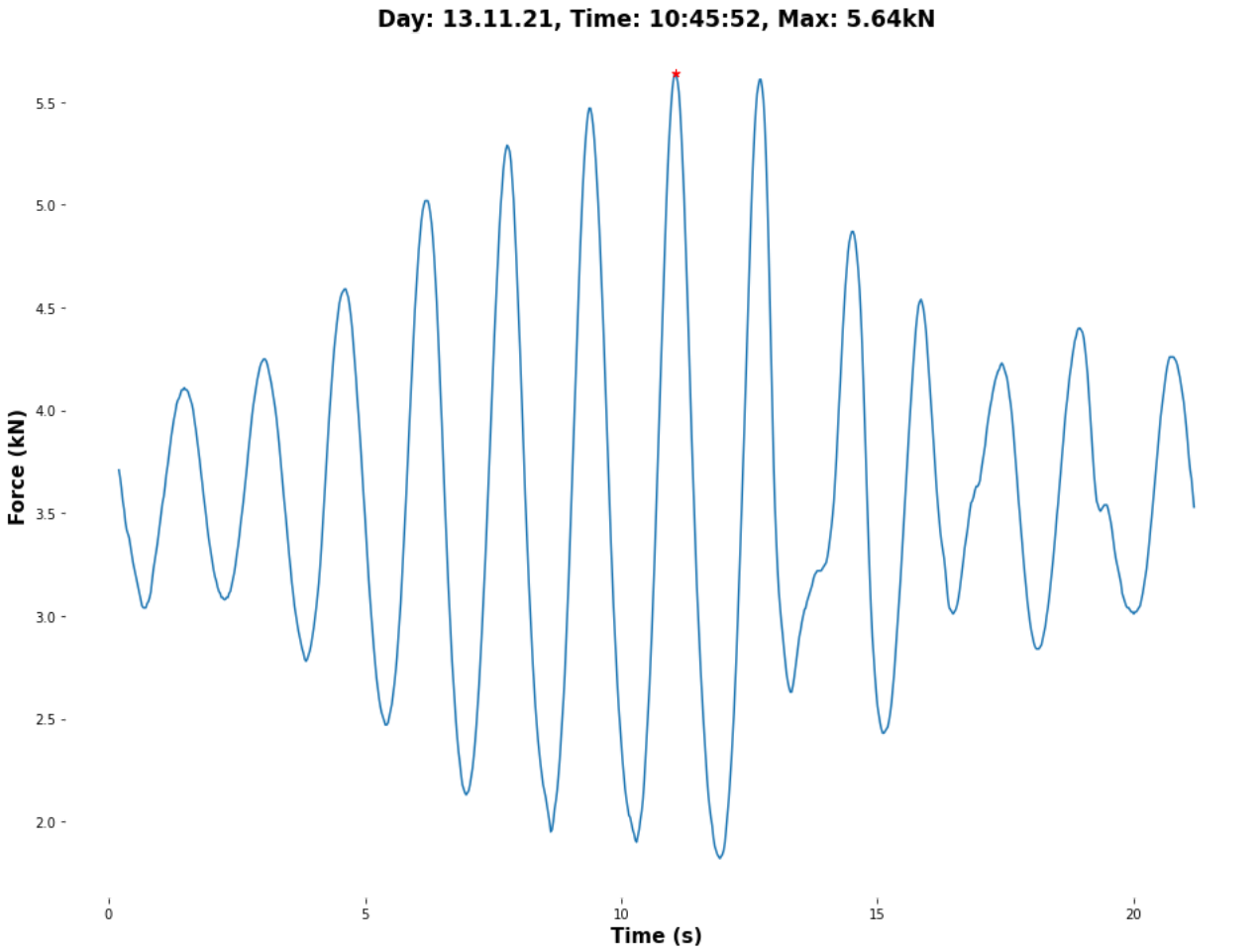

Day: 13.11.21, Time: 10:21:22, Max: 5.38kN
Force (kN)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

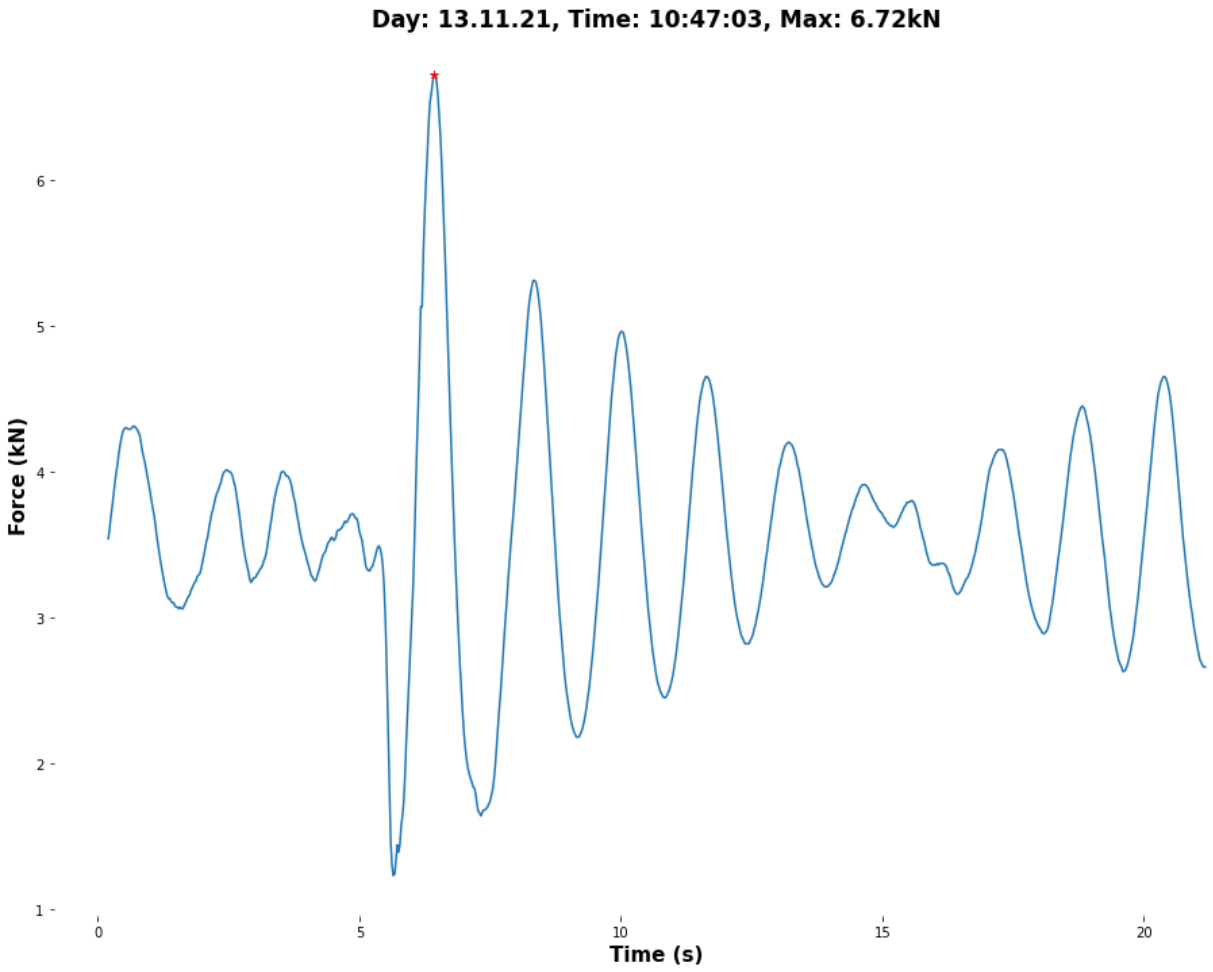

Day: 13.11.21, Time: 10:22:20, Max: 5.08kN
Force (kN)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

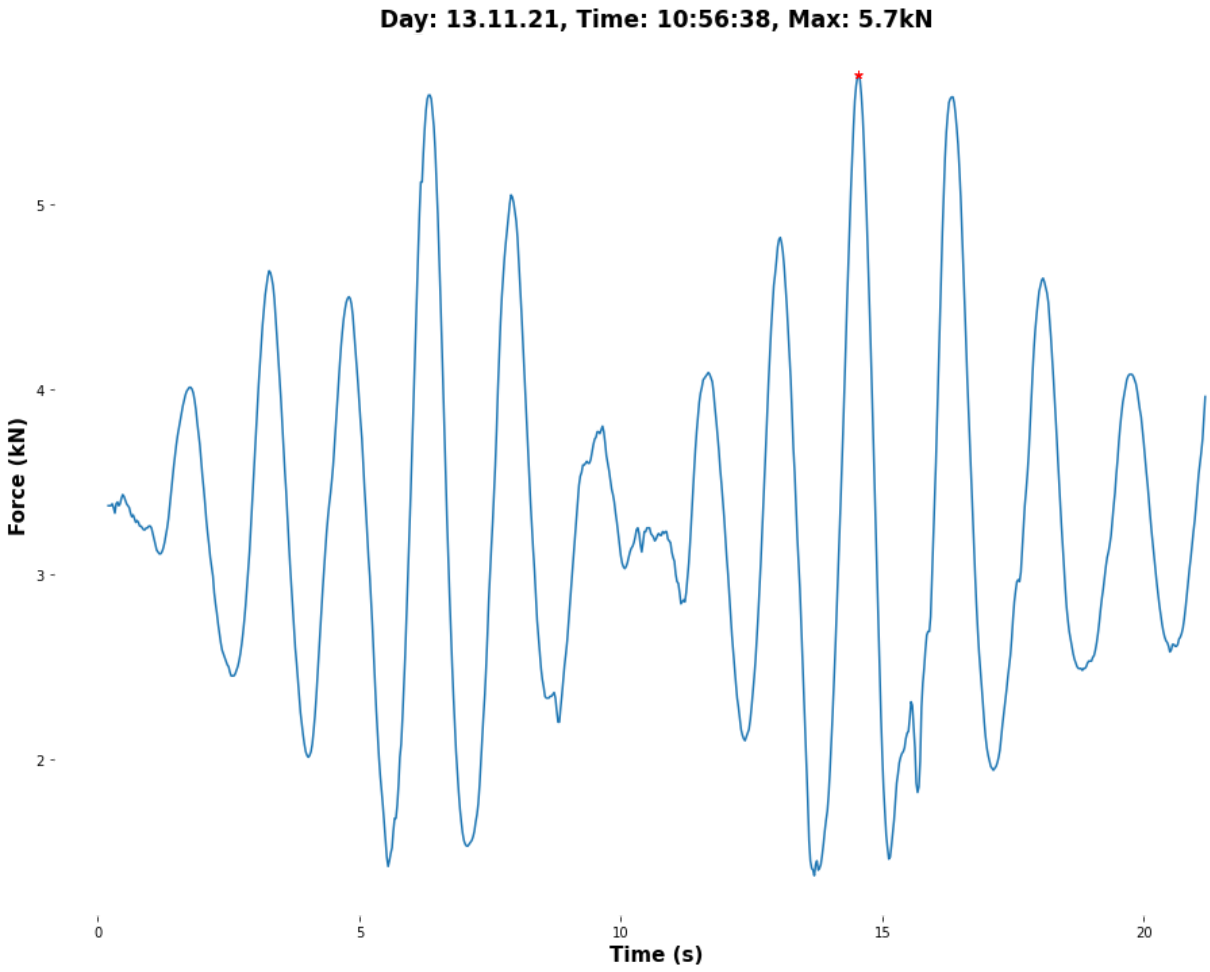

Day: 13.11.21, Time: 10:23:58, Max: 5.02kN
Force (kN)
Time (s)
1
2
3
4
5
0
5
10
15
20

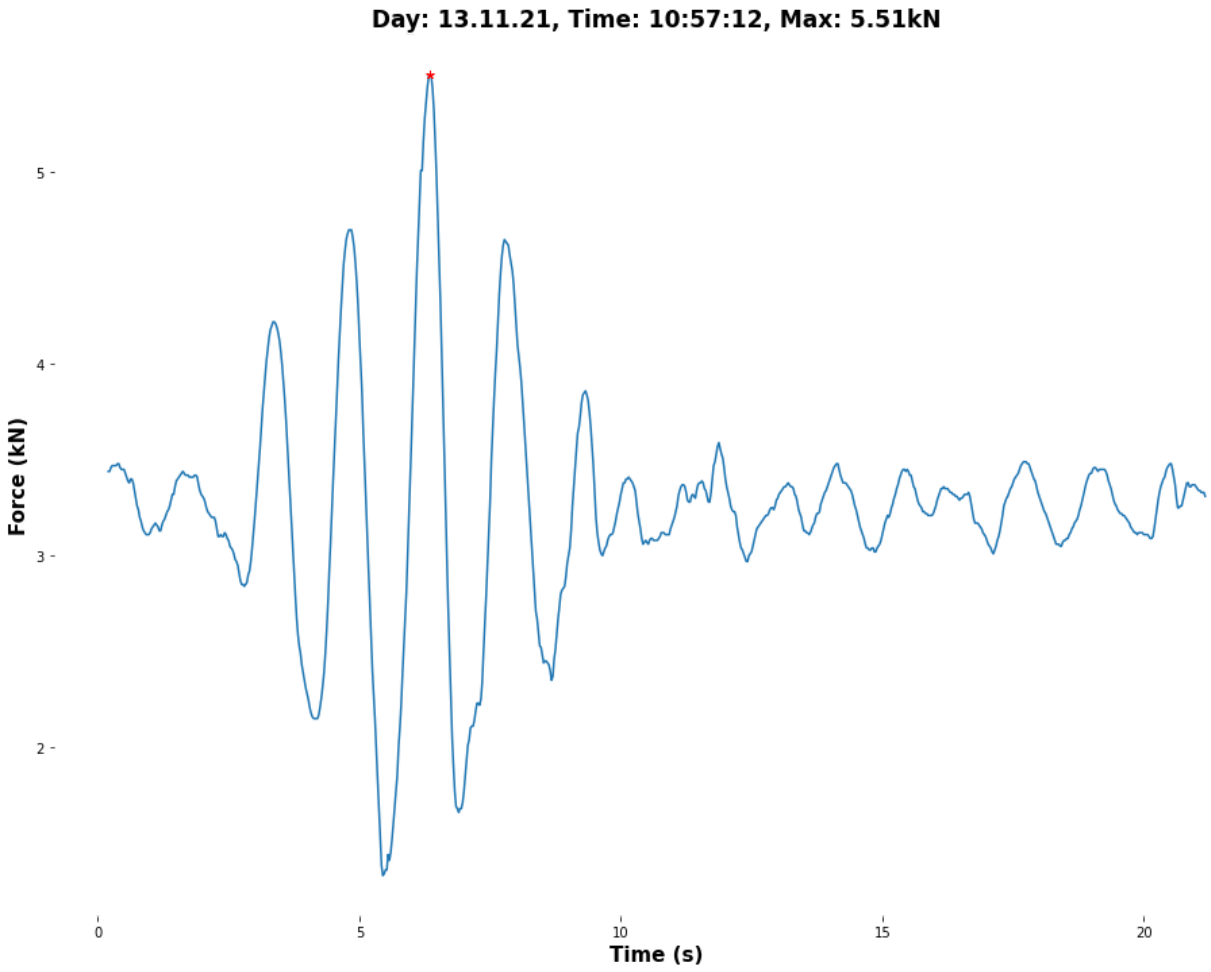

Day: 13.11.21, Time: 10:43:10, Max: 6.98kN
Force (kN)
7
6
5
4
3
2
0
5
10
15
20
Time (s)

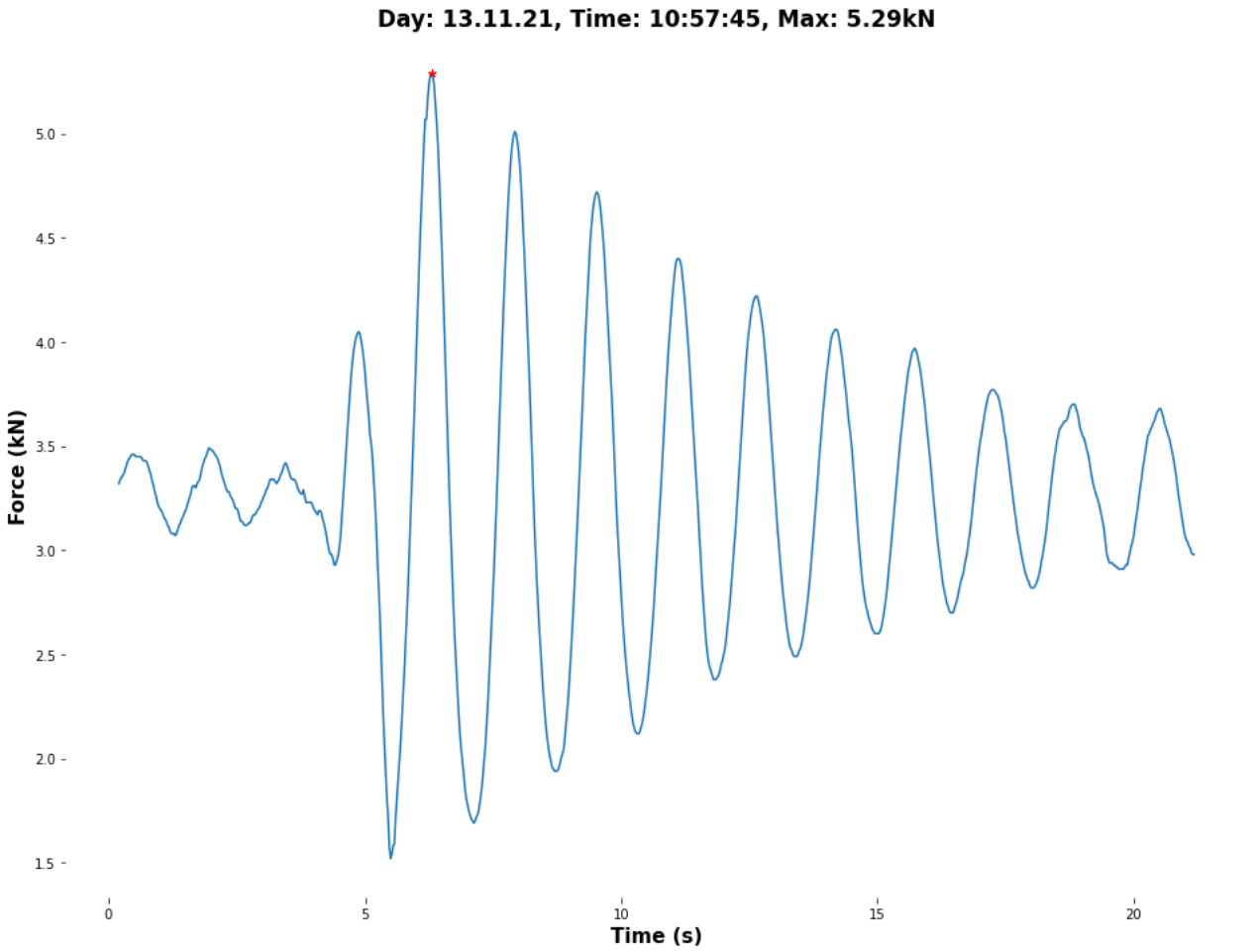

Day: 13.11.21, Time: 10:45:33, Max: 5.42kN
Force (kN)
Time (s)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20

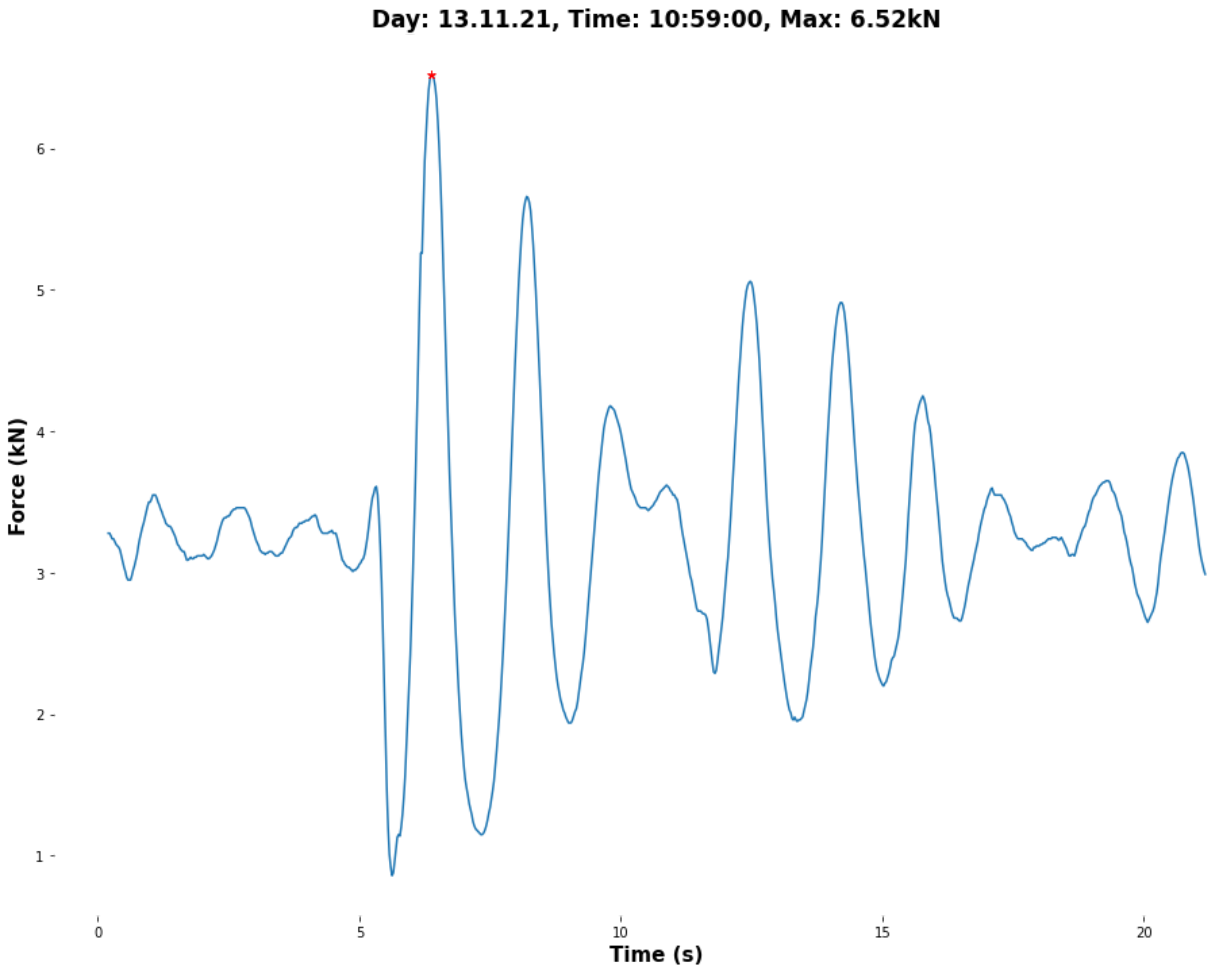

Day: 13.11.21, Time: 10:45:52, Max: 5.64kN
Force (kN)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
0
5
10
15
20
Time (s)

