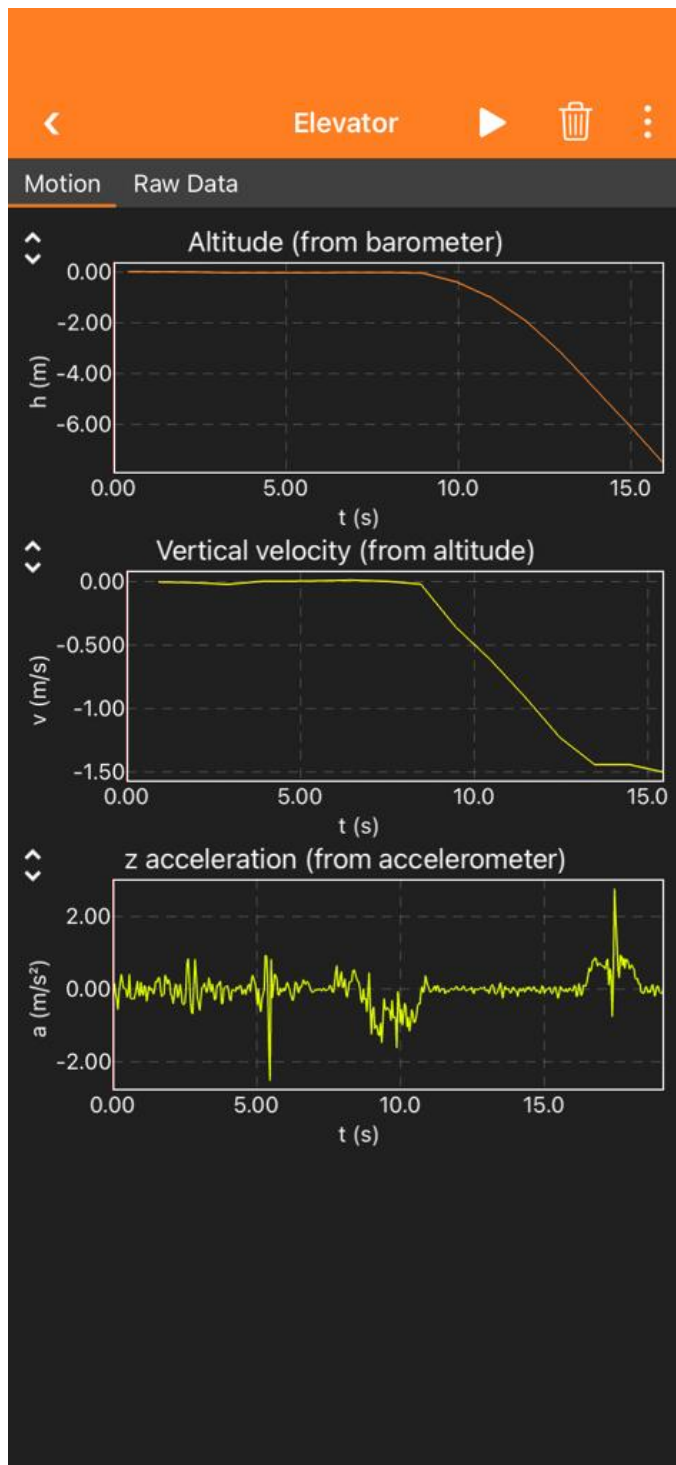# HW 9 experiment 2

For this homework, I have collected the data of accelertion in elevator using the phyphox app on iphone.

Elivator cceleration Experiment (with g)

First, Using the app I am going to take data for the acceleration. I let the app to take the data while the elovator was going down for 3 floors. The data plot in the app looks like this :

I will use pandas to import the data and plot it .

```python
import math
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

df = pd.read_csv('Acceleration.csv')
df
```

```
     Time (s)  Acceleration (m/s²)
0    0.059741             0.148168
1    0.099830            -0.136367
2    0.139919            -0.287438
3    0.180009            -0.580769
4    0.220098            -0.073907
..        ...                  ...
473 19.021955            -0.090867
474 19.062044            -0.116944
475 19.102133            -0.150120
476 19.142222            -0.047123
477 19.182311             0.249958

[478 rows x 2 columns]
```

```python
X = df['Time (s)']
Y = df['Acceleration (m/s²)']

fig, ax = plt.subplots(figsize=(10,7))
ax.plot(X,Y, lw=3)
ax.set_xlabel('time(s)',fontsize=14)
ax.set_ylabel('acceleration ',fontsize=14)
ax.set_title('Acceleration in Elevetor', fontsize=14)
```

```
Text(0.5, 1.0, 'Acceleration in Elevetor')
```

Acceleration in Elevetor
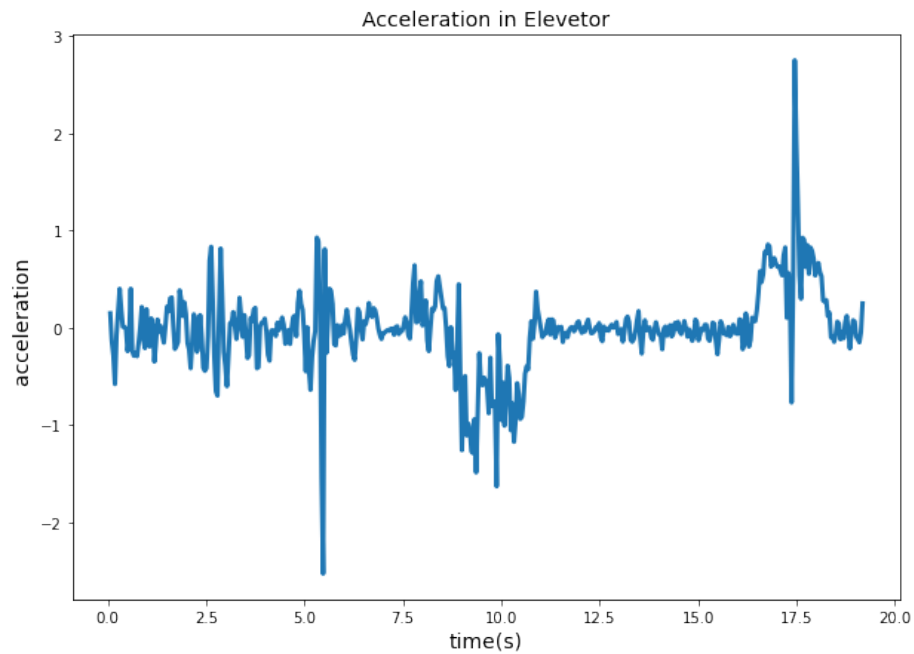
Analysis

I would like to calculate the velocity of the elevator .

The Equation for finding velocity at time t is given by :

$v(t) = v_0 + \int_{t_0}^{t}a(t) dt = \int_{t_0}^{t}a(t) dt $, here $ v_0$ = 0 , our initial velocity

velocity

My code for calculating velocity did not work , I have removed it from here.