assignment03

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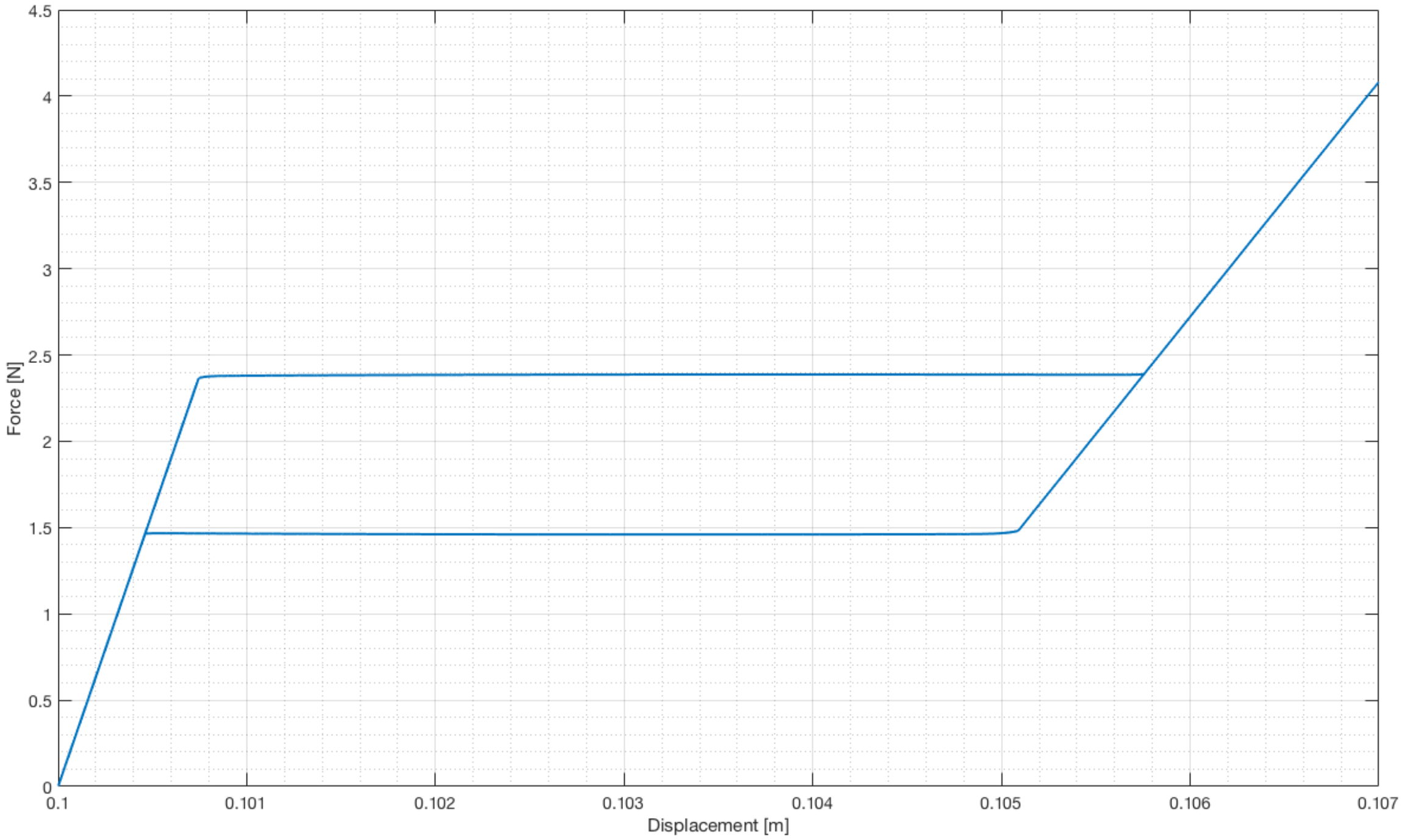