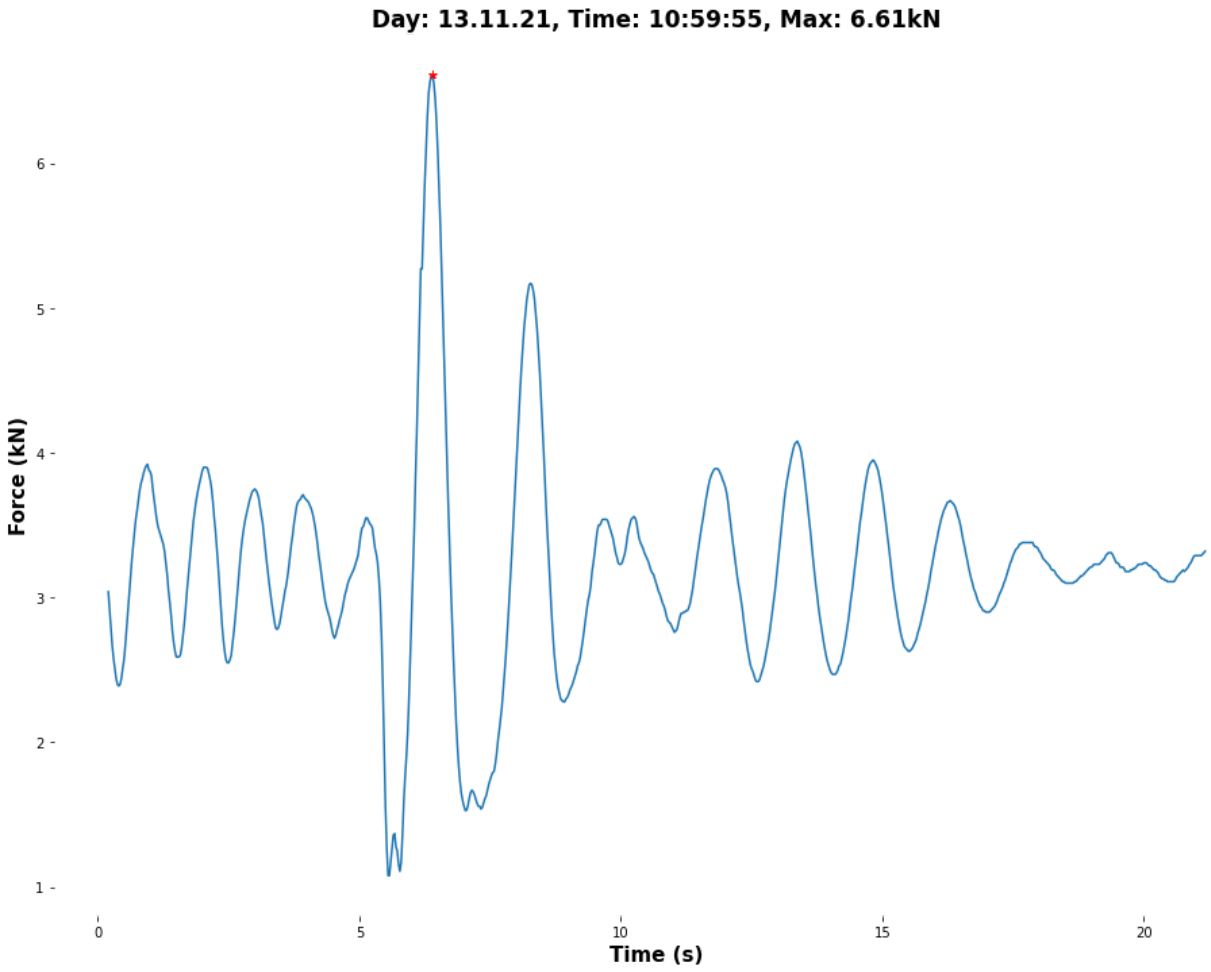

Day: 13.11.21, Time: 10:47:03, Max: 6.72kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

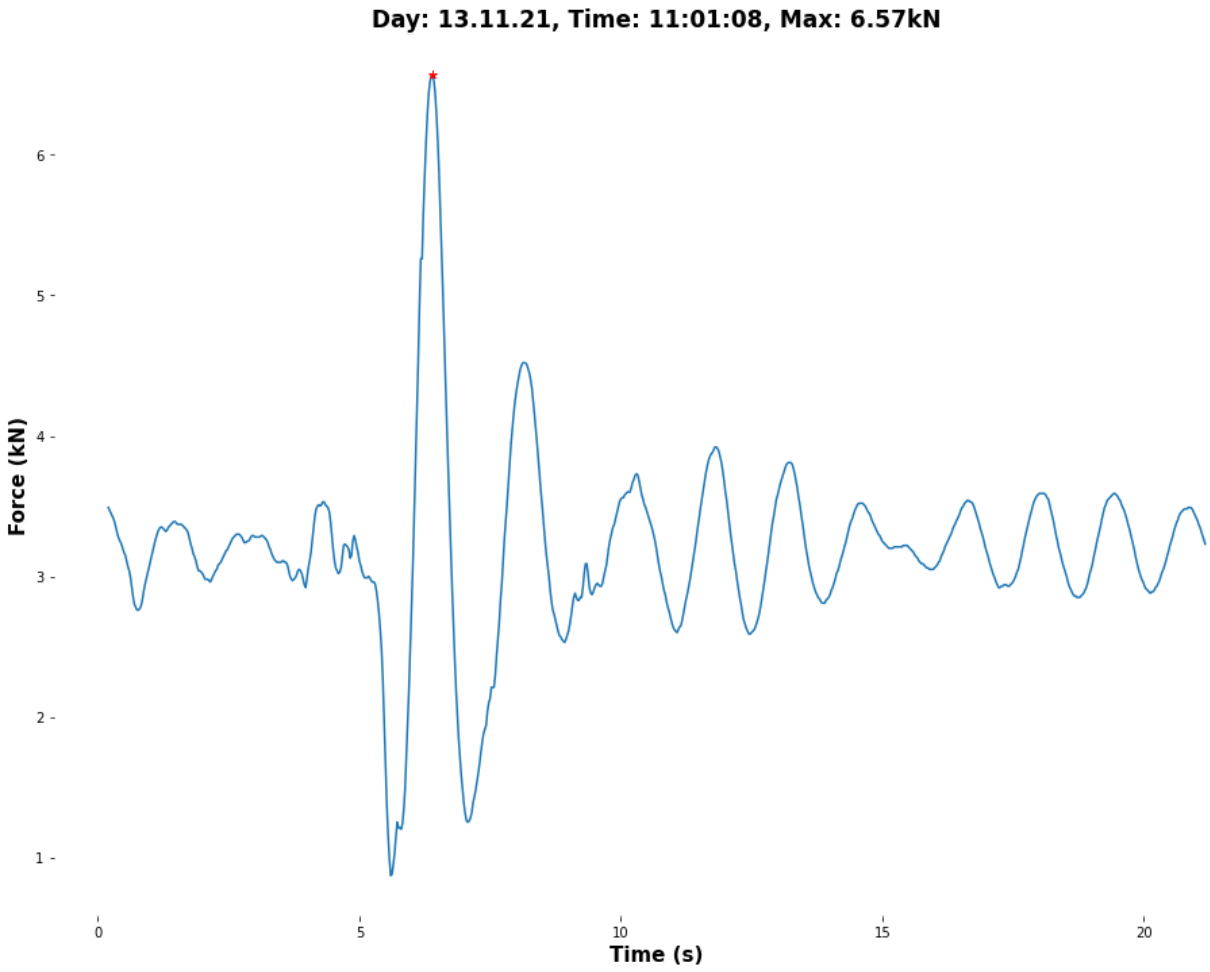

Day: 13.11.21, Time: 10:56:38, Max: 5.7kN
Force (kN)
5
4
3
2
0
5
10
15
20
Time (s)

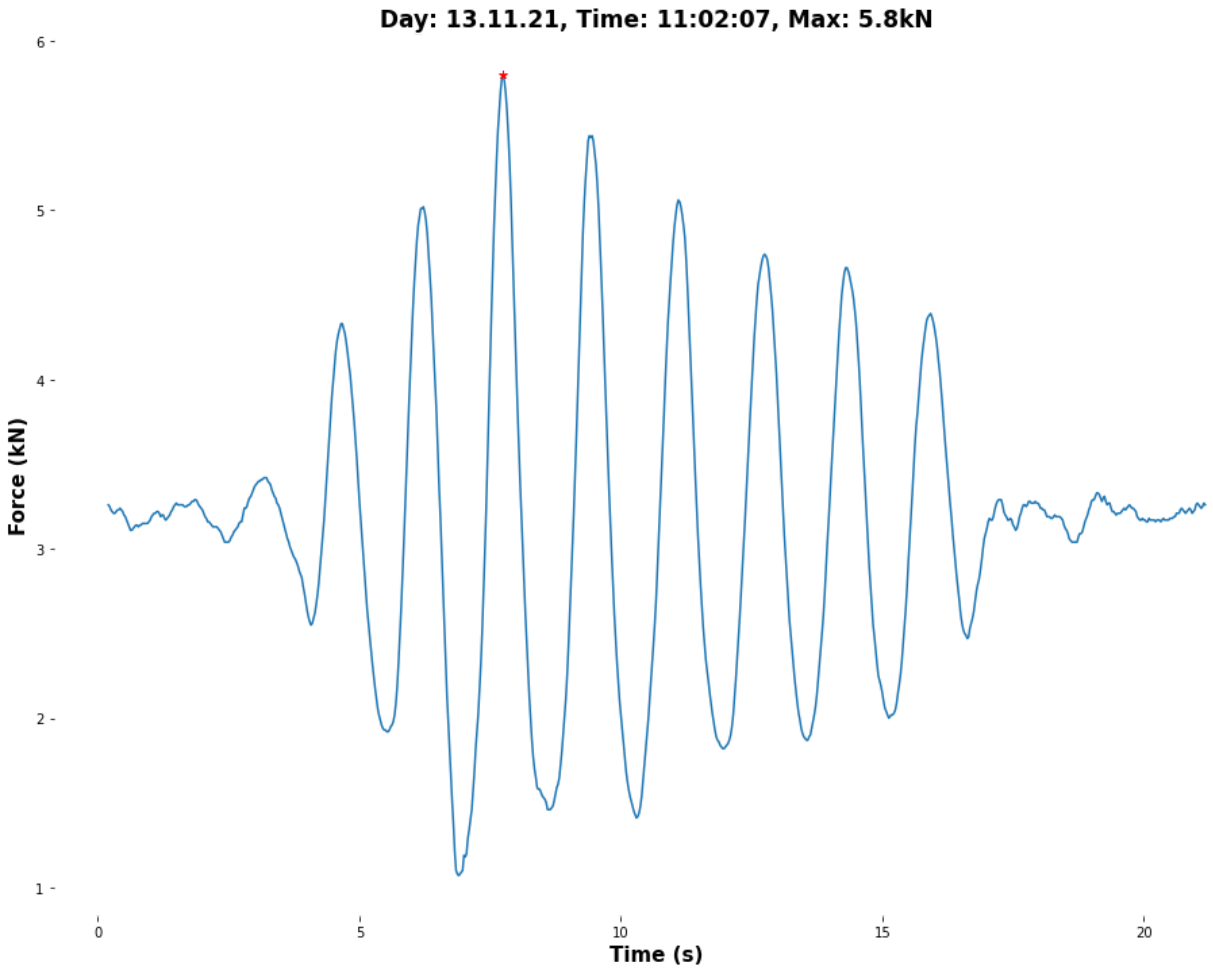

Day: 13.11.21, Time: 10:57:12, Max: 5.51kN
Force (kN)
5
4
3
2
0
5
10
15
20
Time (s)

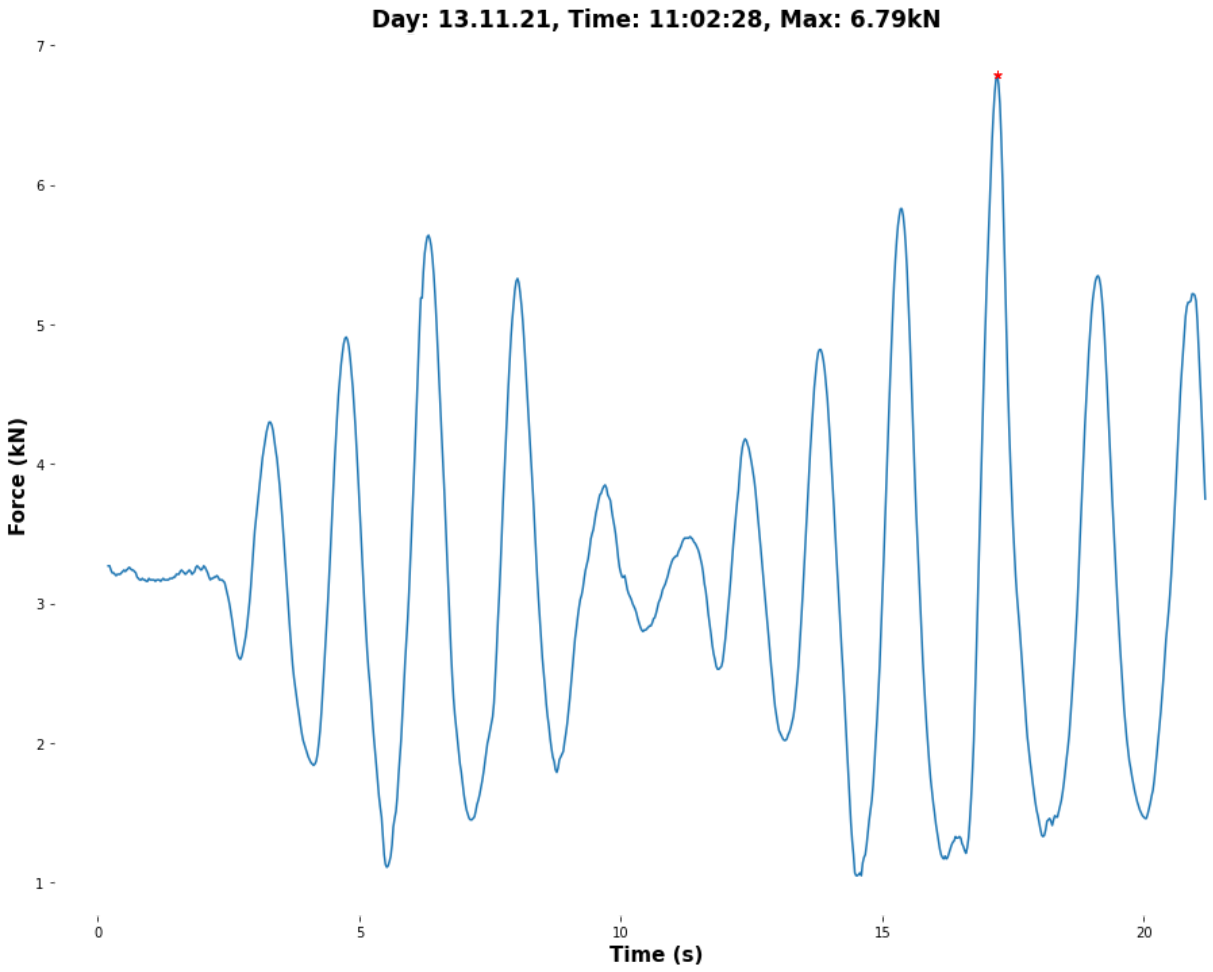

Day: 13.11.21, Time: 10:57:45, Max: 5.29kN
Force (kN)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
0
5
10
15
20
Time (s)

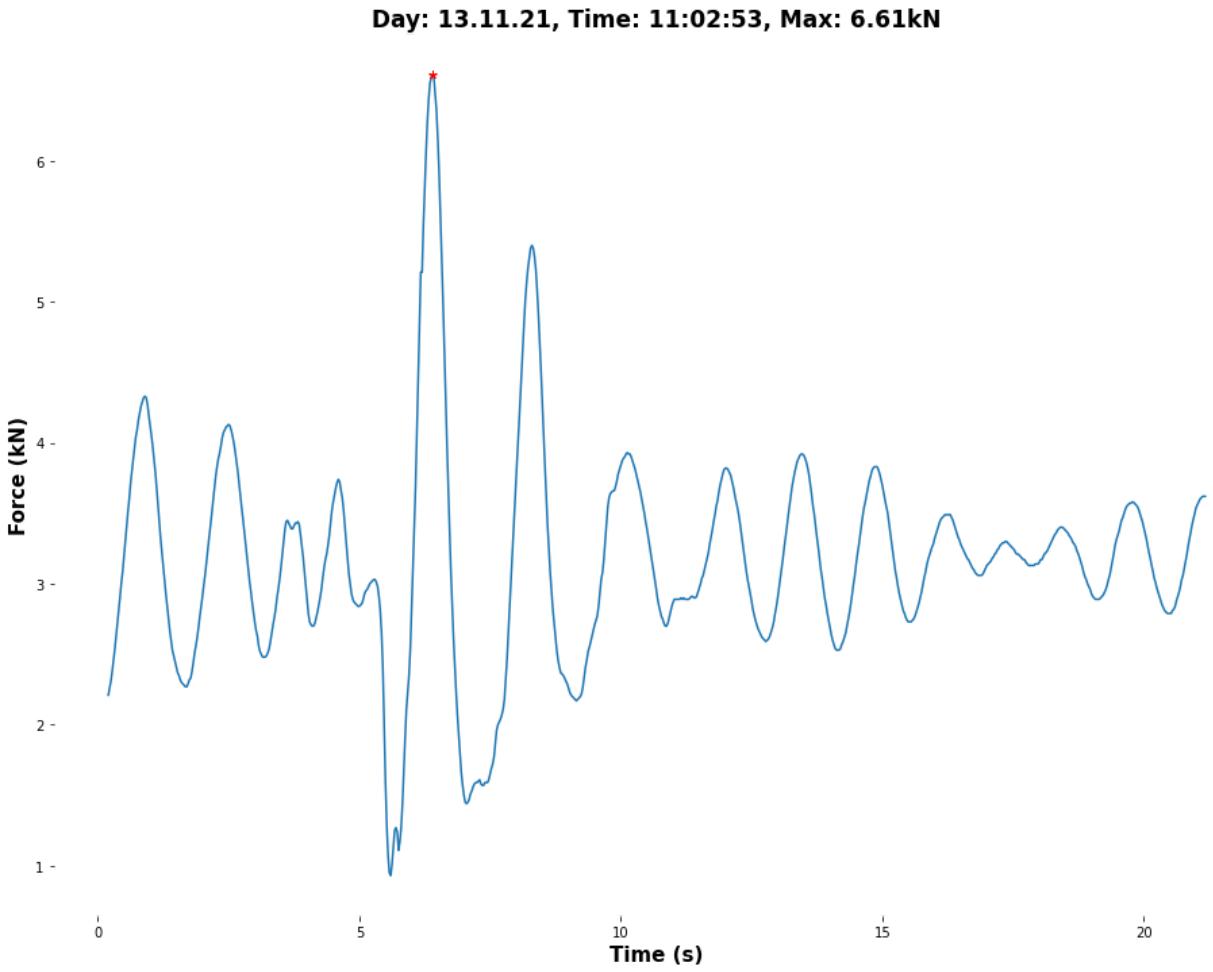

Day: 13.11.21, Time: 10:59:00, Max: 6.52kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

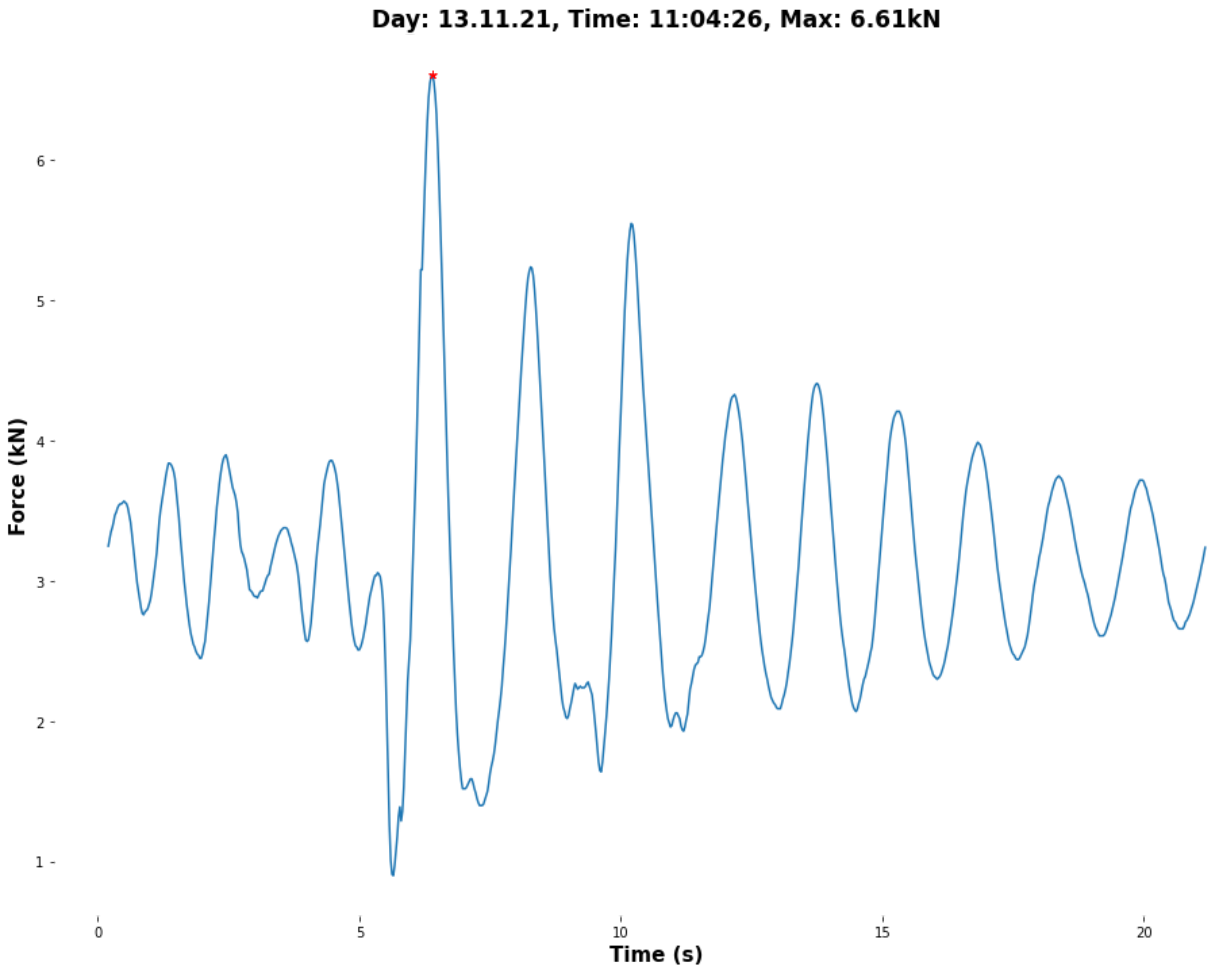

Day: 13.11.21, Time: 10:59:55, Max: 6.61kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

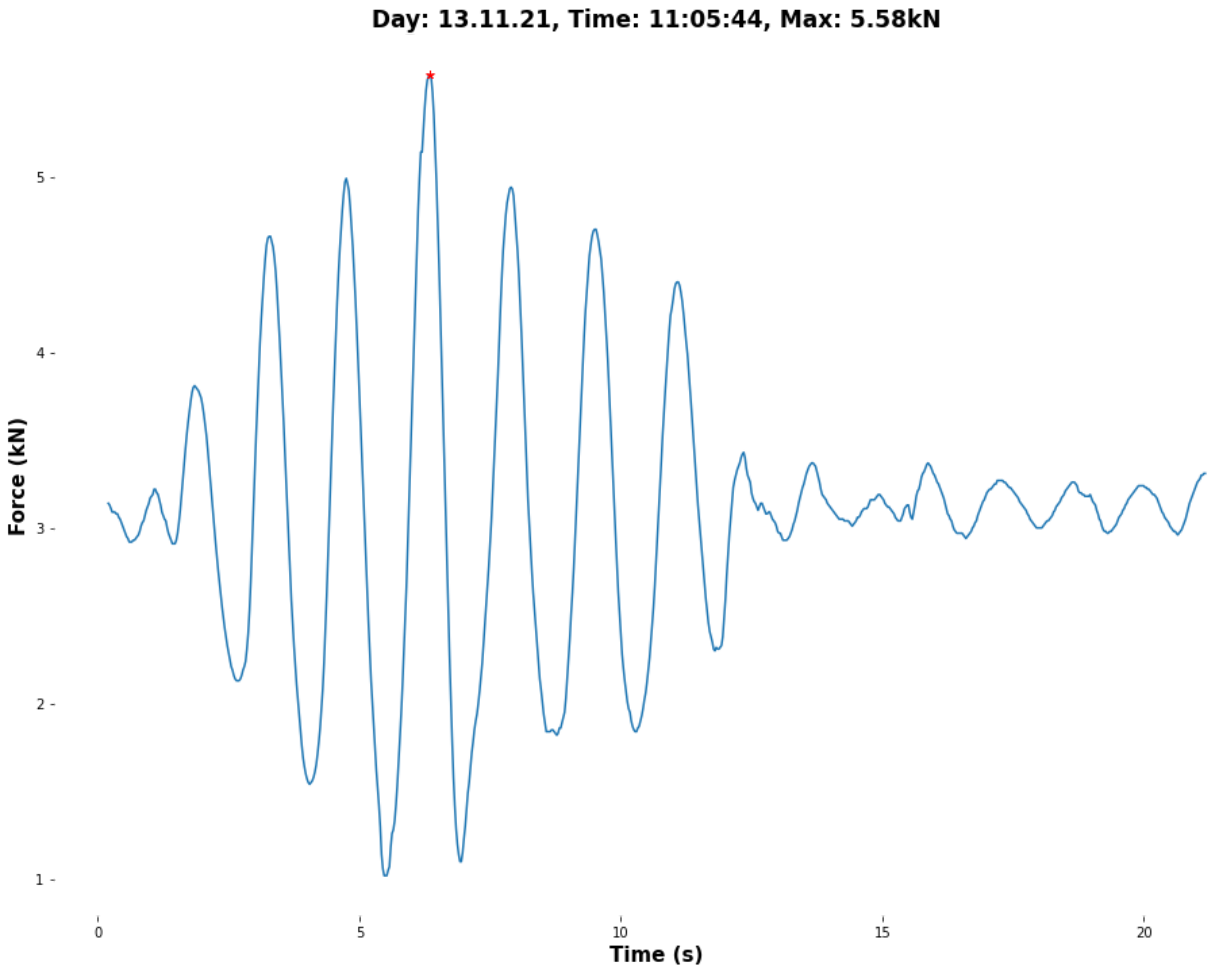

Day: 13.11.21, Time: 11:01:08, Max: 6.57kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

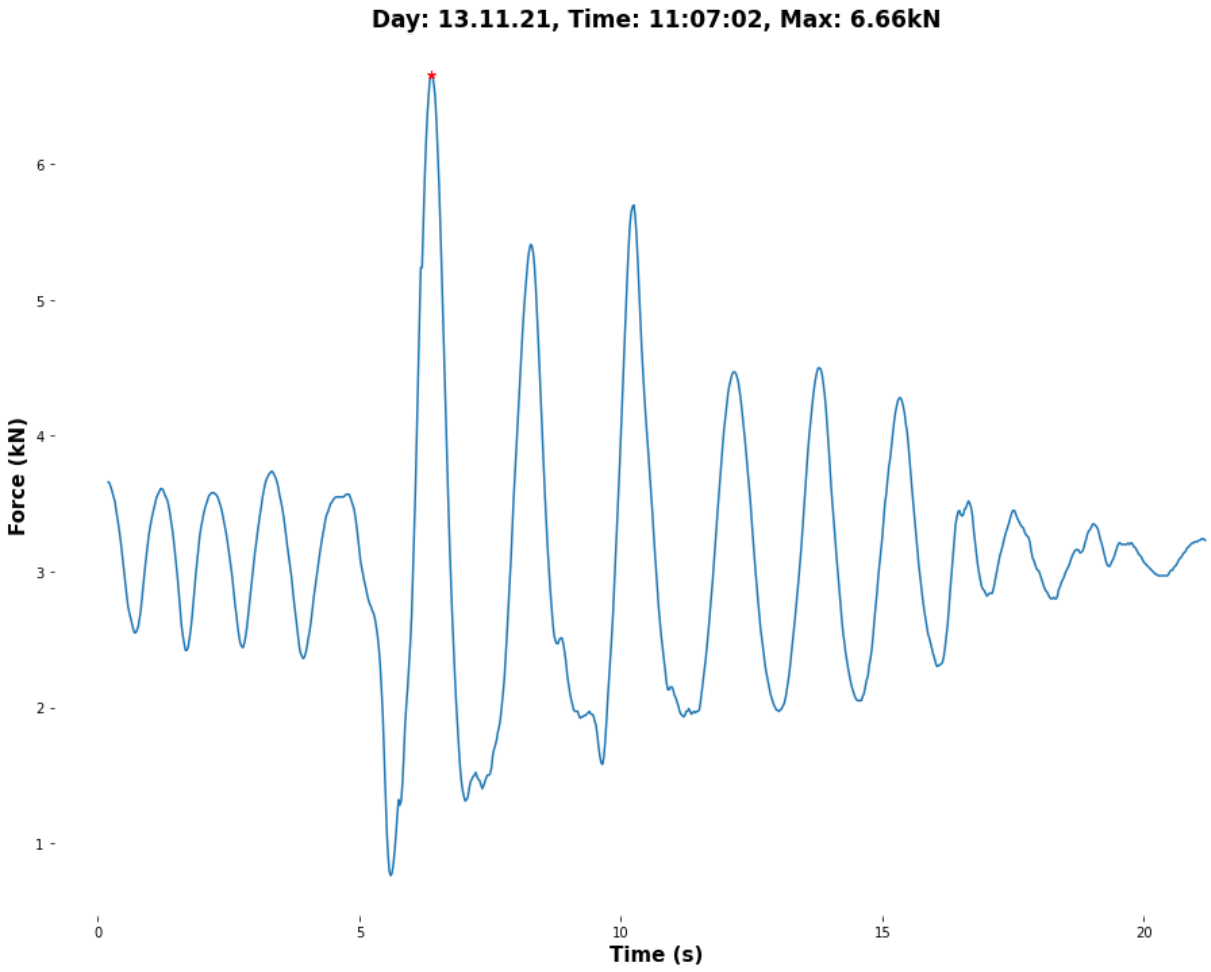

Day: 13.11.21, Time: 11:02:07, Max: 5.8kN
Force (kN)
Time (s)
6
5
4
3
2
1
0
5
10
15
20

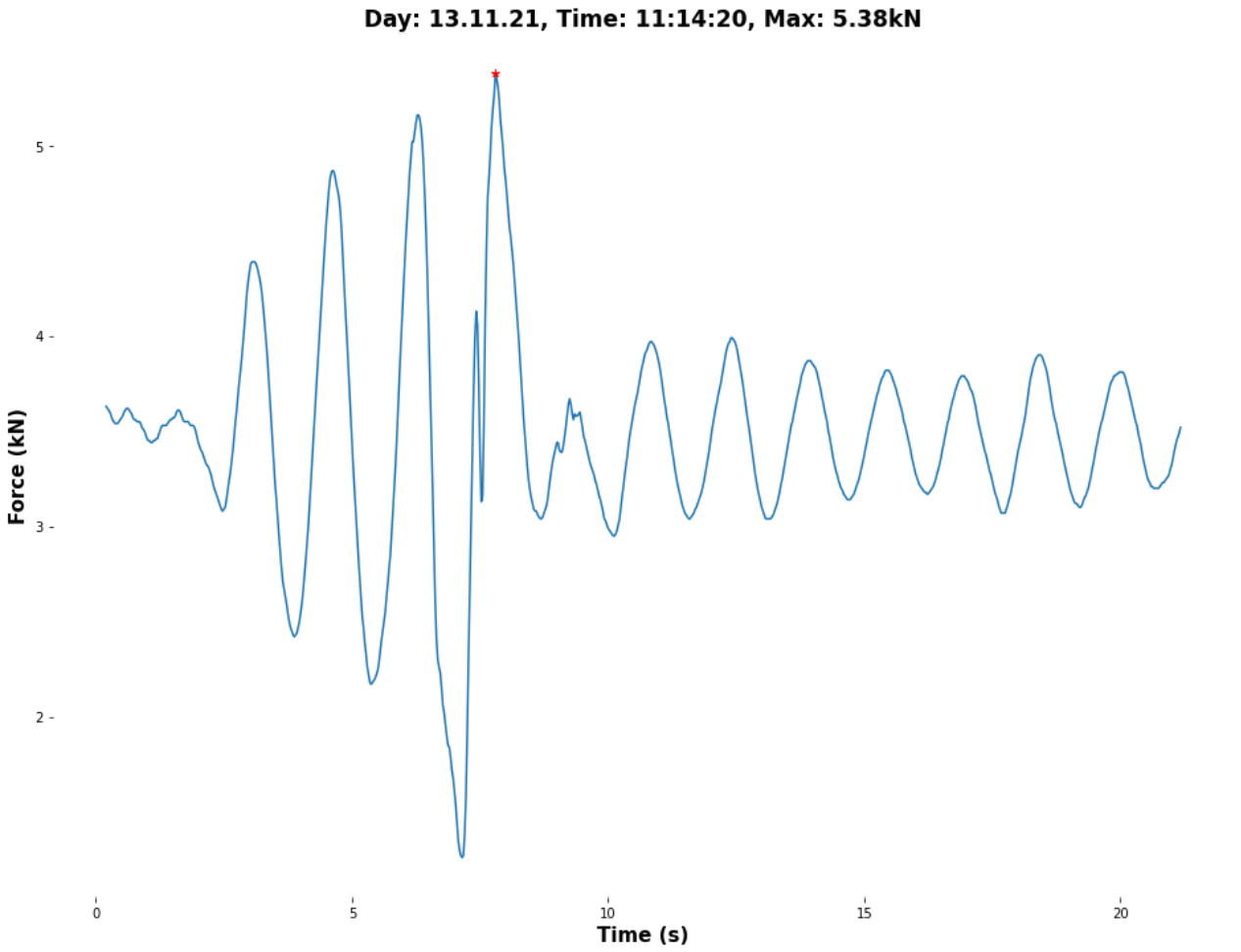

Day: 13.11.21, Time: 11:02:28, Max: 6.79kN
Force (kN)
Time (s)
7
6
5
4
3
2
1
0
5
10
15
20

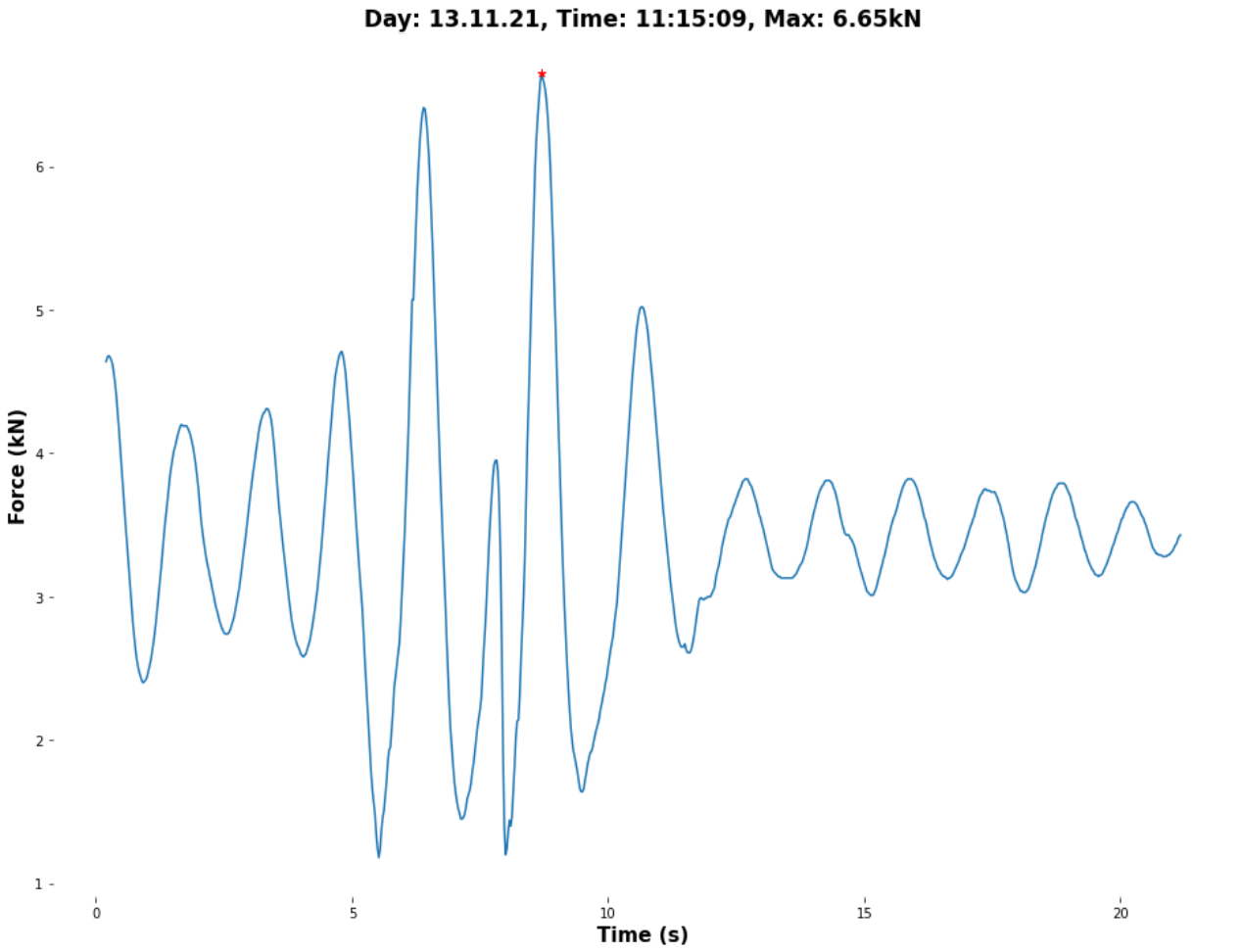

Day: 13.11.21, Time: 11:02:53, Max: 6.61kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

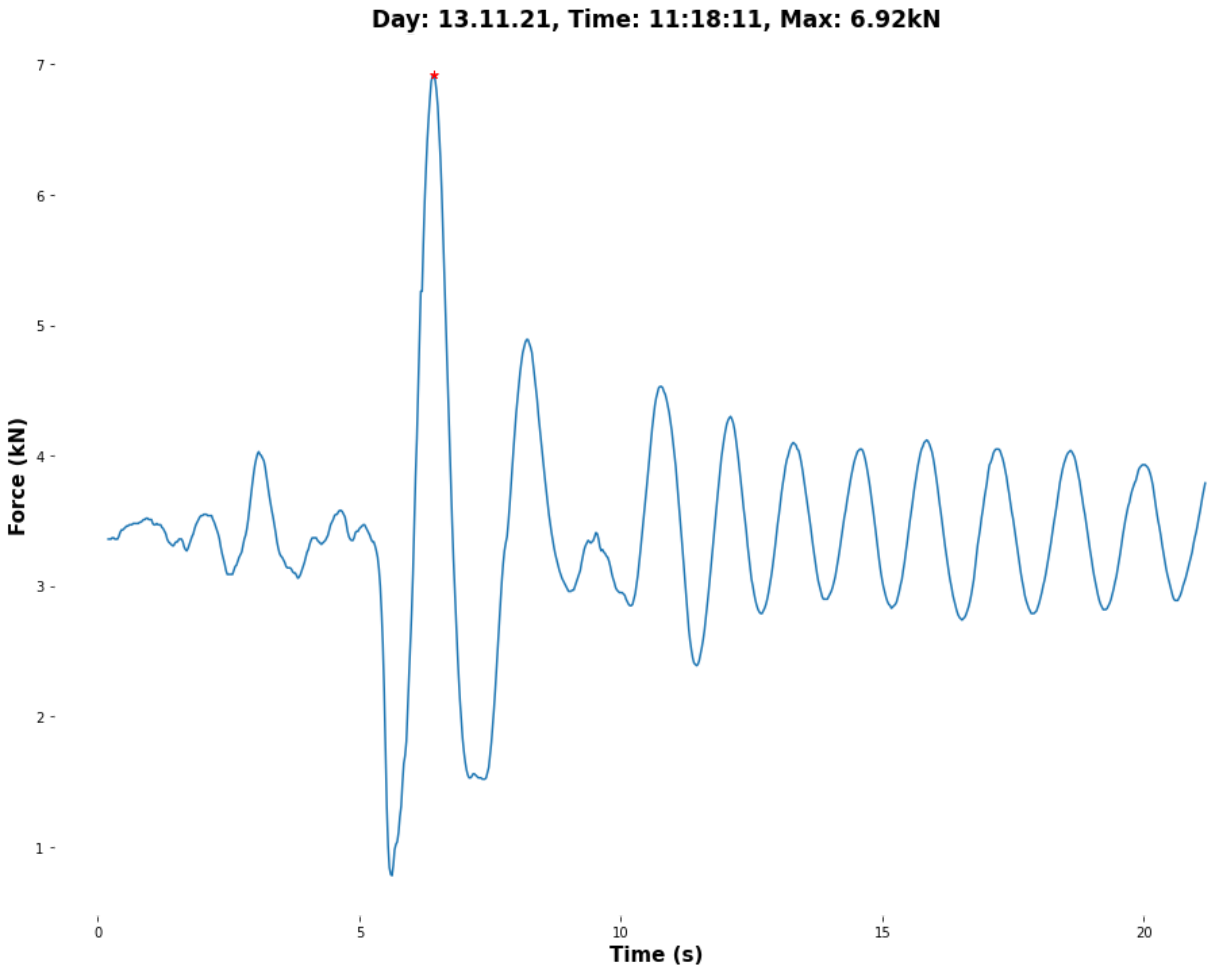

Day: 13.11.21, Time: 11:04:26, Max: 6.61kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

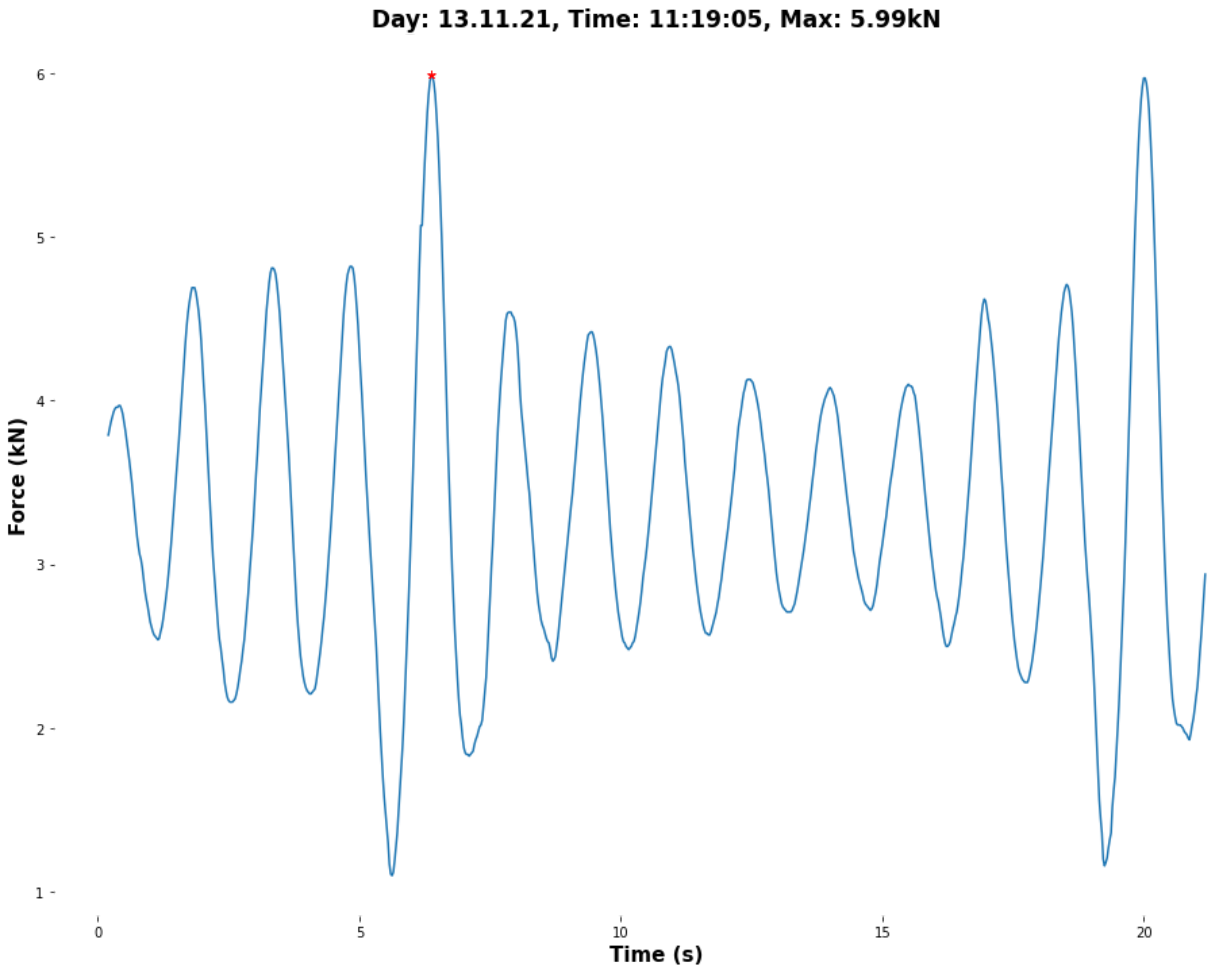

Day: 13.11.21, Time: 11:05:44, Max: 5.58kN
Force (kN)
Time (s)
1
2
3
4
5
0
5
10
15
20

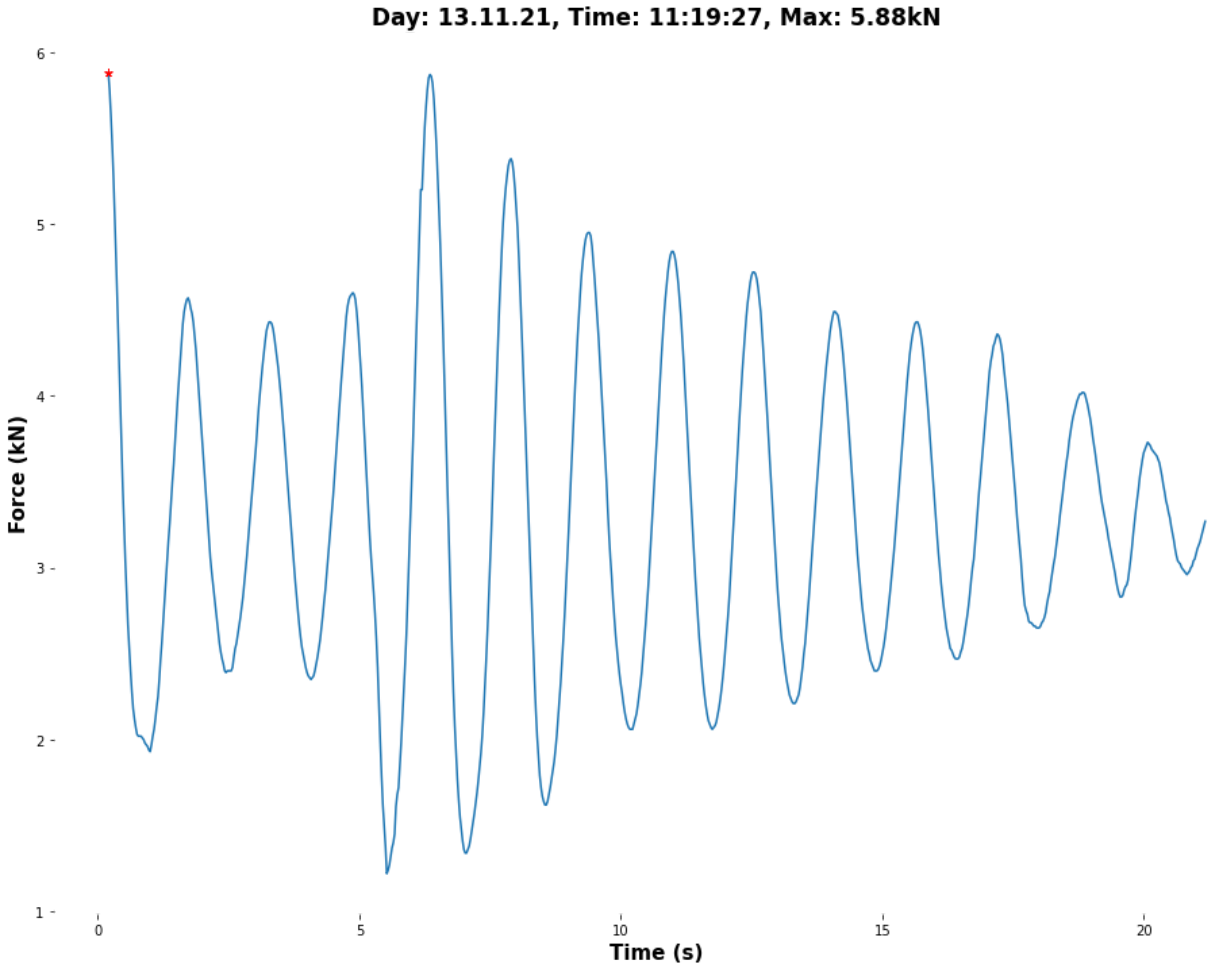

Day: 13.11.21, Time: 11:07:02, Max: 6.66kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

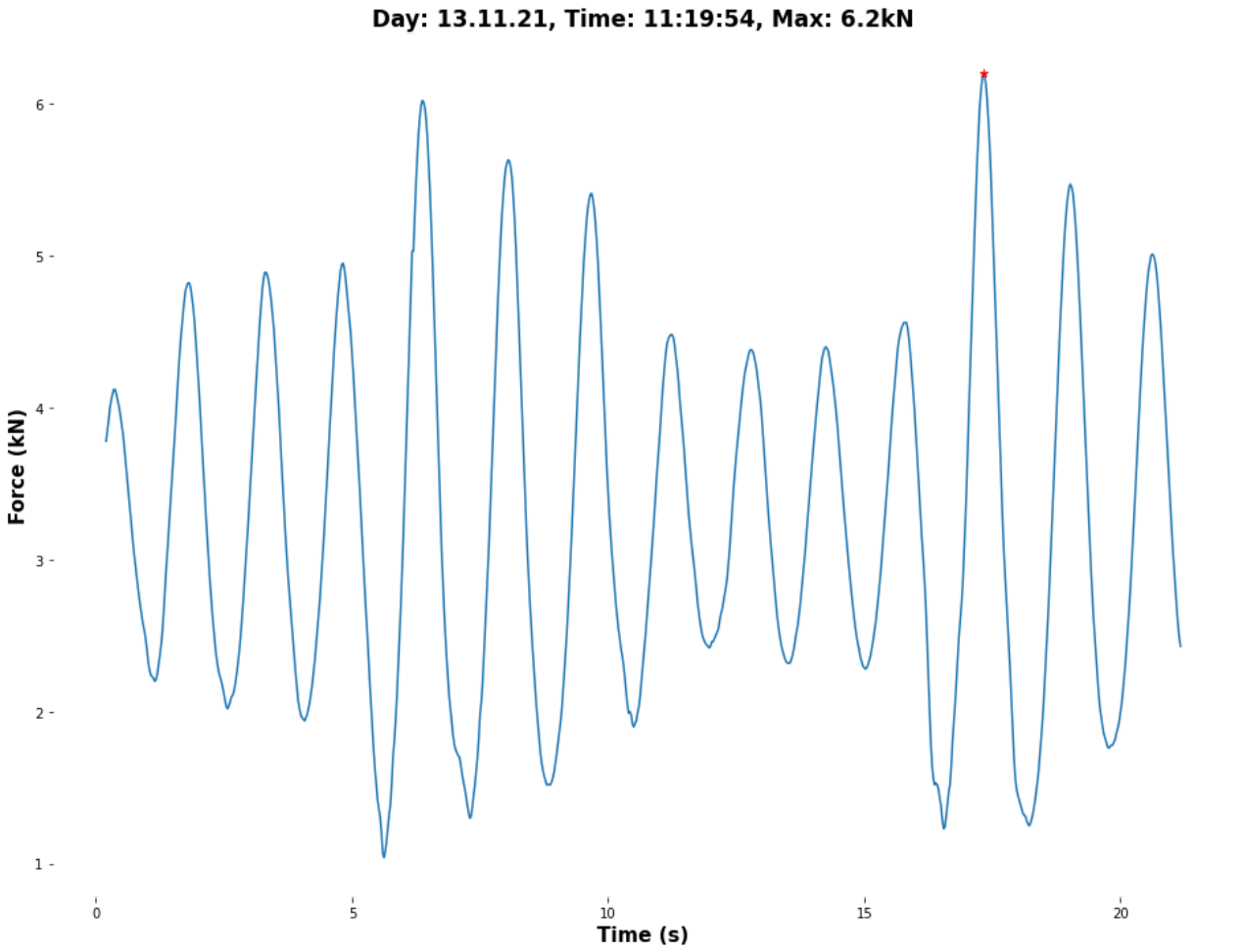

Day: 13.11.21, Time: 11:14:20, Max: 5.38kN
Force (kN)
5
4
3
2
0
5
10
15
20
Time (s)

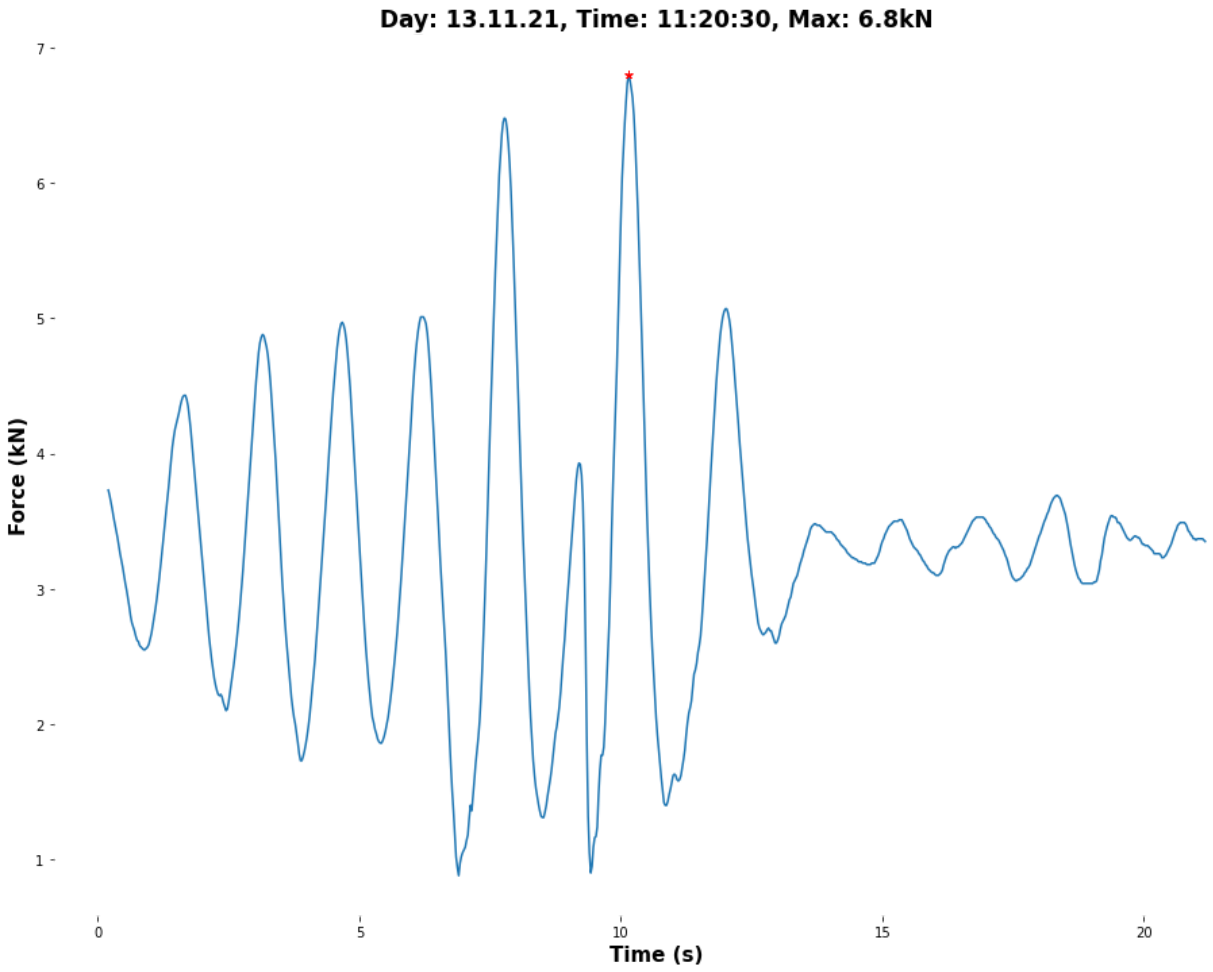

Day: 13.11.21, Time: 11:15:09, Max: 6.65kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

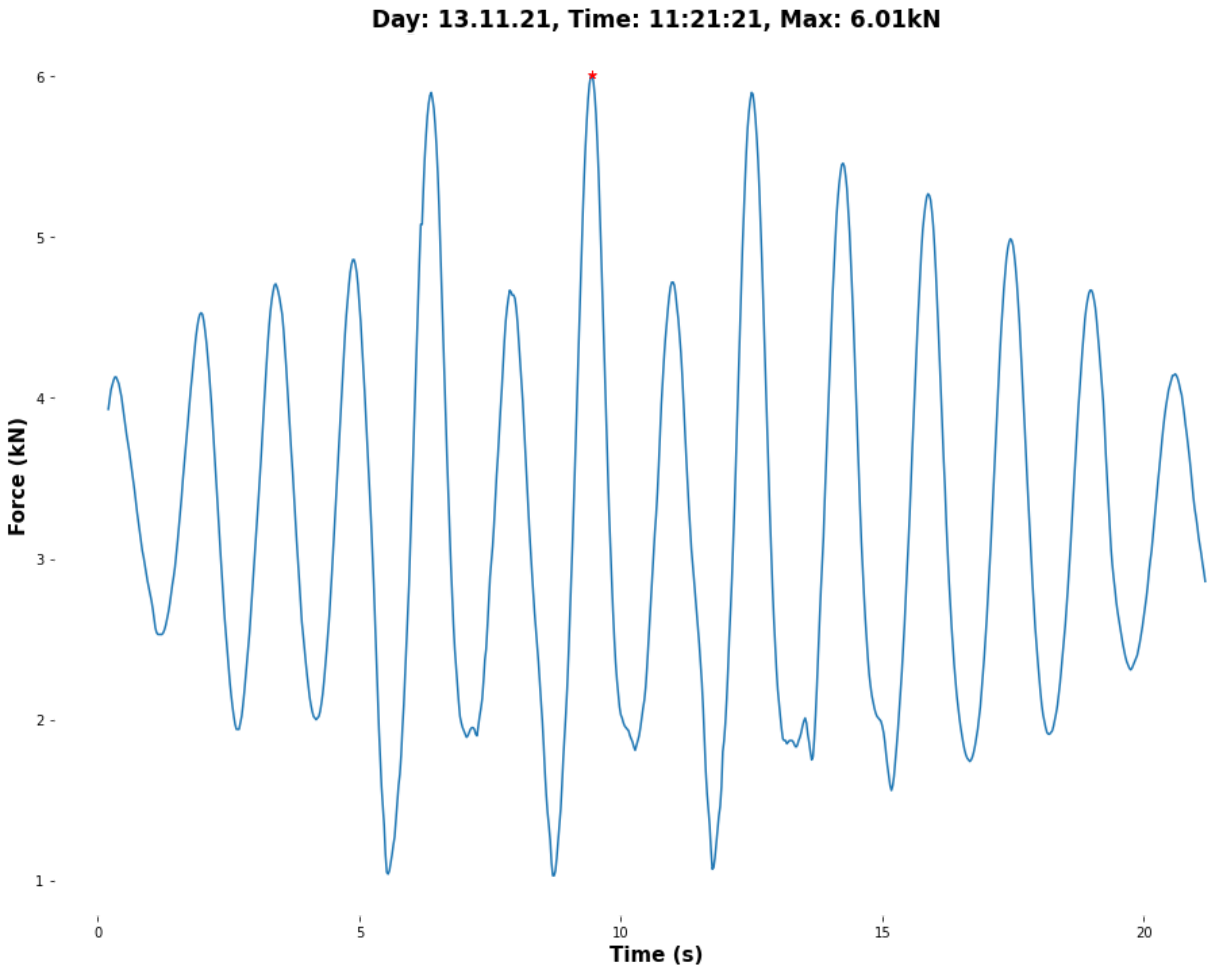

Day: 13.11.21, Time: 11:18:11, Max: 6.92kN
Force (kN)
Time (s)
7
6
5
4
3
2
1
0
5
10
15
20

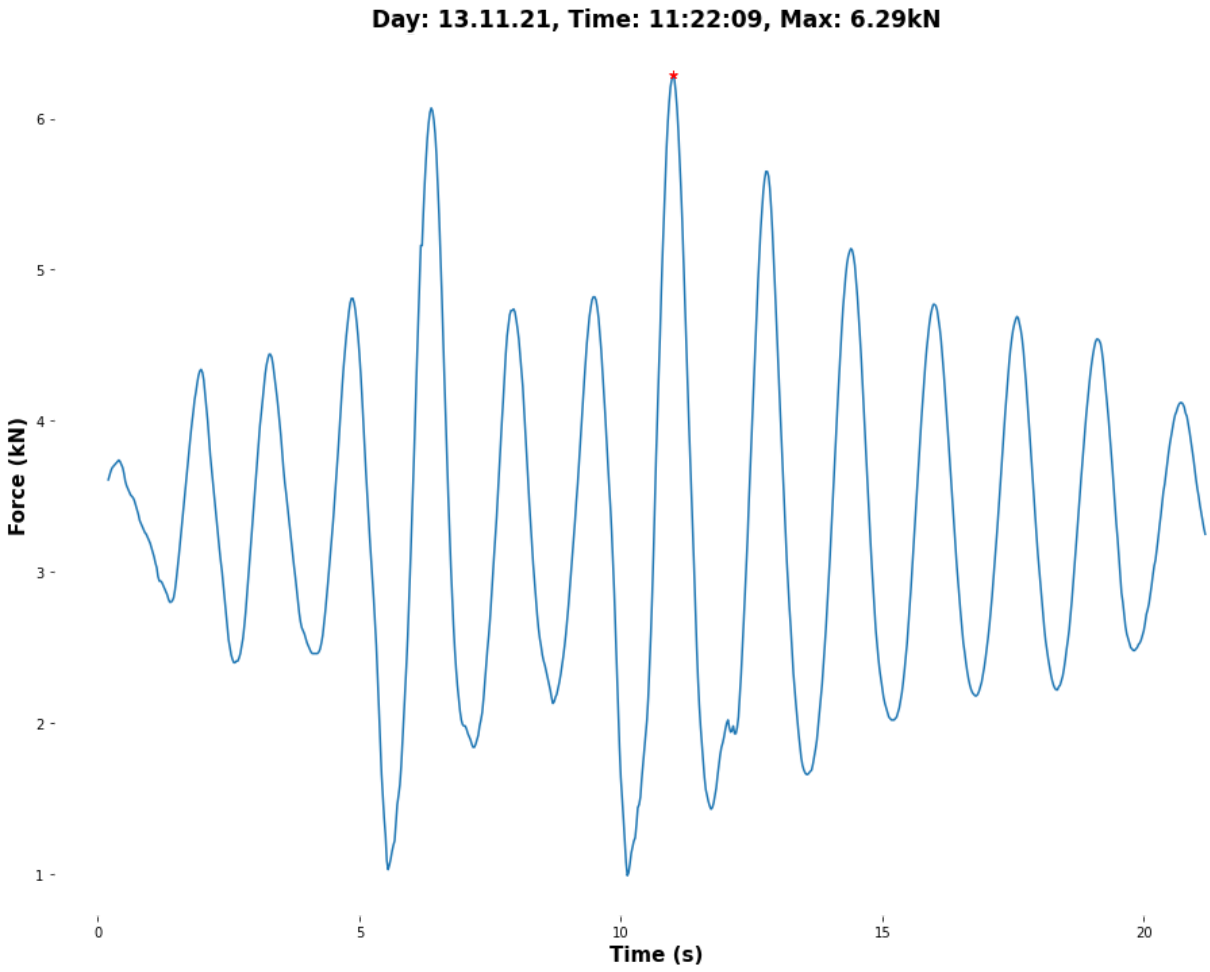

Day: 13.11.21, Time: 11:19:05, Max: 5.99kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

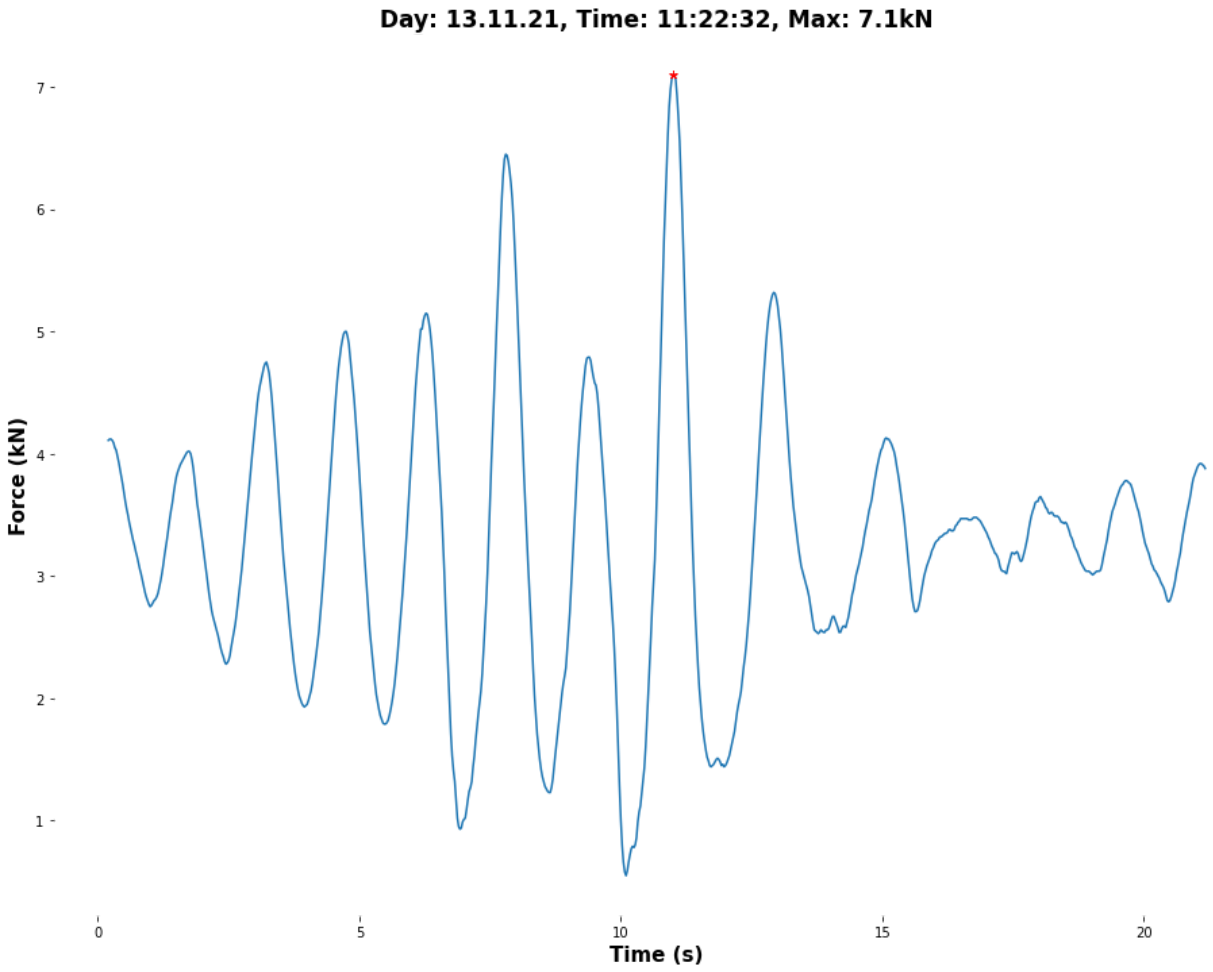

Day: 13.11.21, Time: 11:19:27, Max: 5.88kN
Force (kN)
Time (s)
6
5
4
3
2
1
0
5
10
15
20

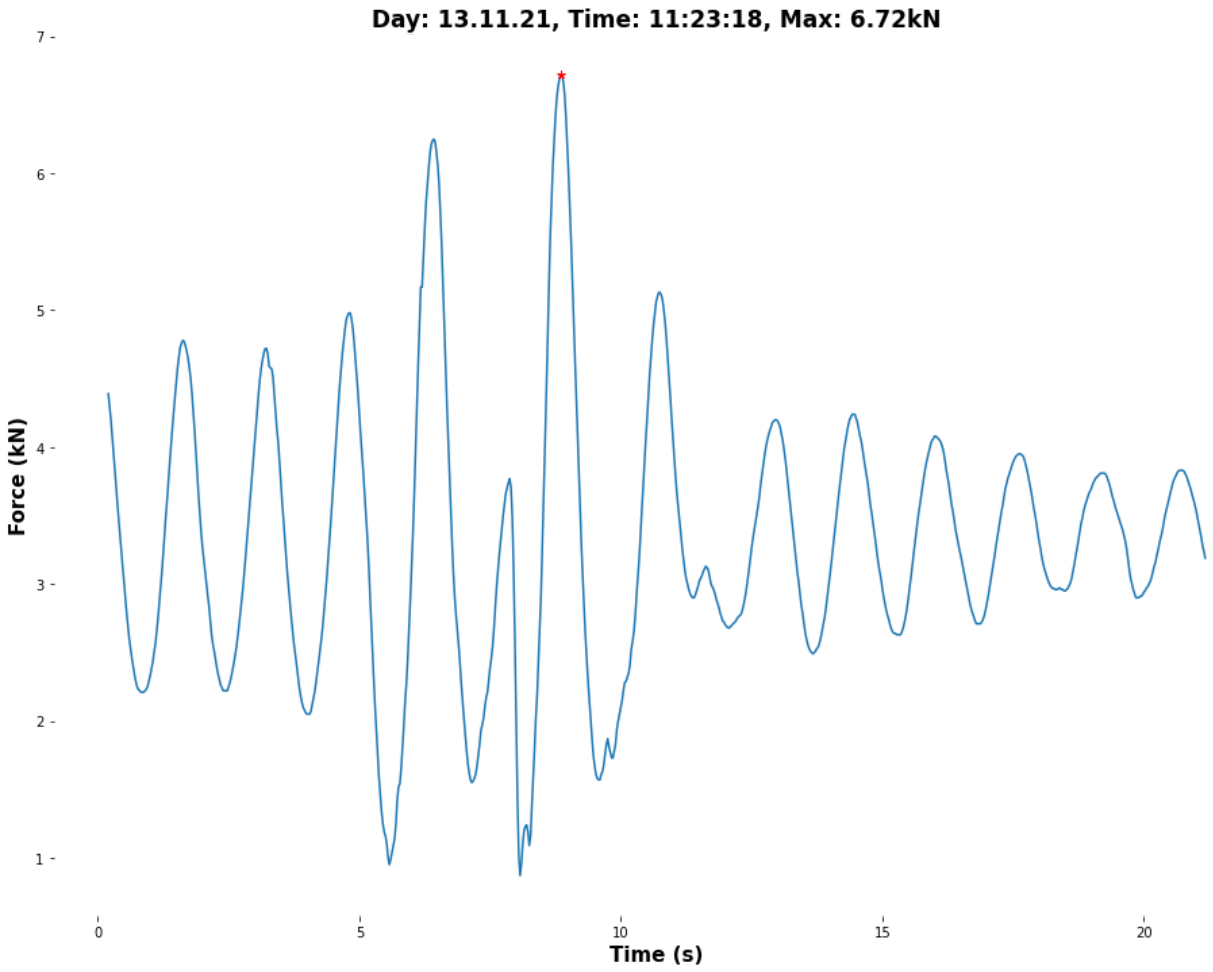

Day: 13.11.21, Time: 11:19:54, Max: 6.2kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

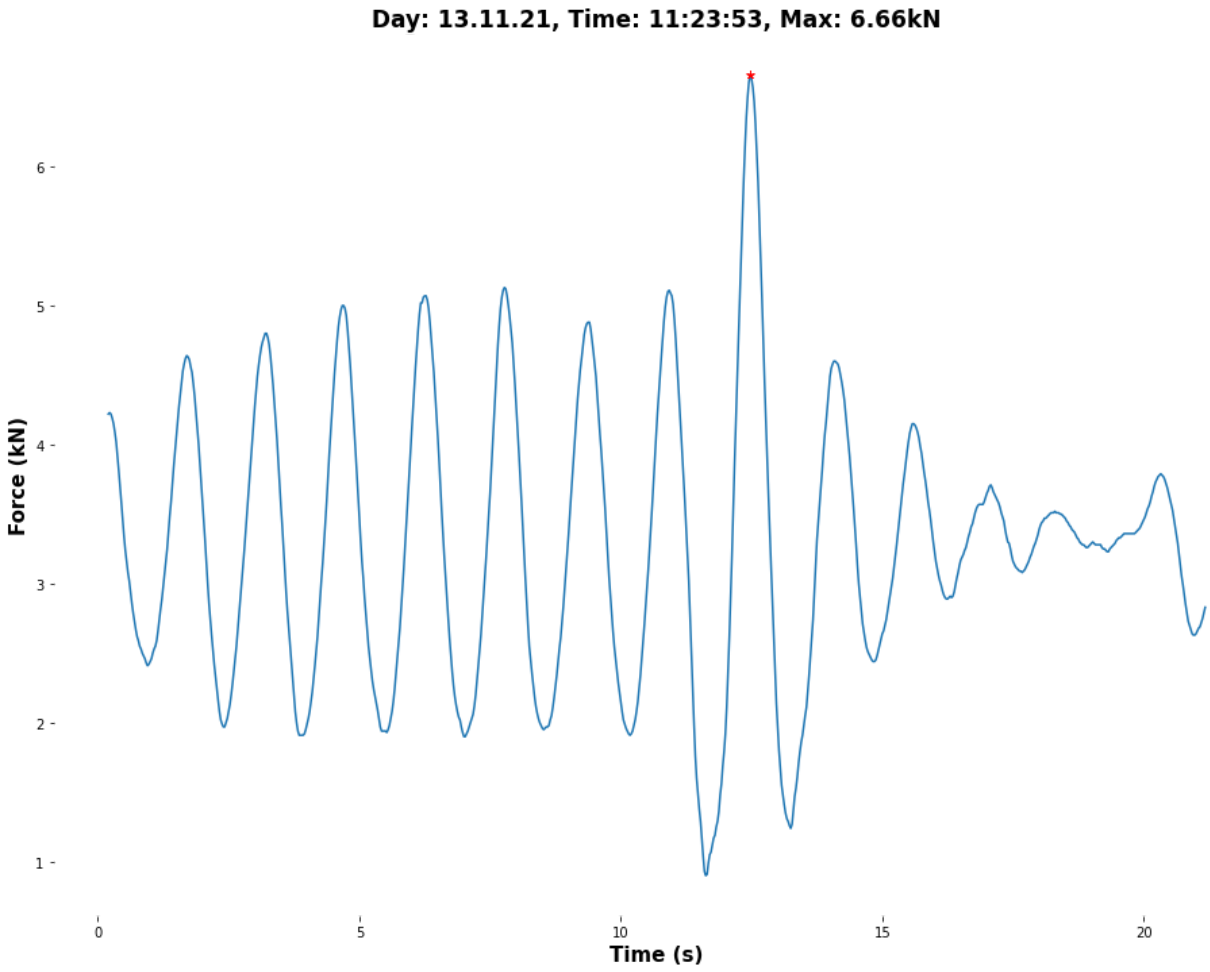

Day: 13.11.21, Time: 11:20:30, Max: 6.8kN
Force (kN)
Time (s)
7
6
5
4
3
2
1
0
5
10
15
20

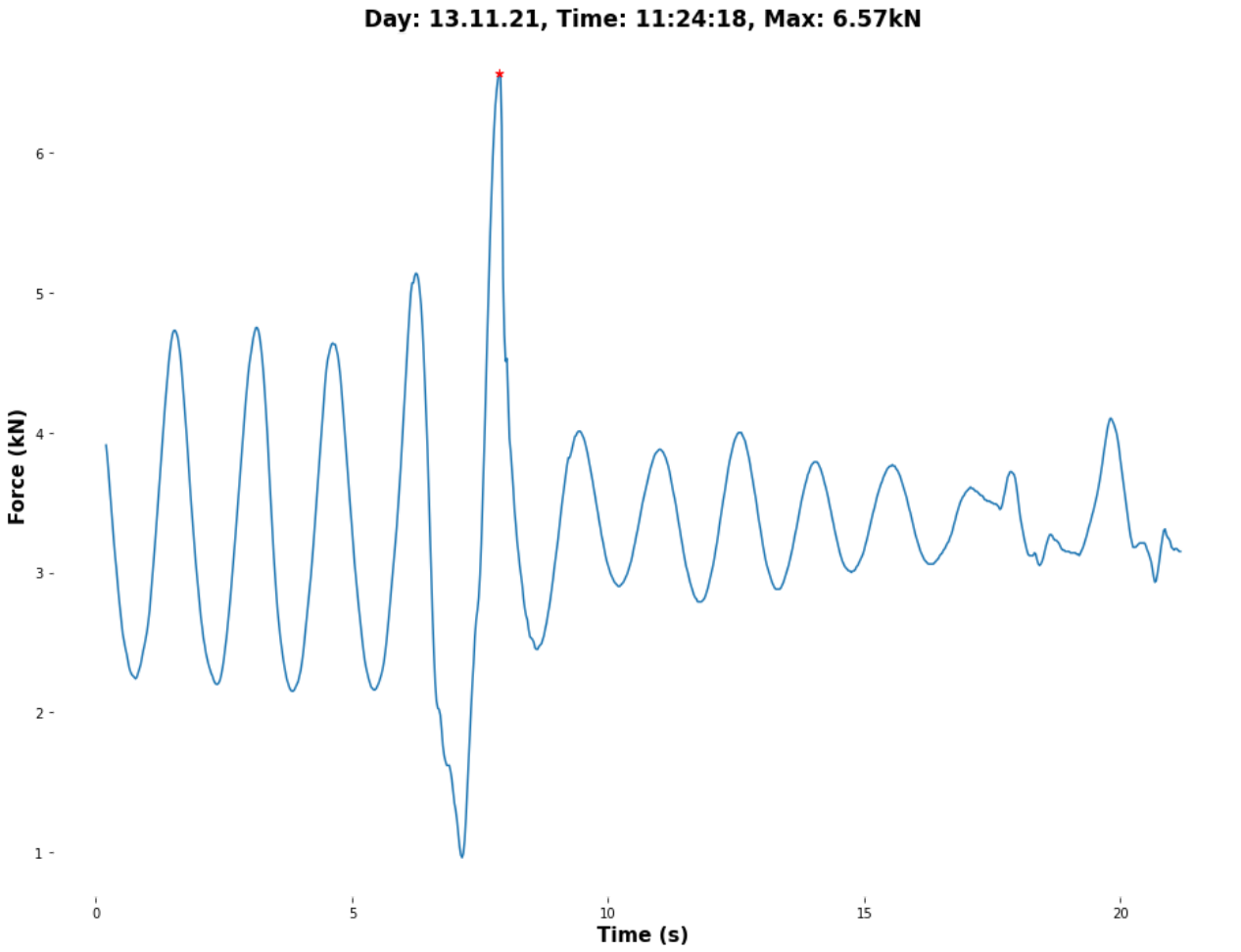

Day: 13.11.21, Time: 11:21:21, Max: 6.01kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

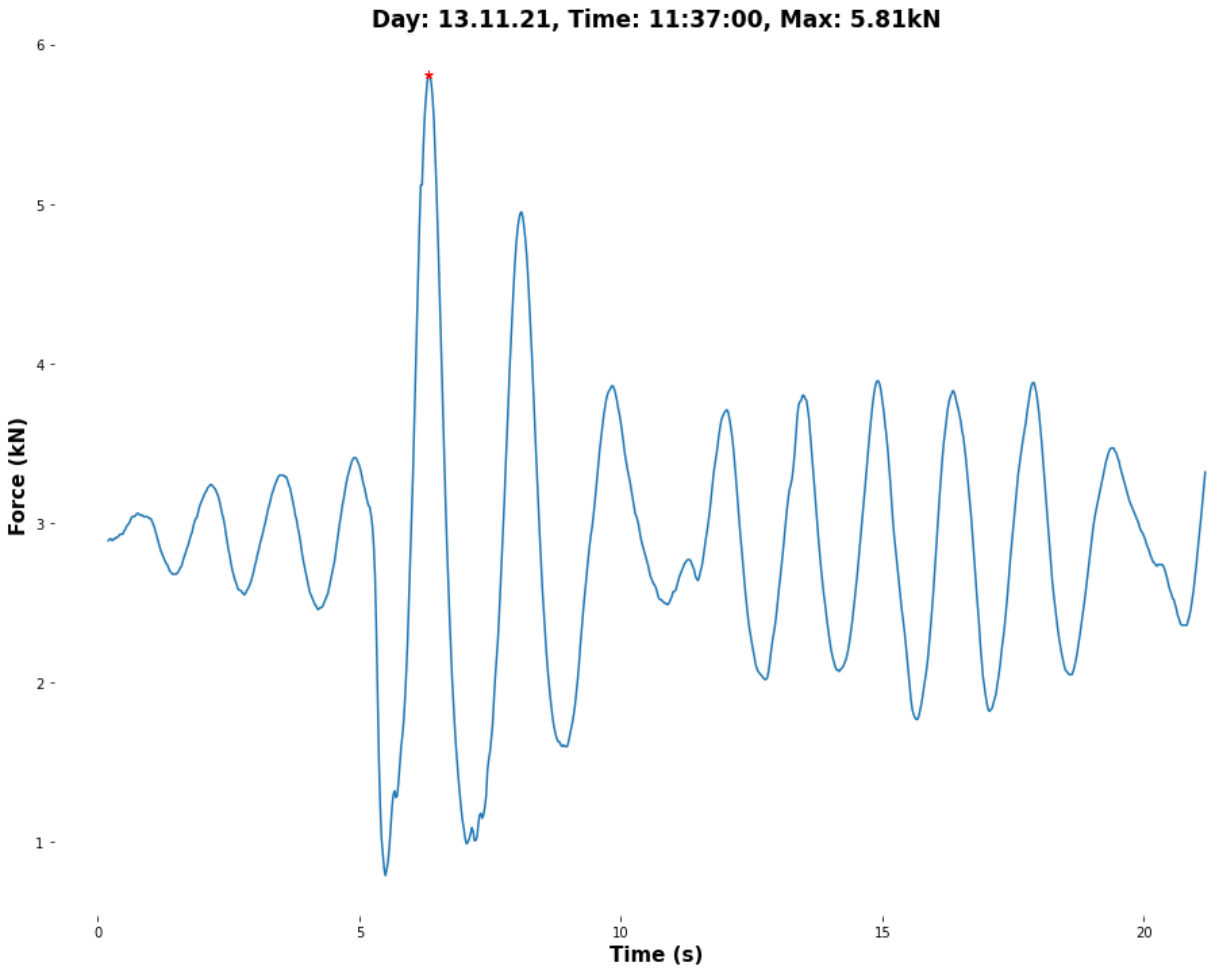

Day: 13.11.21, Time: 11:22:09, Max: 6.29kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

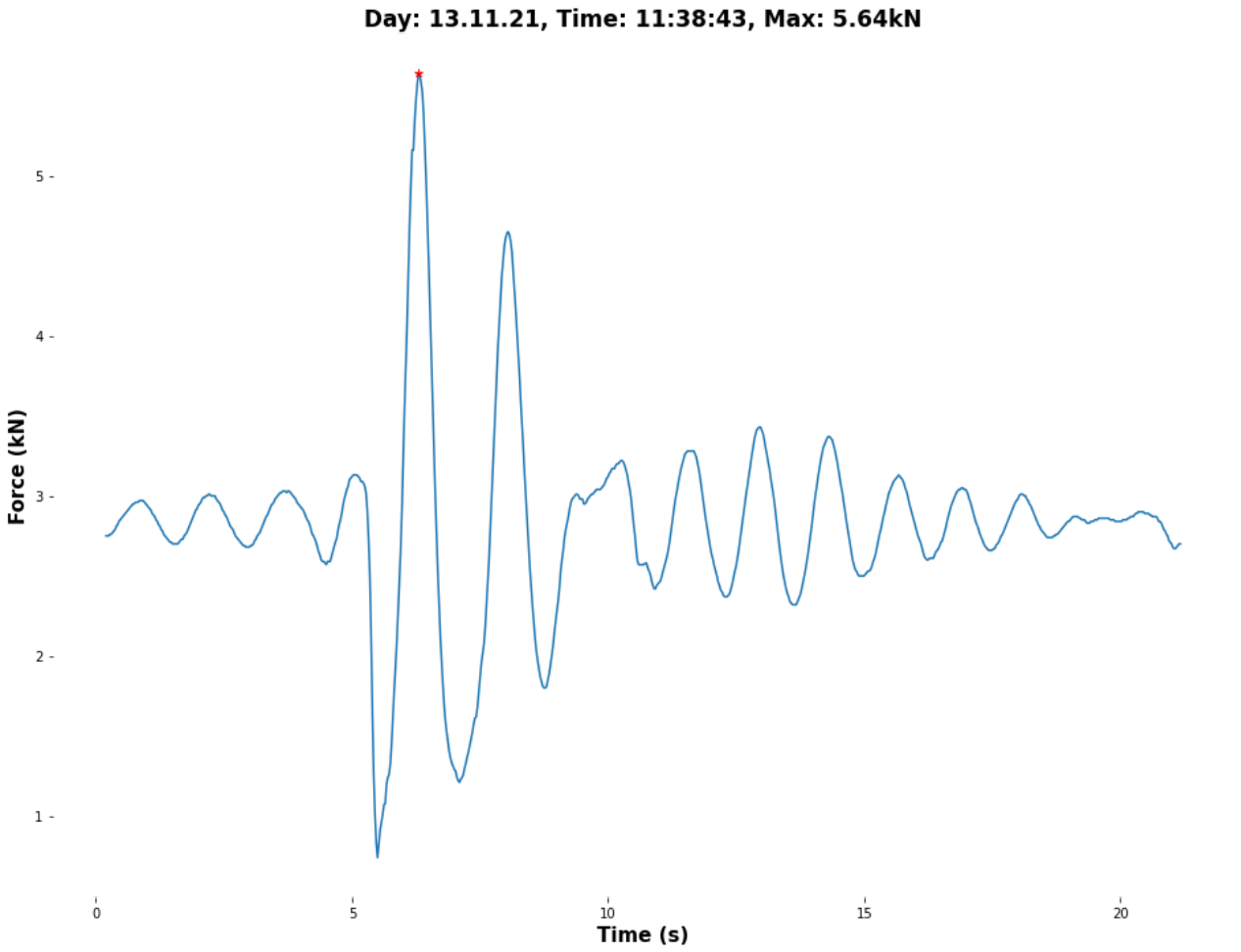

Day: 13.11.21, Time: 11:22:32, Max: 7.1kN
Force (kN)
Time (s)
1
2
3
4
5
6
7
0
5
10
15
20

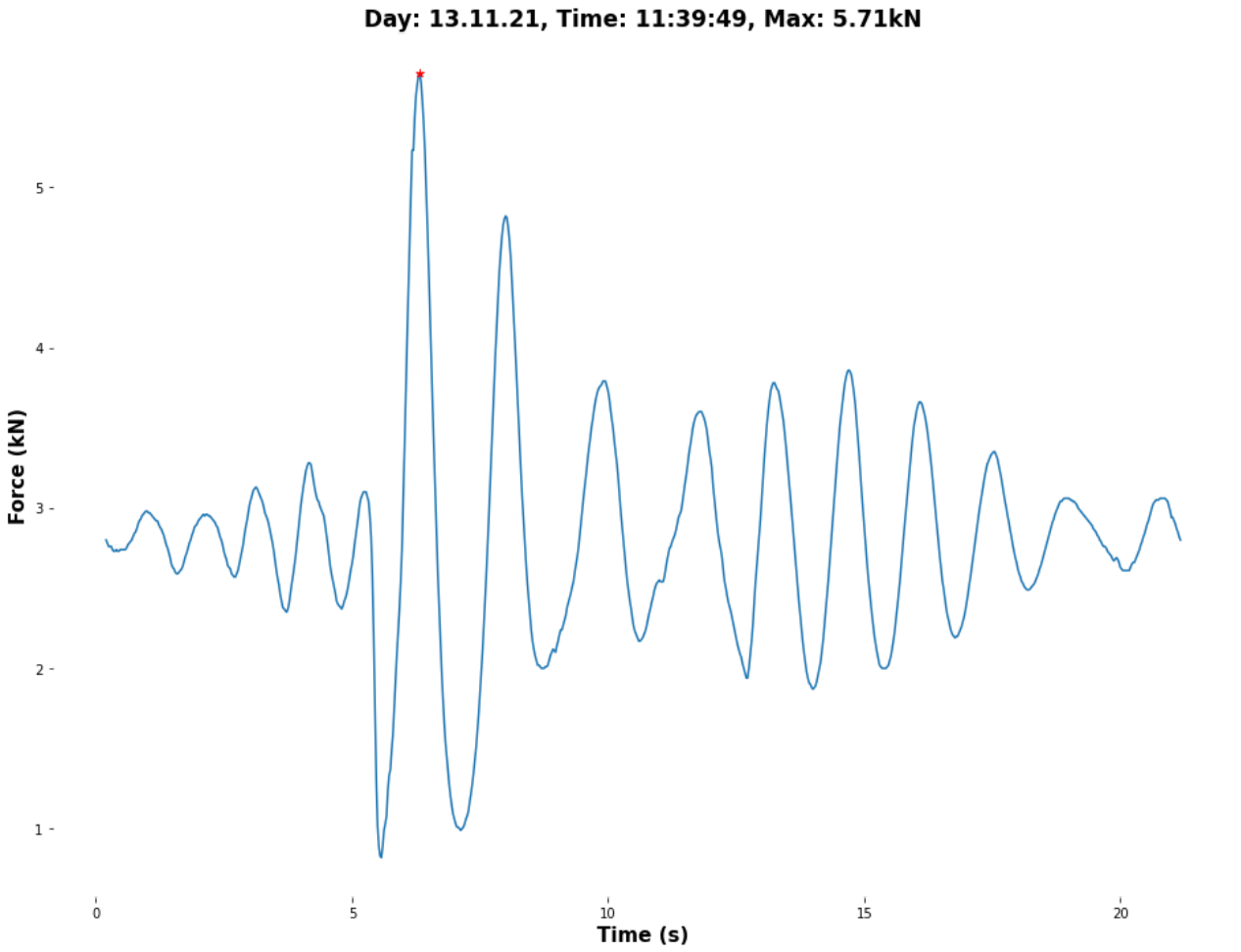

Day: 13.11.21, Time: 11:23:18, Max: 6.72kN
Force (kN)
Time (s)
7
6
5
4
3
2
1
0
5
10
15
20

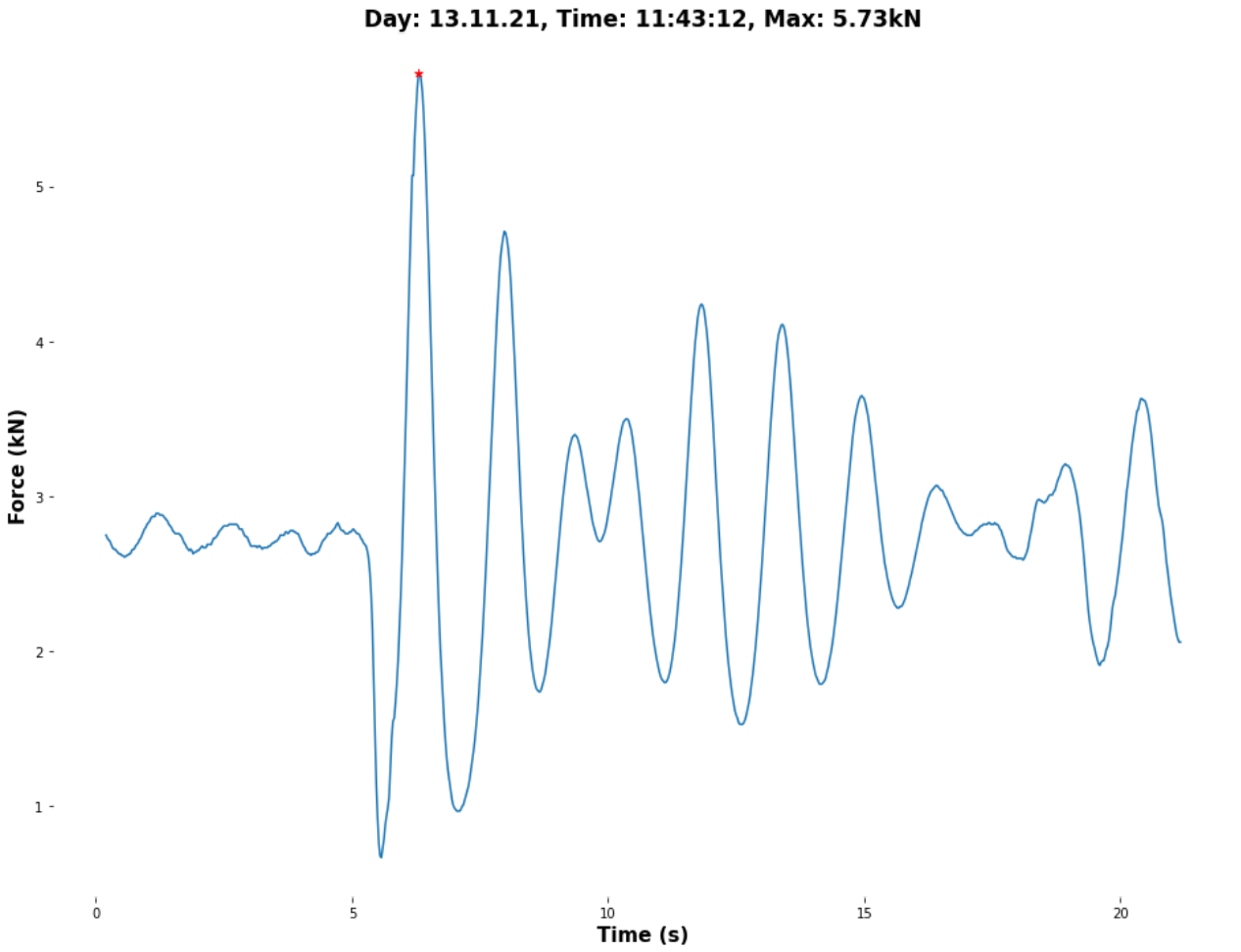

Day: 13.11.21, Time: 11:23:53, Max: 6.66kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

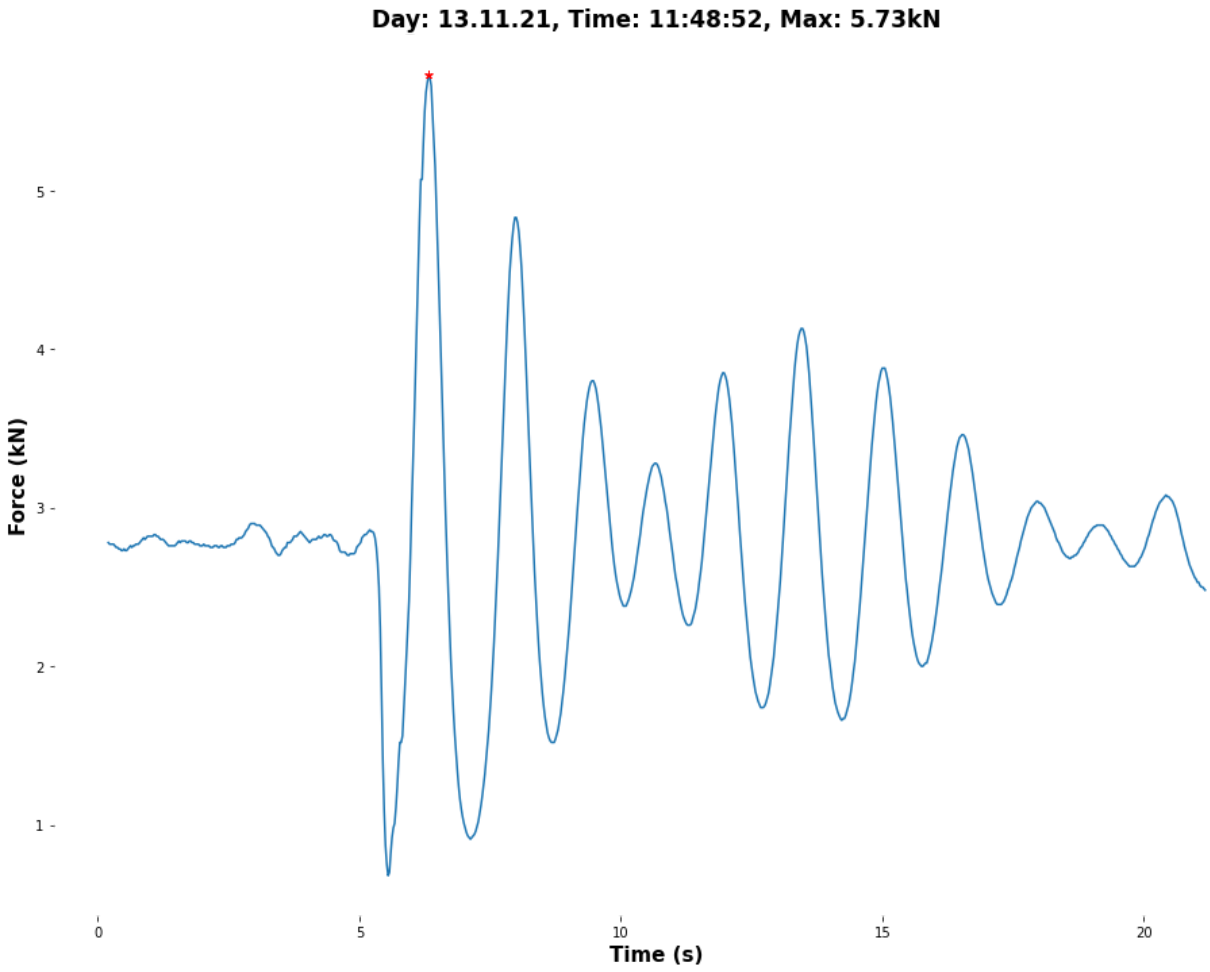

Day: 13.11.21, Time: 11:24:18, Max: 6.57kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

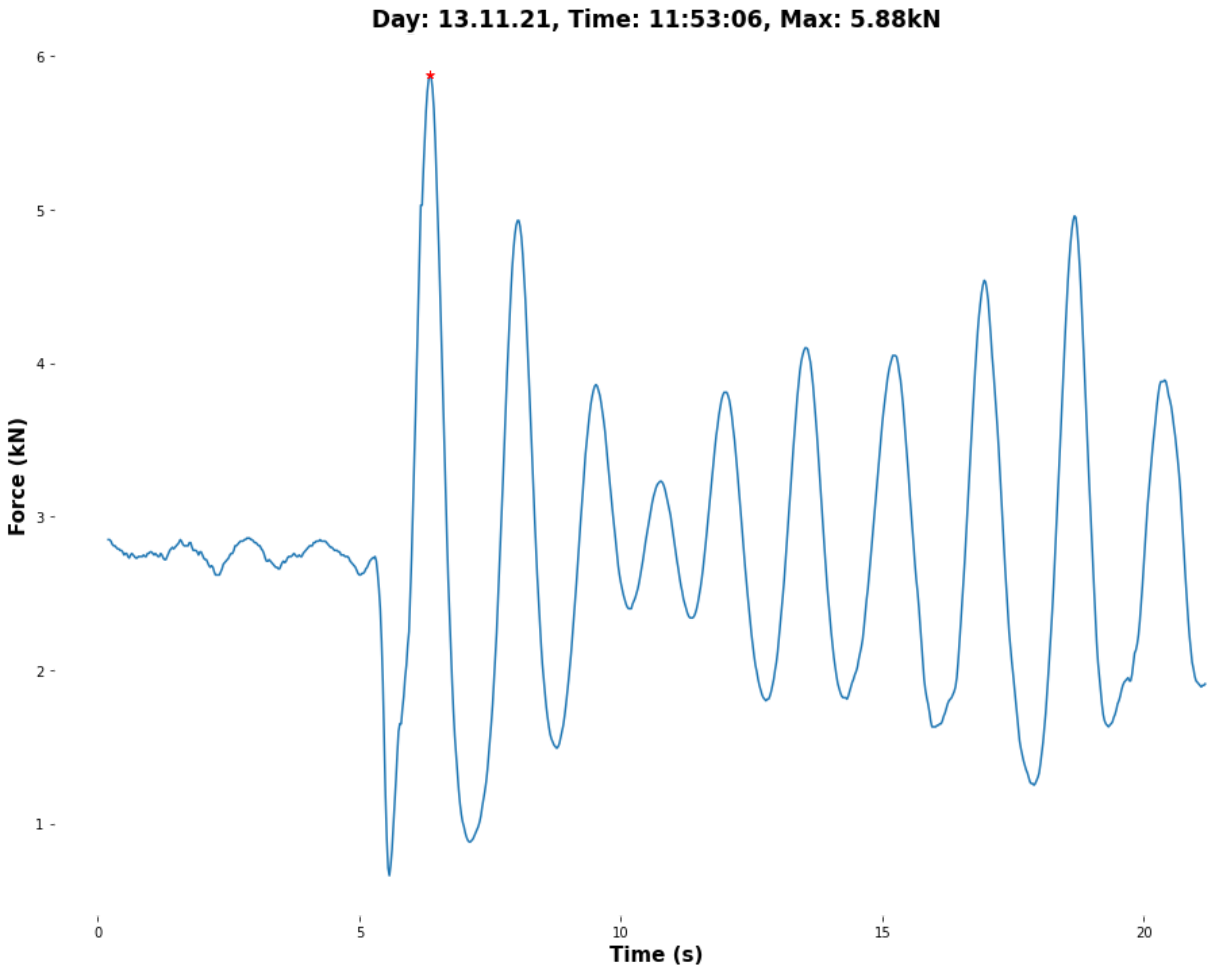

Day: 13.11.21, Time: 11:37:00, Max: 5.81kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

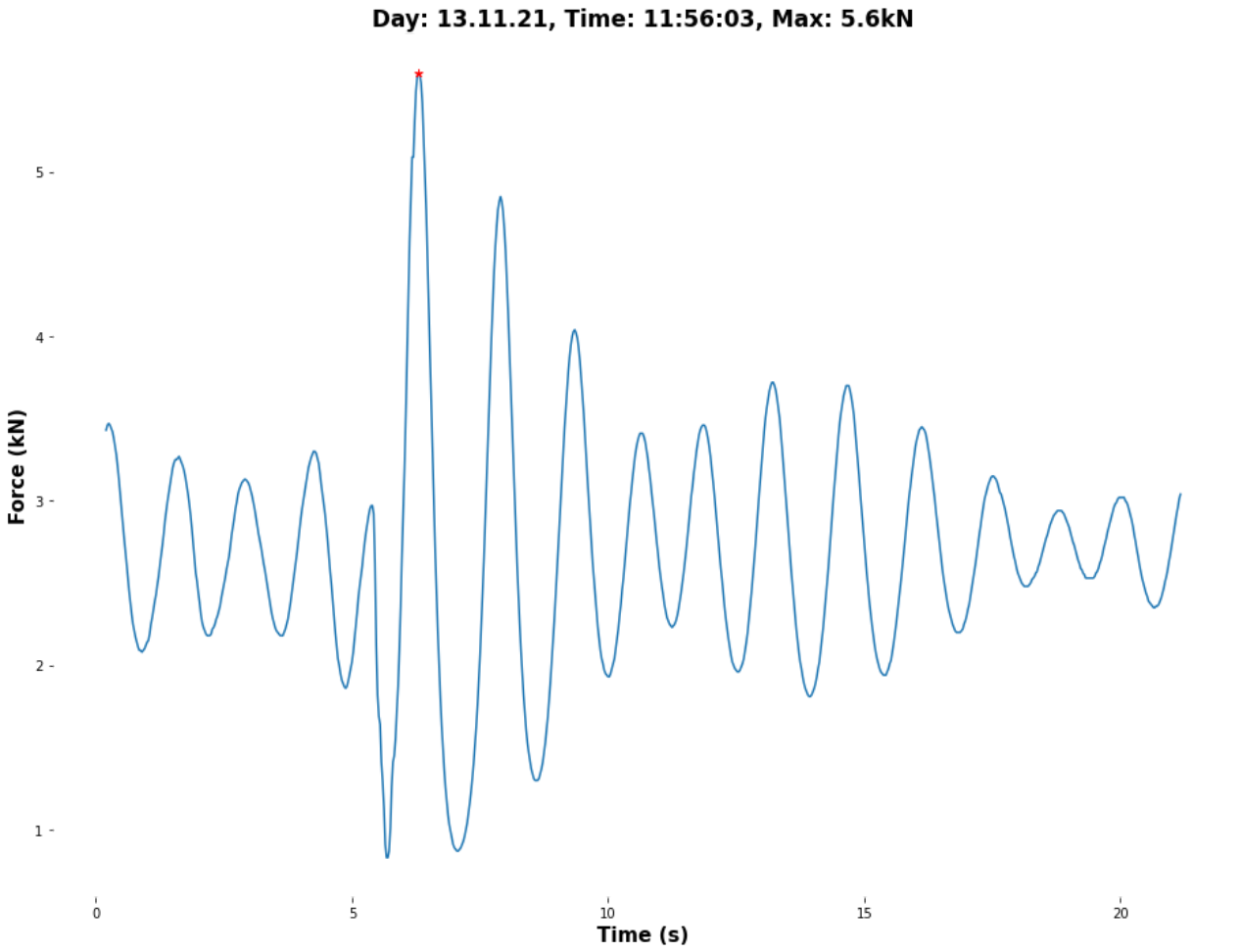

Day: 13.11.21, Time: 11:38:43, Max: 5.64kN
Force (kN)
5
4
3
2
1
0
5
10
15
20
Time (s)

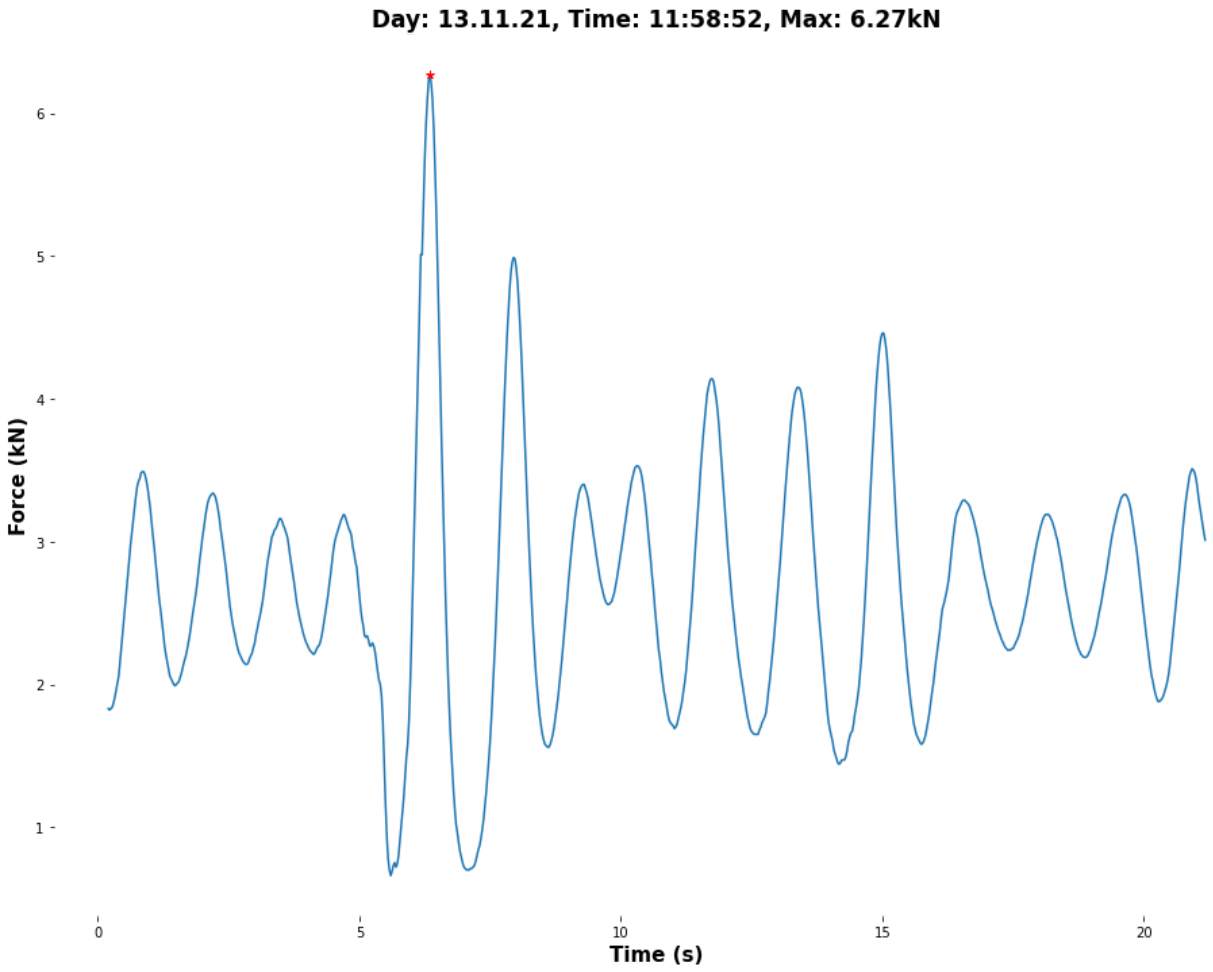

Day: 13.11.21, Time: 11:39:49, Max: 5.71kN
Force (kN)
5
4
3
2
1
0
5
10
15
20
Time (s)

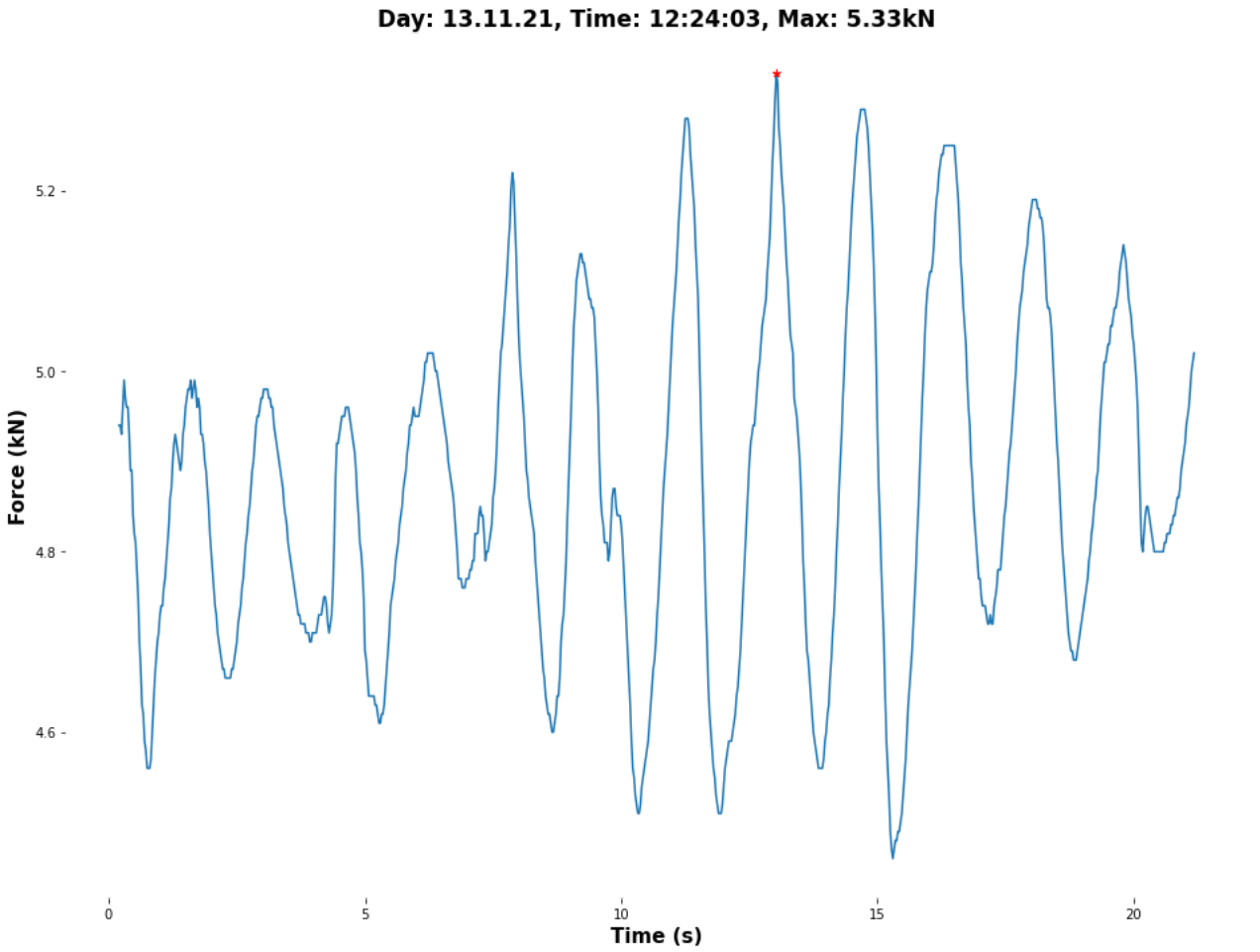

Day: 13.11.21, Time: 11:43:12, Max: 5.73kN
Force (kN)
Time (s)
1
2
3
4
5
0
5
10
15
20

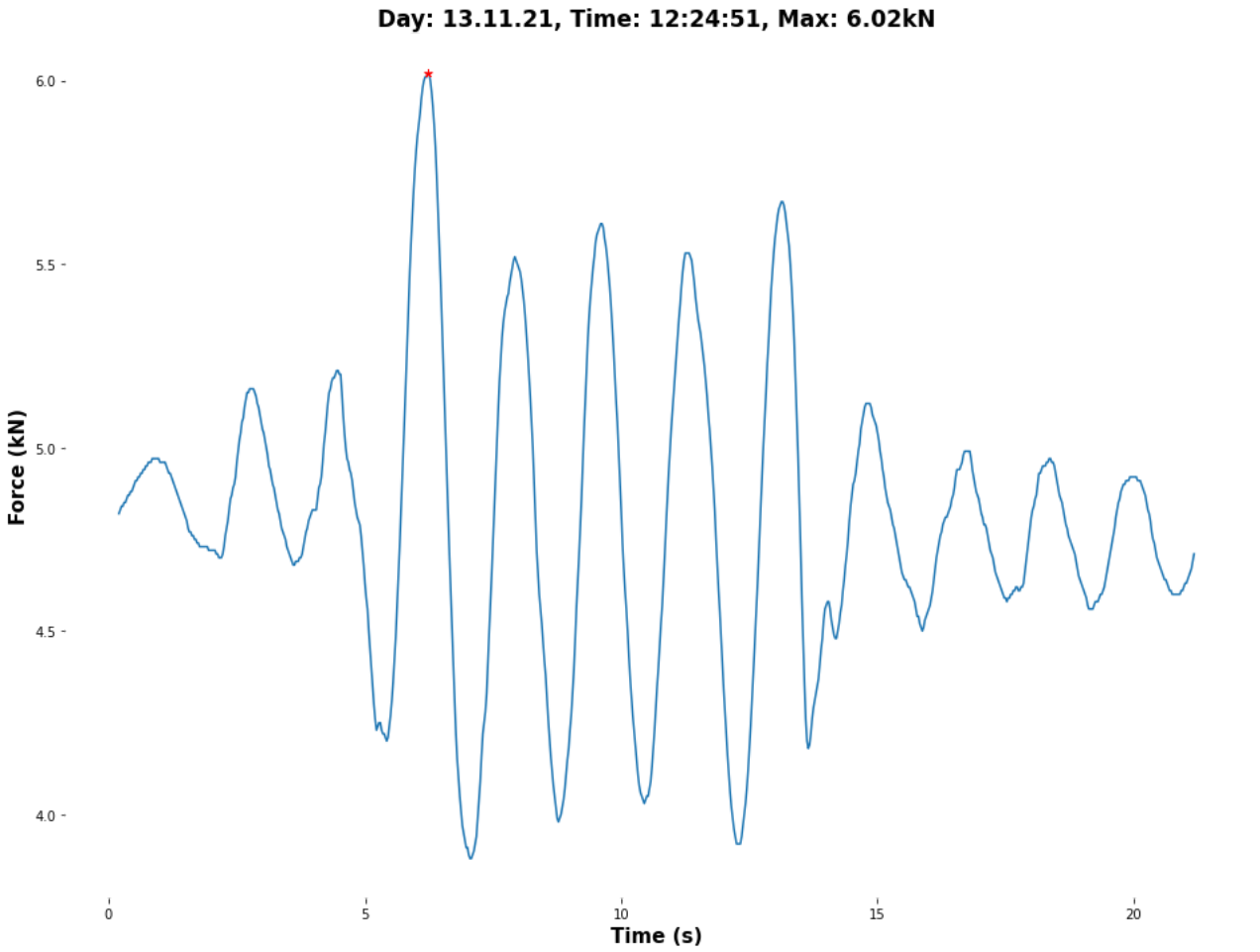

Day: 13.11.21, Time: 11:48:52, Max: 5.73kN
Force (kN)
Time (s)
1
2
3
4
5
0
5
10
15
20

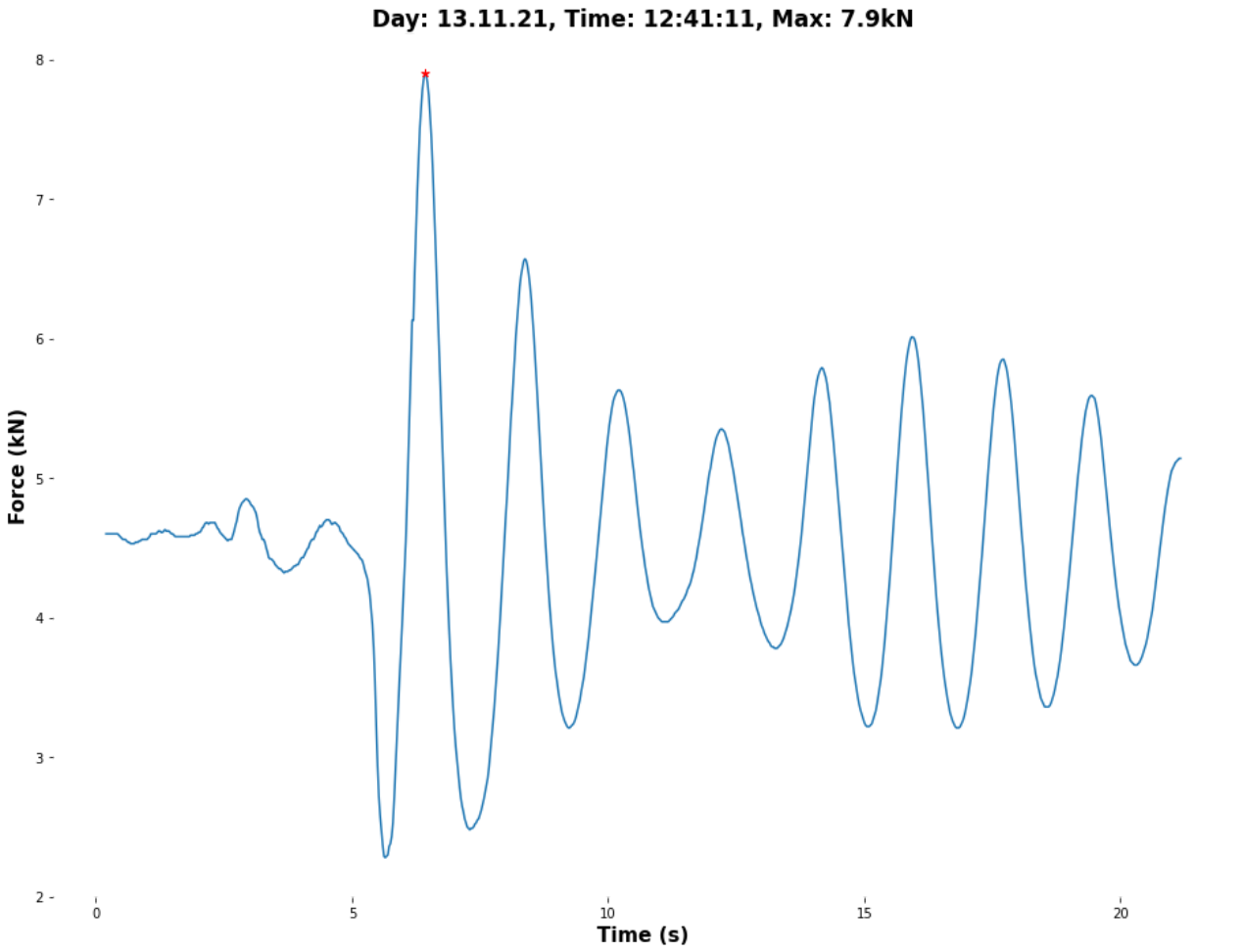

Day: 13.11.21, Time: 11:53:06, Max: 5.88kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

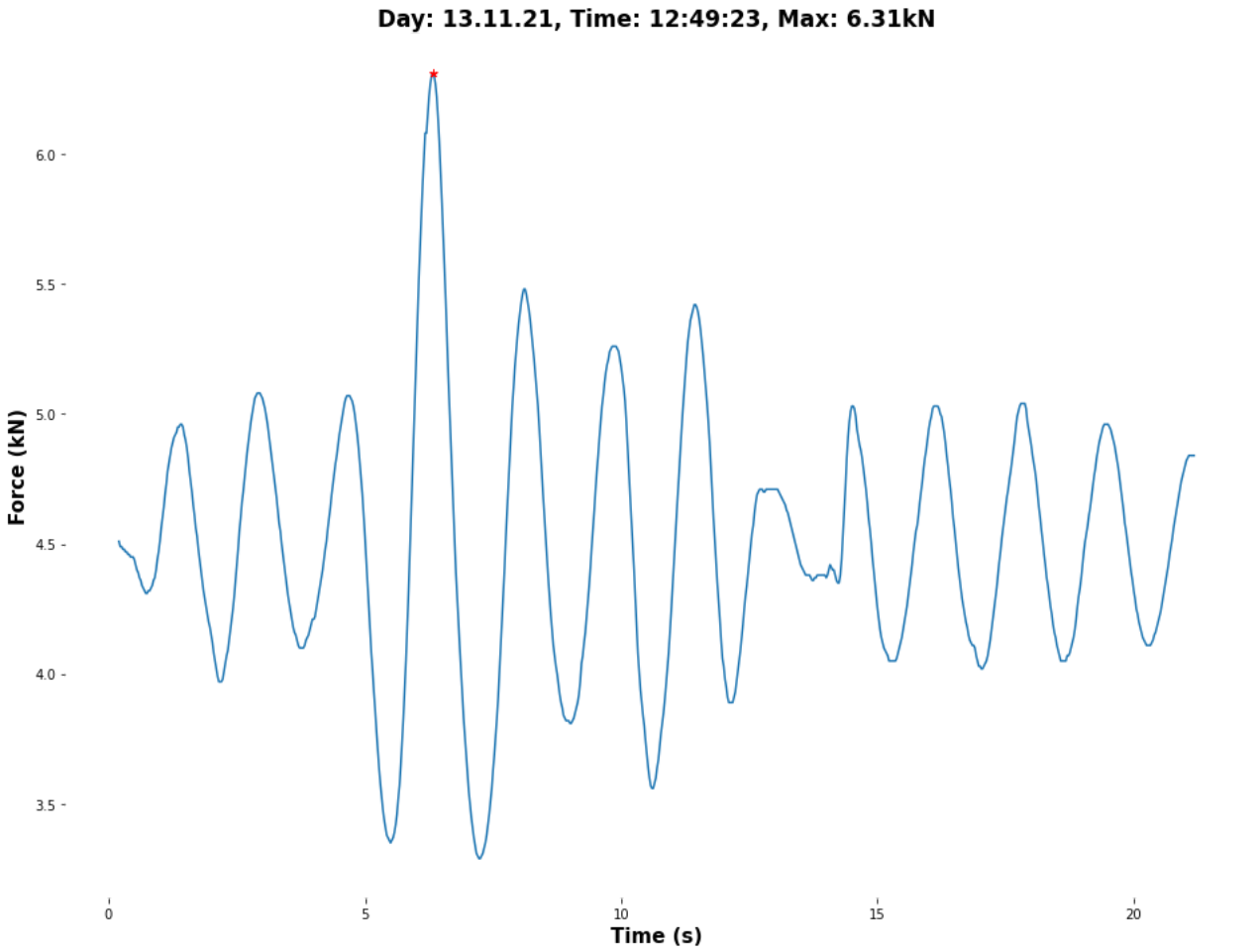

Day: 13.11.21, Time: 11:56:03, Max: 5.6kN
Force (kN)
Time (s)
1
2
3
4
5
0
5
10
15
20

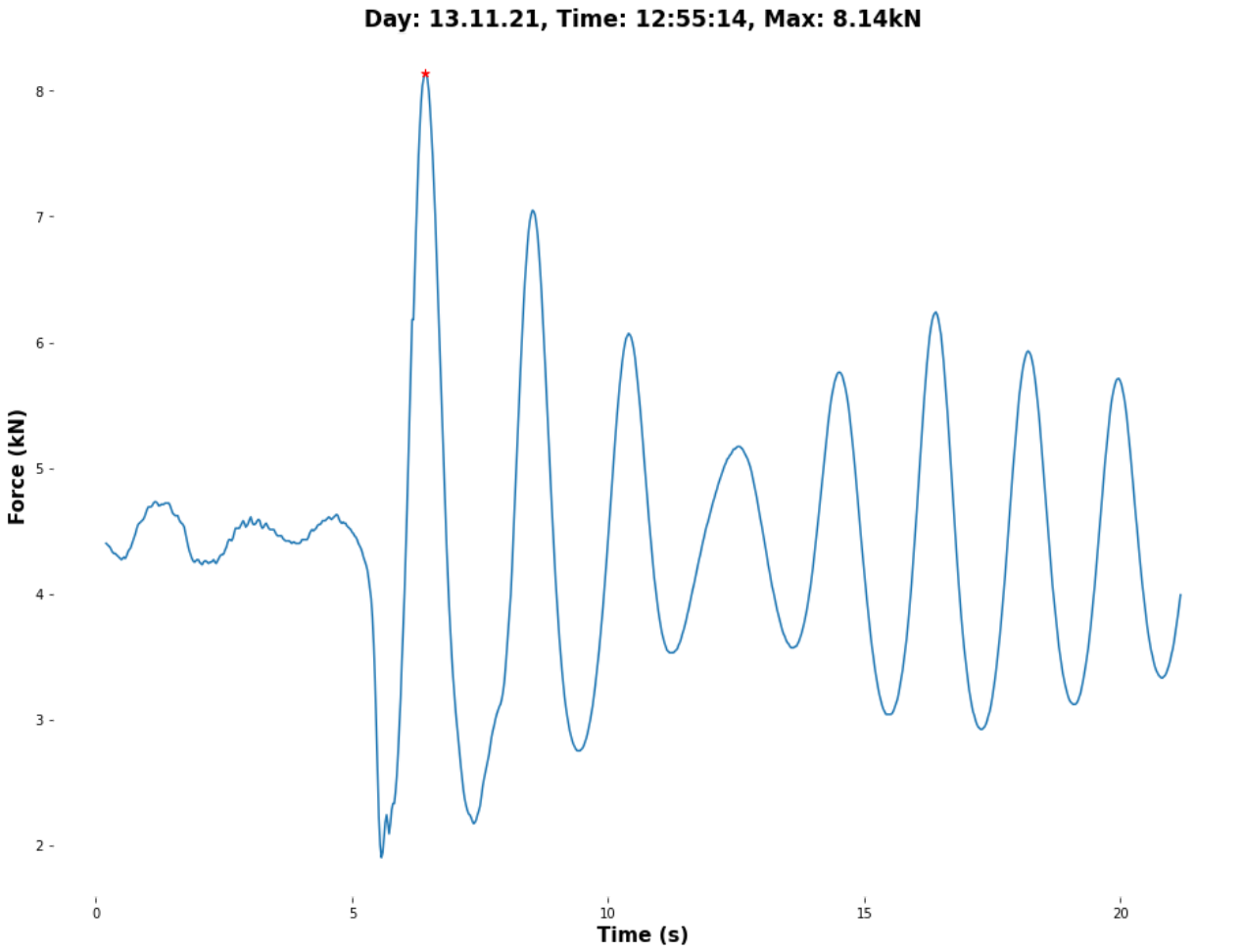

Day: 13.11.21, Time: 11:58:52, Max: 6.27kN
Force (kN)
Time (s)
1
2
3
4
5
6
0
5
10
15
20

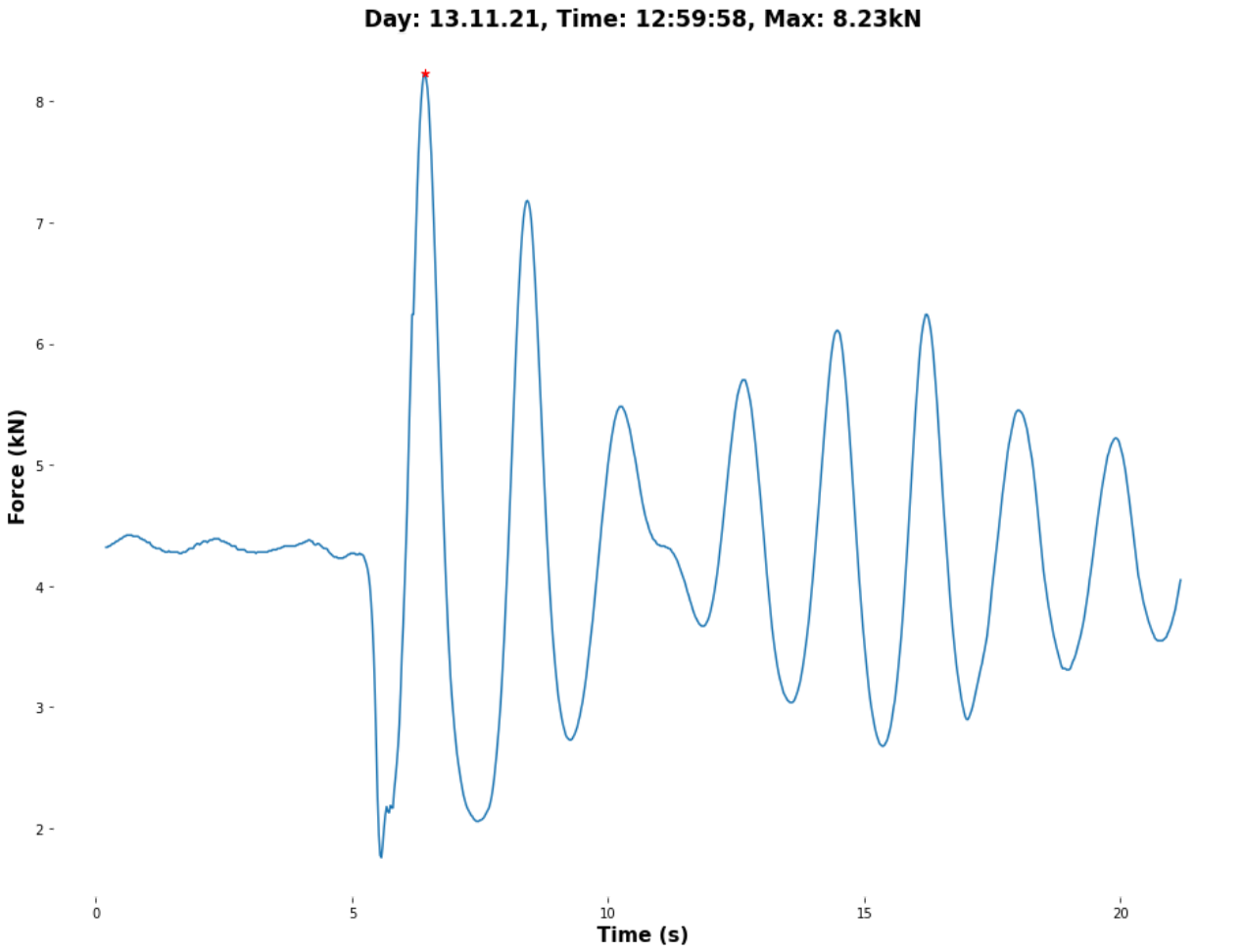

Day: 13.11.21, Time: 12:24:03, Max: 5.33kN
Force (kN)
5.2
5.0
4.8
4.6
0
5
10
15
20
Time (s)

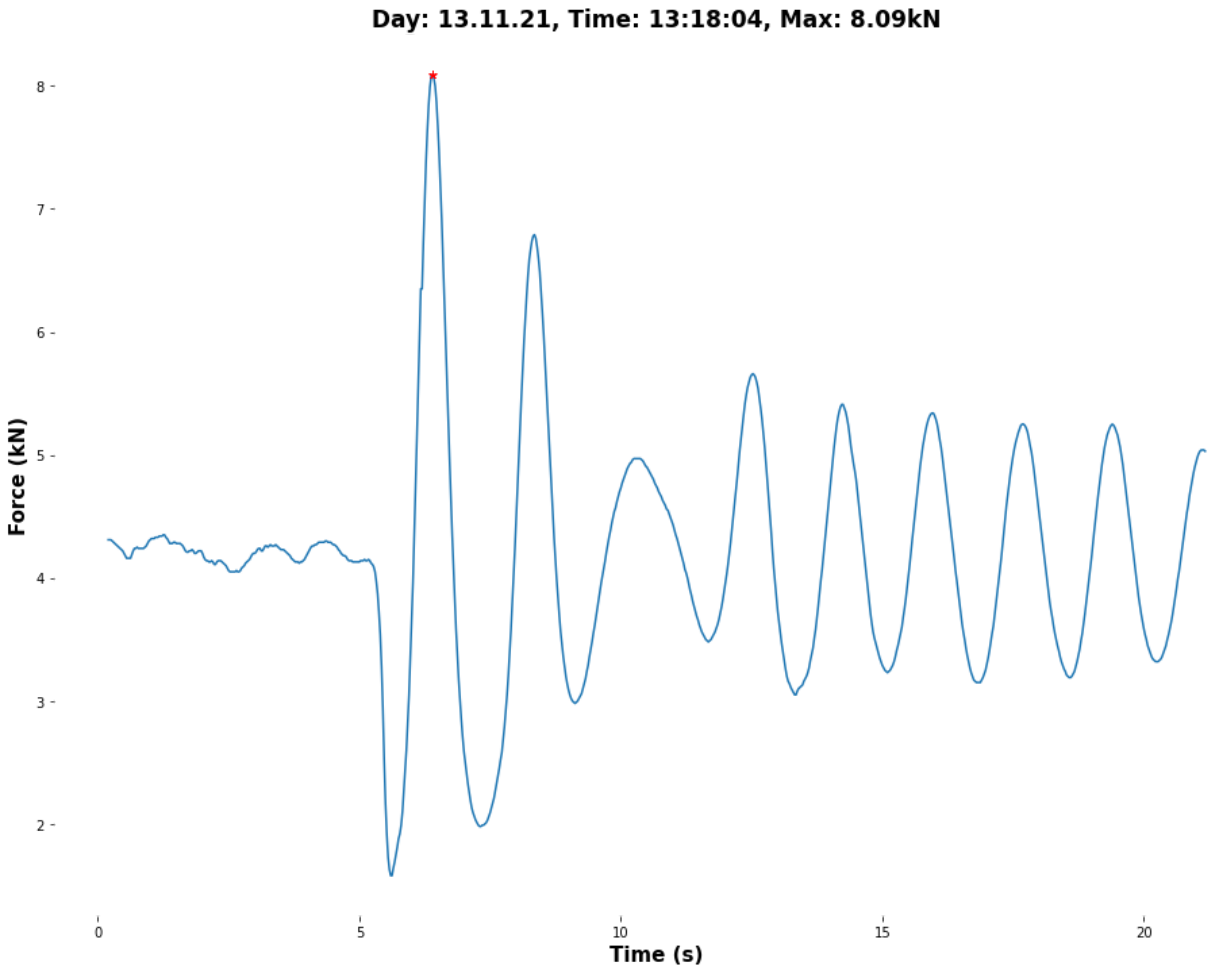

Day: 13.11.21, Time: 12:24:51, Max: 6.02kN
Force (kN)
6.0
5.5
5.0
4.5
4.0
0
5
10
15
20
Time (s)

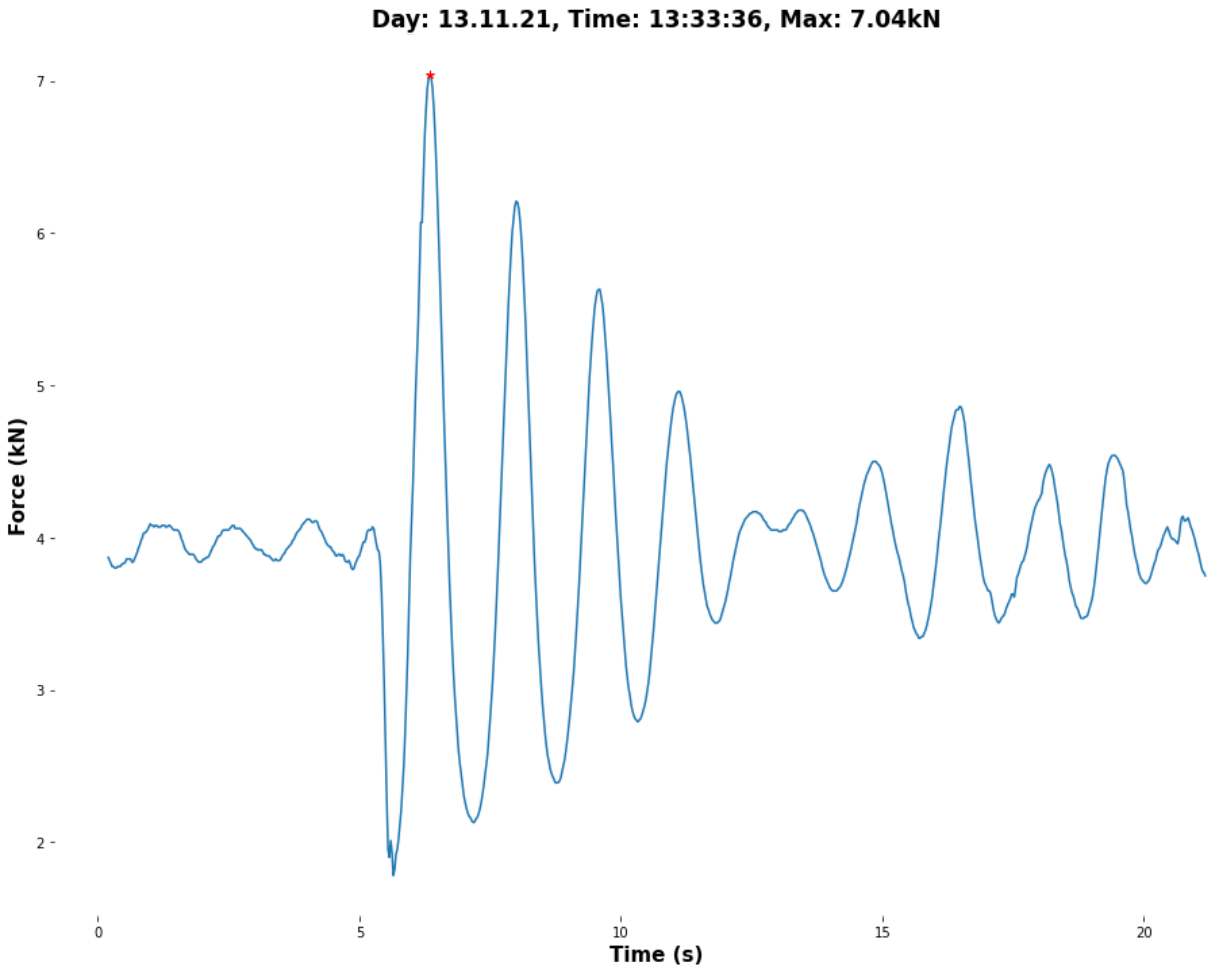

Day: 13.11.21, Time: 12:41:11, Max: 7.9kN
Force (kN)
Time (s)
8
7
6
5
4
3
2
0
5
10
15
20

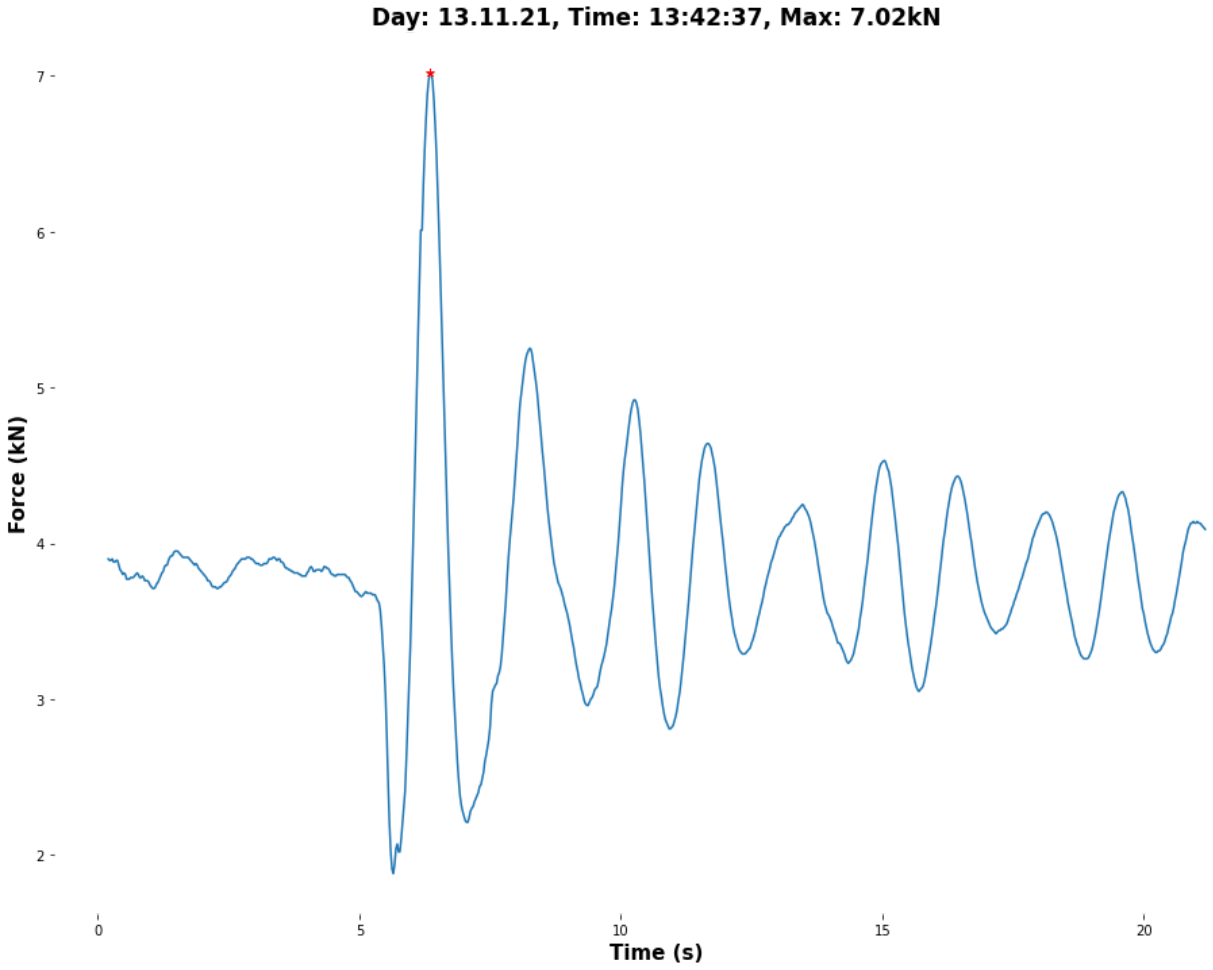

Day: 13.11.21, Time: 12:49:23, Max: 6.31kN
Force (kN)
6.0
5.5
5.0
4.5
4.0
3.5
0
5
10
15
20
Time (s)

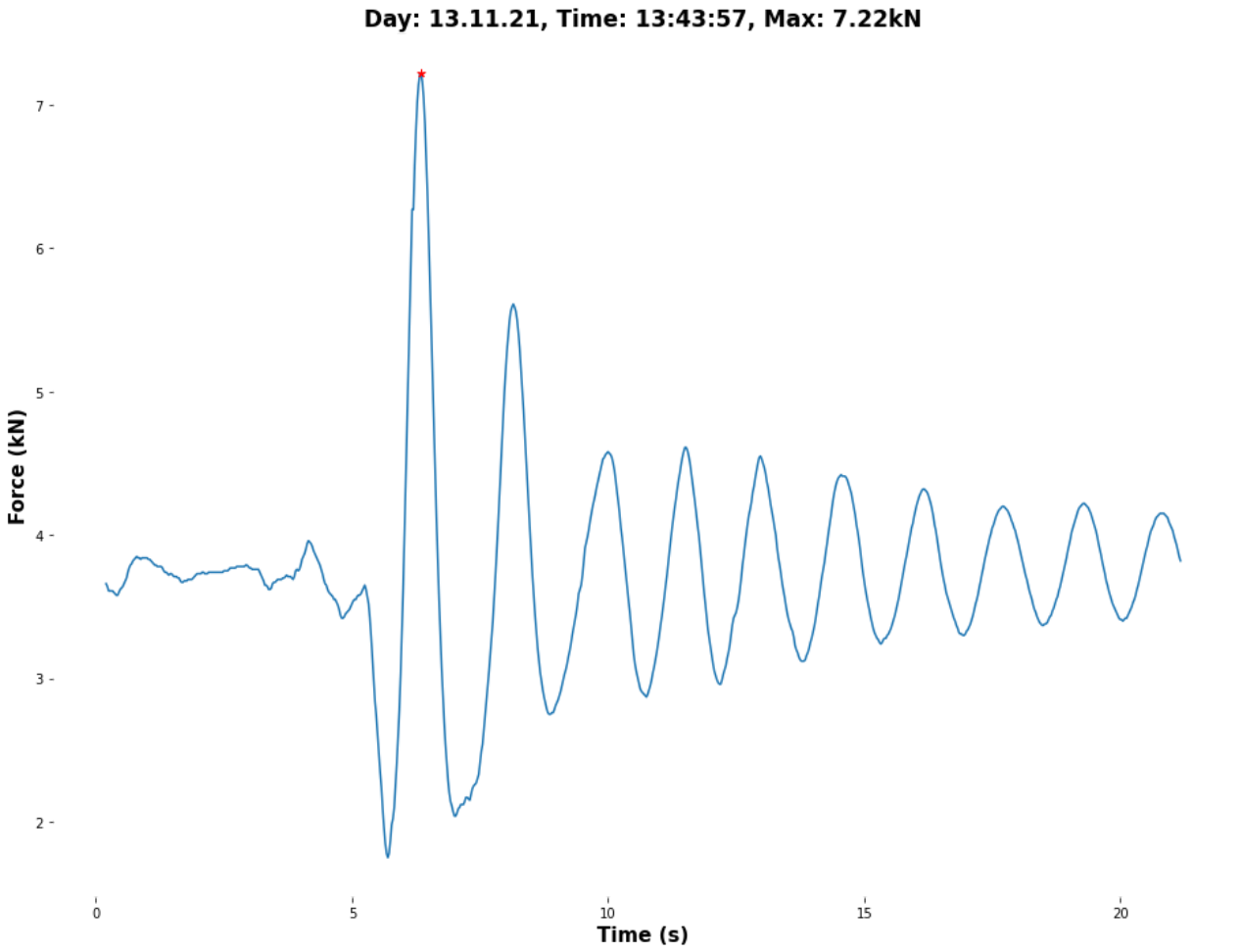

Day: 13.11.21, Time: 12:55:14, Max: 8.14kN
Force (kN)
Time (s)
8
7
6
5
4
3
2
0
5
10
15
20

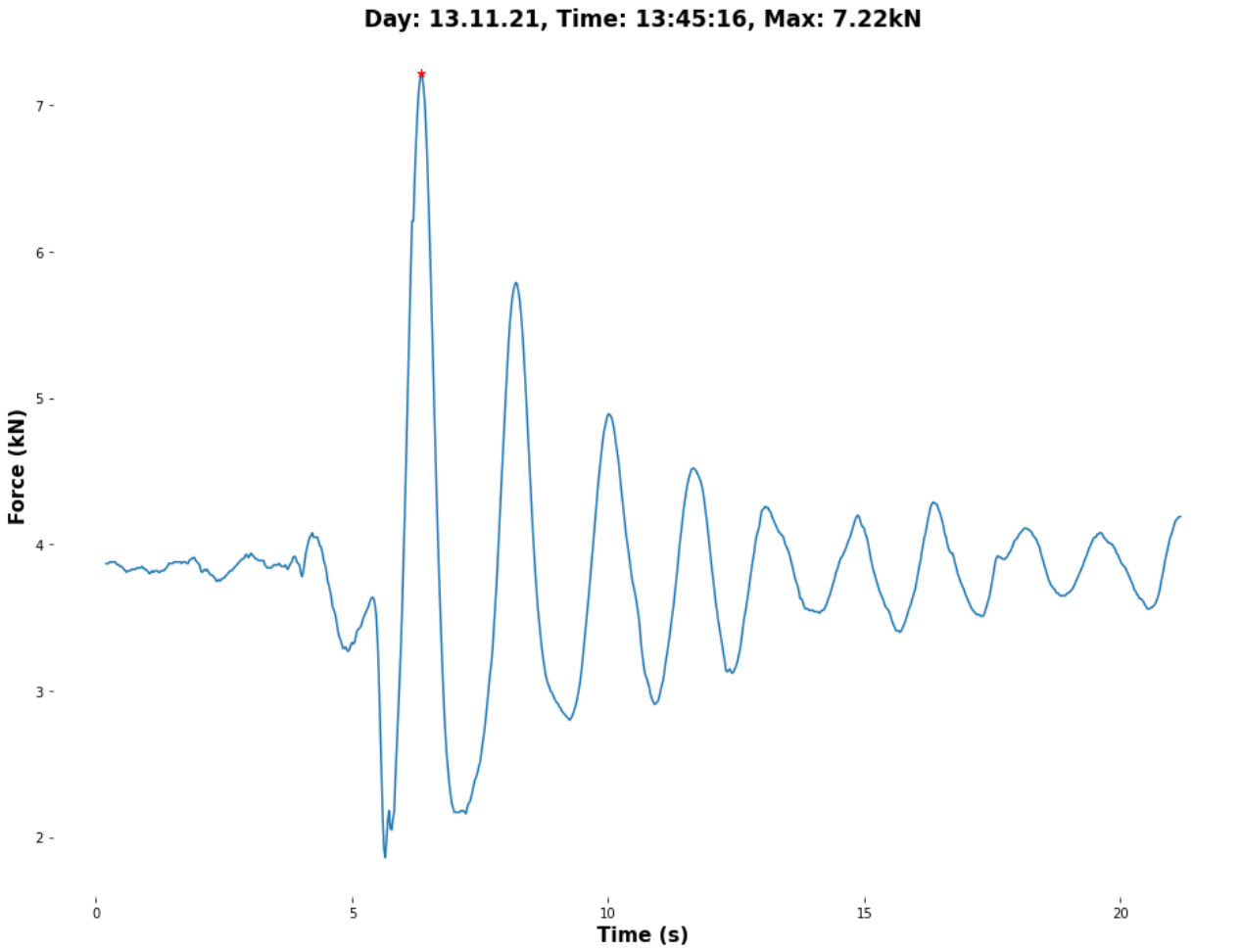

Day: 13.11.21, Time: 12:59:58, Max: 8.23kN
Force (kN)
8
7
6
5
4
3
2
0
5
10
15
20
Time (s)

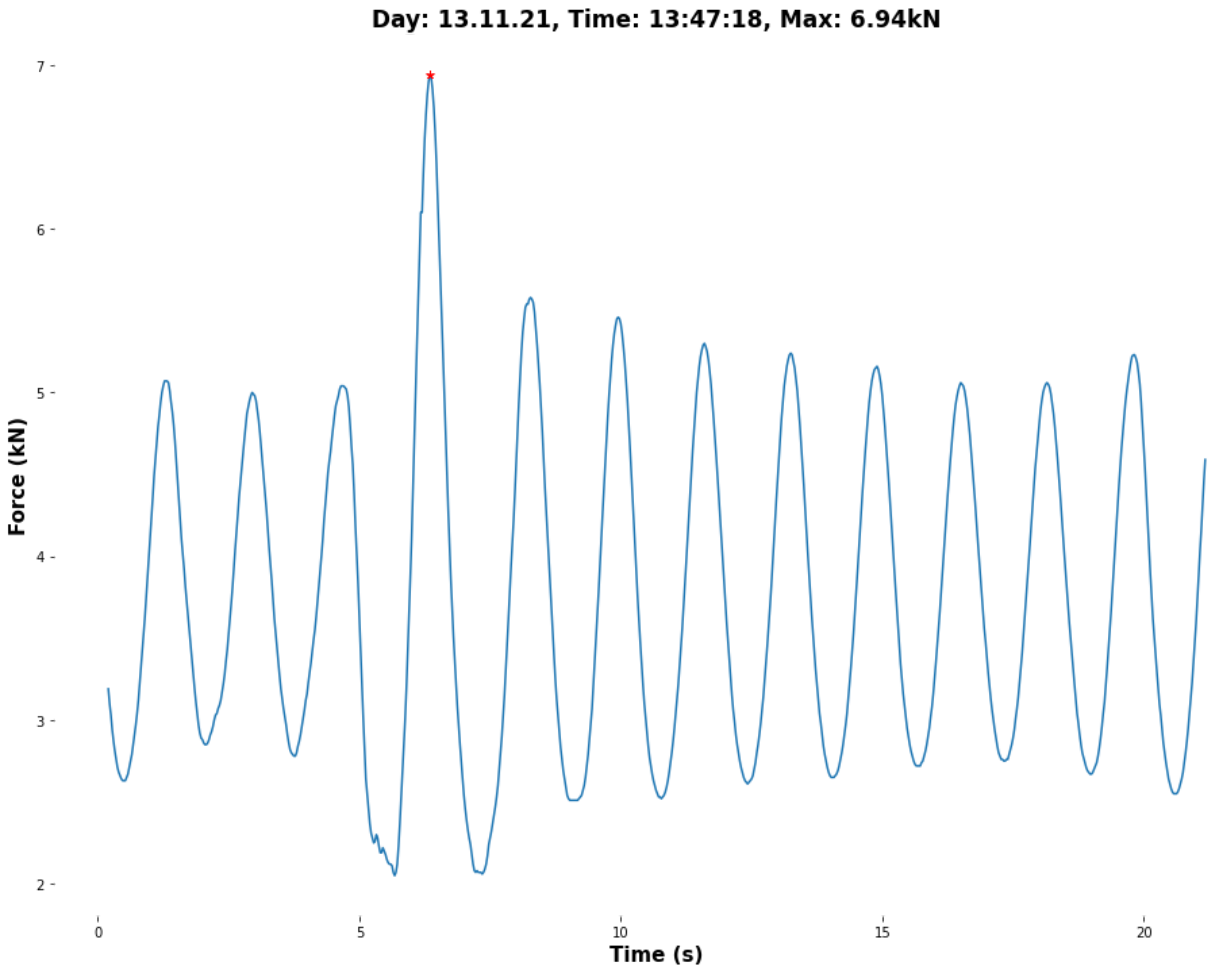

Day: 13.11.21, Time: 13:18:04, Max: 8.09kN
Force (kN)
Time (s)
8
7
6
5
4
3
2
0
5
10
15
20

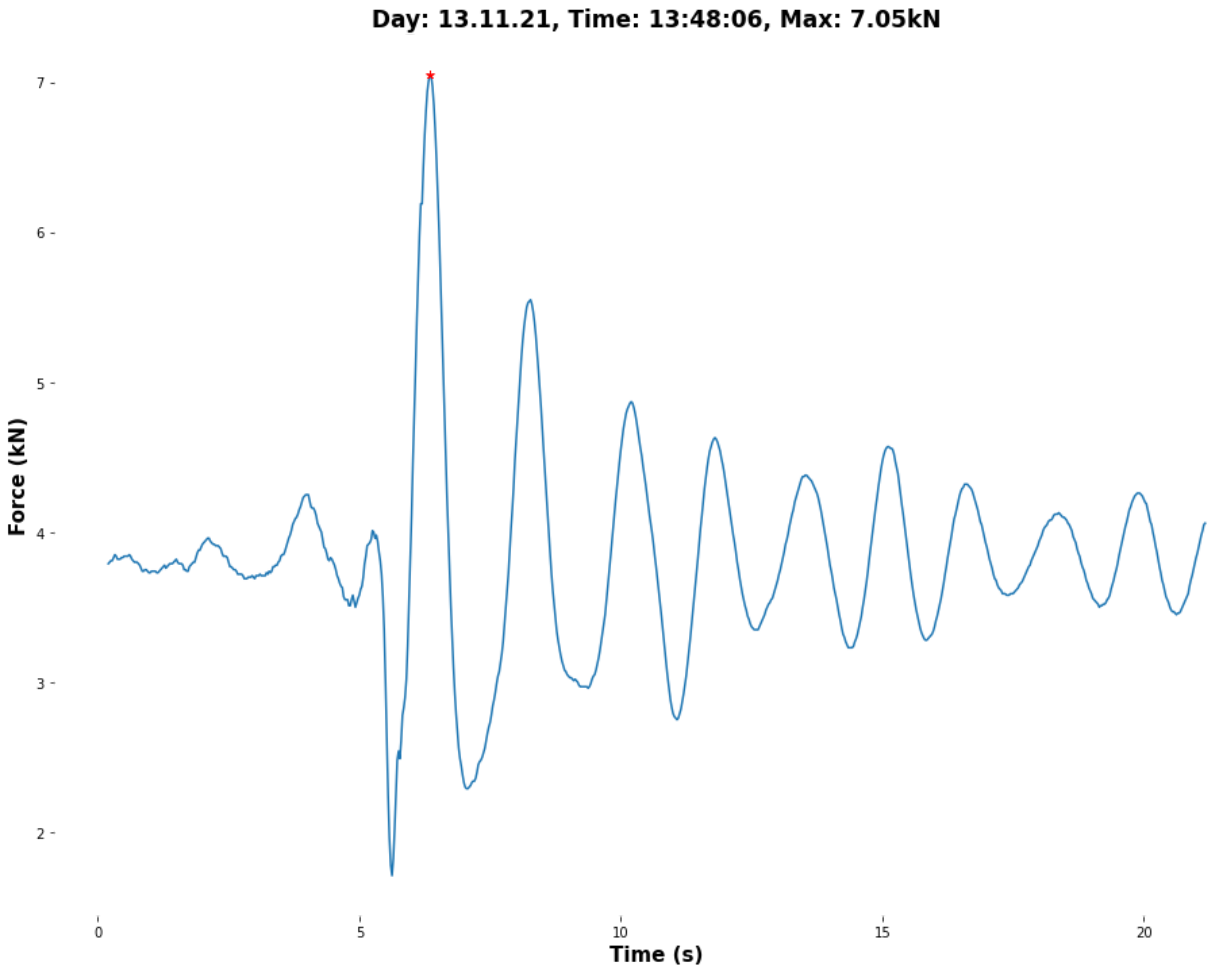

Day: 13.11.21, Time: 13:33:36, Max: 7.04kN
Force (kN)
7
6
5
4
3
2
0
5
10
15
20
Time (s)

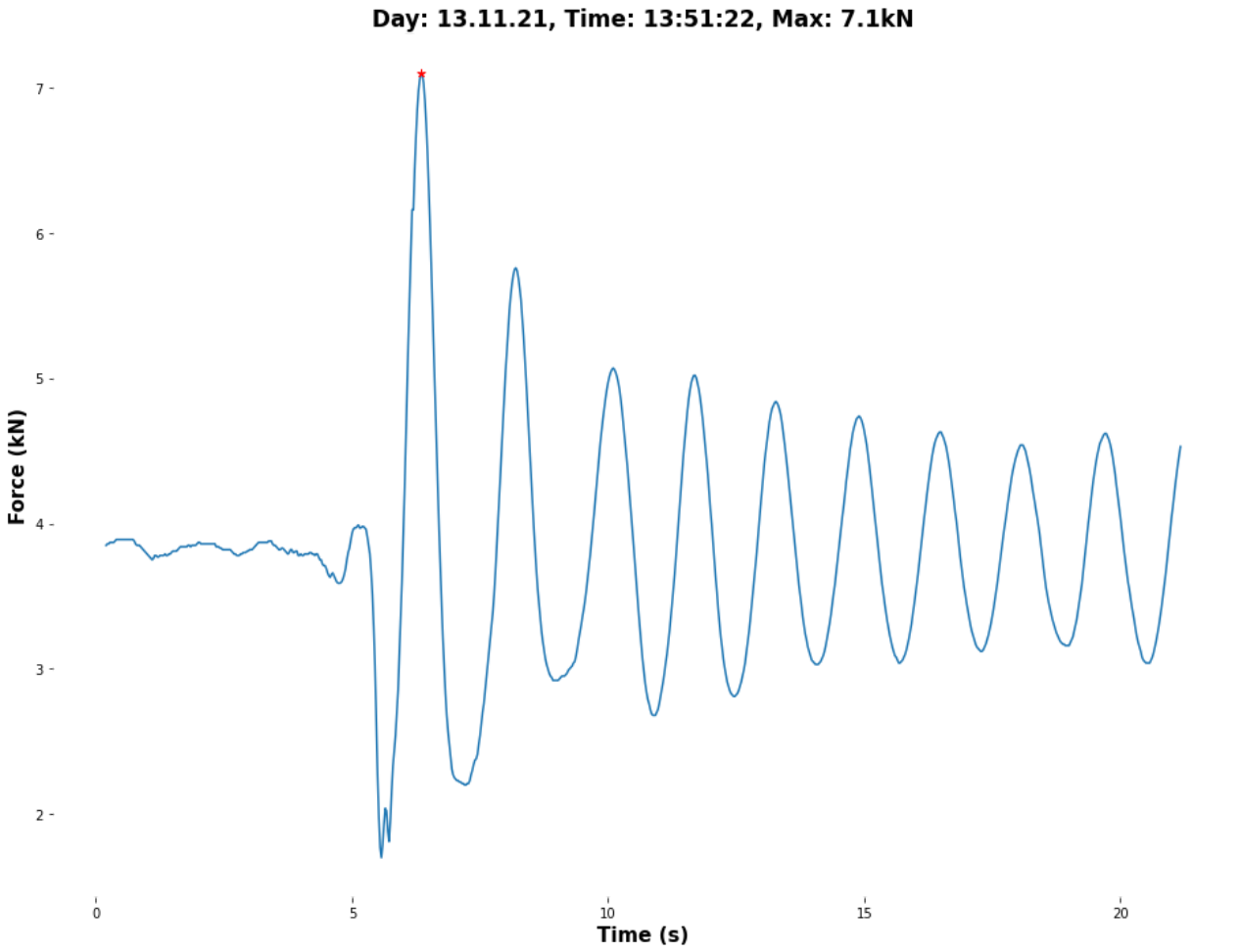

Day: 13.11.21, Time: 13:42:37, Max: 7.02kN
Force (kN)
Time (s)
7
6
5
4
3
2
0
5
10
15
20

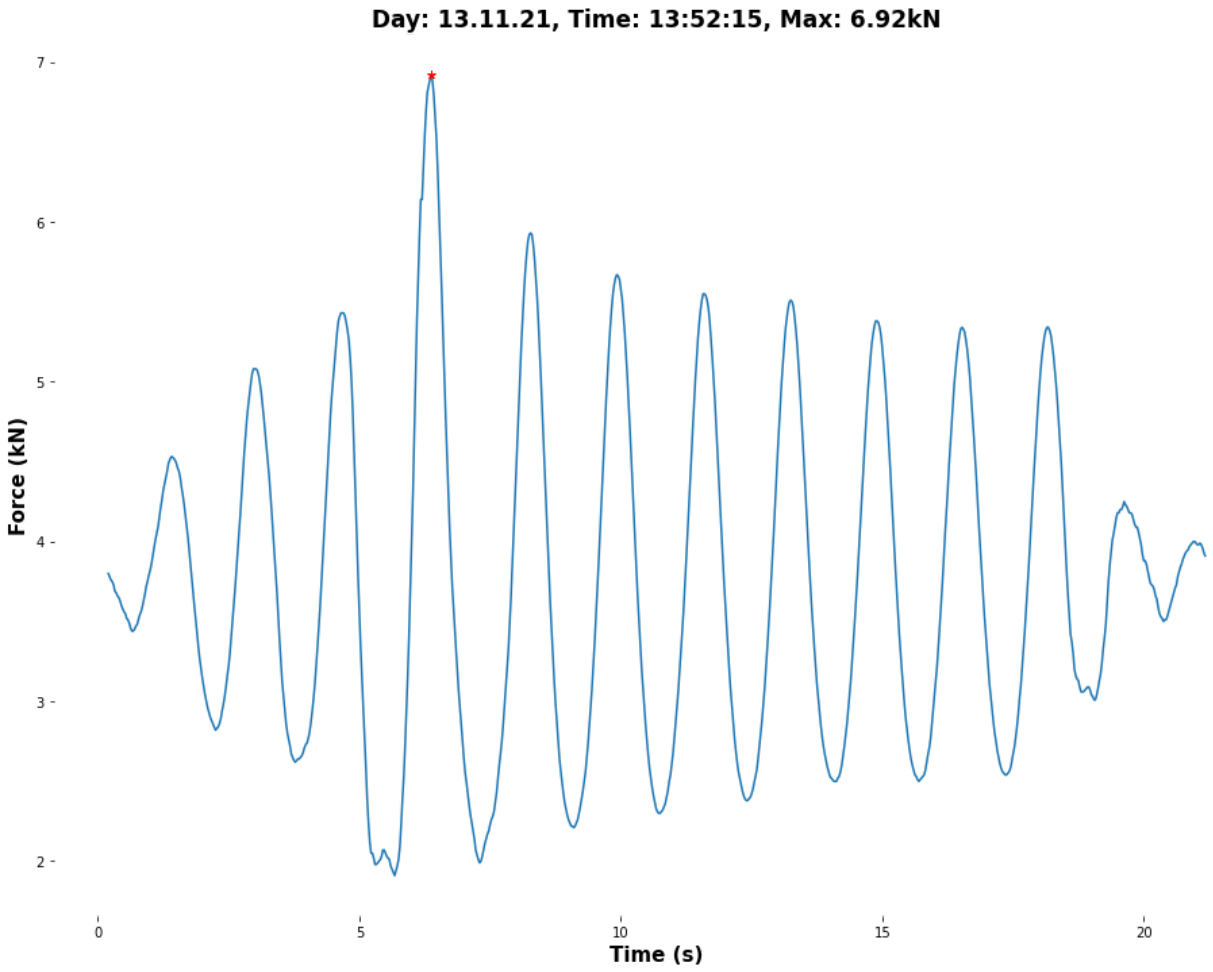

Day: 13.11.21, Time: 13:43:57, Max: 7.22kN
Force (kN)
7
6
5
4
3
2
0
5
10
15
20
Time (s)

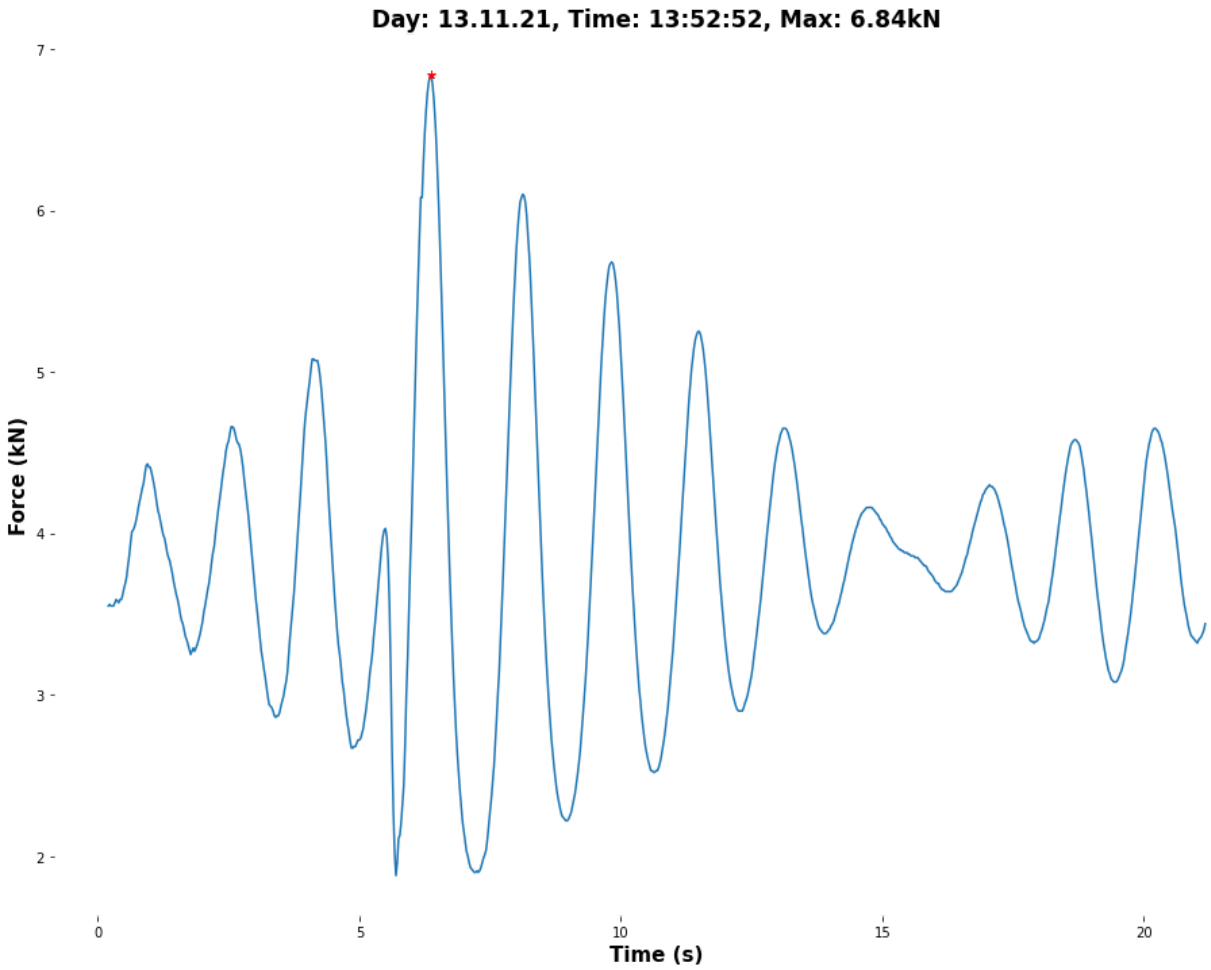

Day: 13.11.21, Time: 13:45:16, Max: 7.22kN
Force (kN)
7
6
5
4
3
2
0
5
10
15
20
Time (s)


Day: 13.11.21, Time: 13:47:18, Max: 6.94kN
Force (kN)
Time (s)
7
6
5
4
3
2
0
5
10
15
20


Day: 13.11.21, Time: 13:48:06, Max: 7.05kN
Force (kN)
Time (s)
7
6
5
4
3
2
0
5
10
15
20


Day: 13.11.21, Time: 13:51:22, Max: 7.1kN
Force (kN)
Time (s)
7
6
5
4
3
2
0
5
10
15
20


Day: 13.11.21, Time: 13:52:15, Max: 6.92kN
Force (kN)
Time (s)
7
6
5
4
3
2
0
5
10
15
20



In [10]:
```
# Write to excel file
with pd.ExcelWriter('Master.xlsx') as writer:
    df10.to_excel(writer, sheet_name = '10Hz Measurements')
    df40.to_excel(writer, sheet_name = '40Hz Measurements')
    df640.to_excel(writer, sheet_name = '640Hz Measurements')
    df1280.to_excel(writer, sheet_name = '1280Hz Measurements')
```