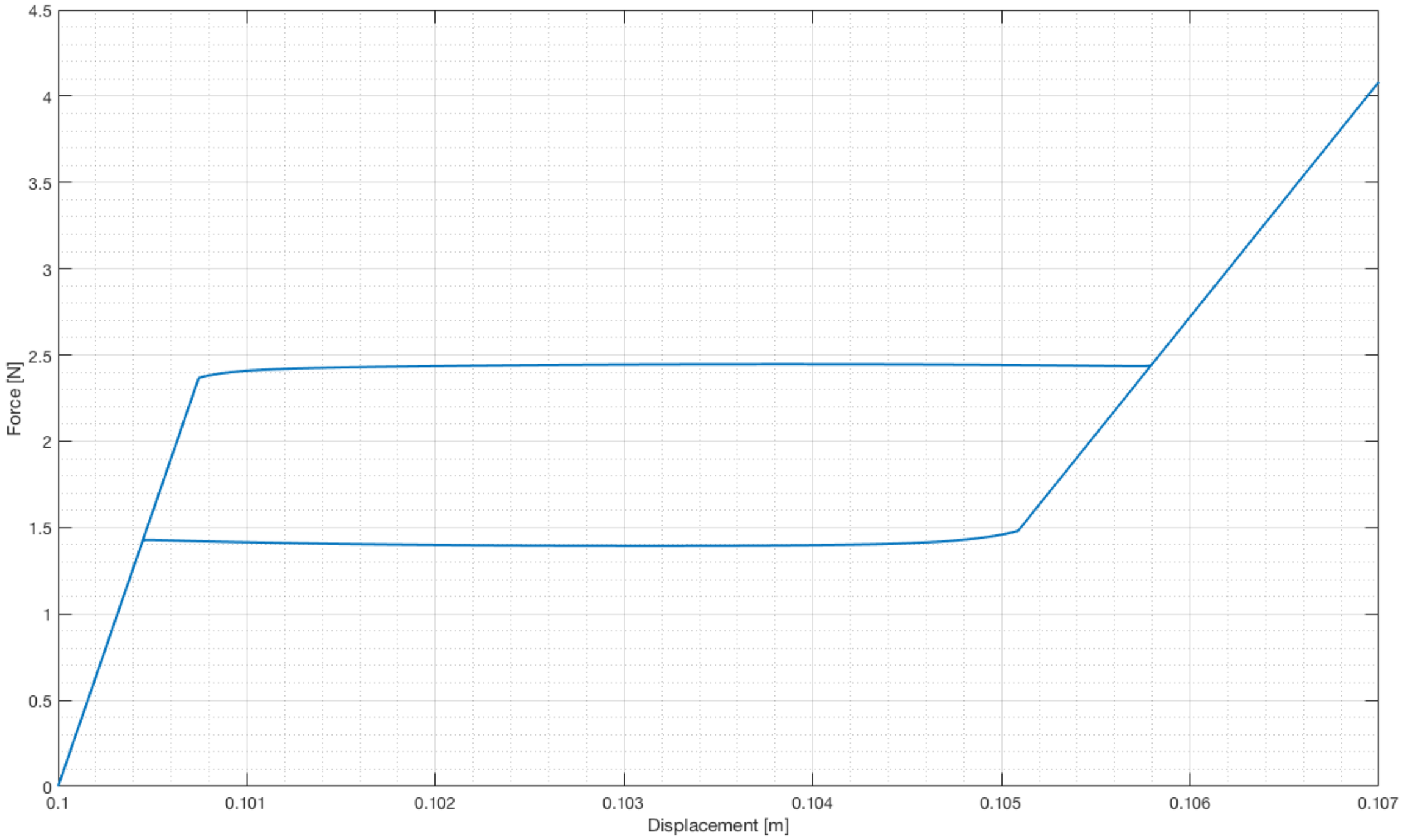
Exercise 1

$f=0.01Hz$



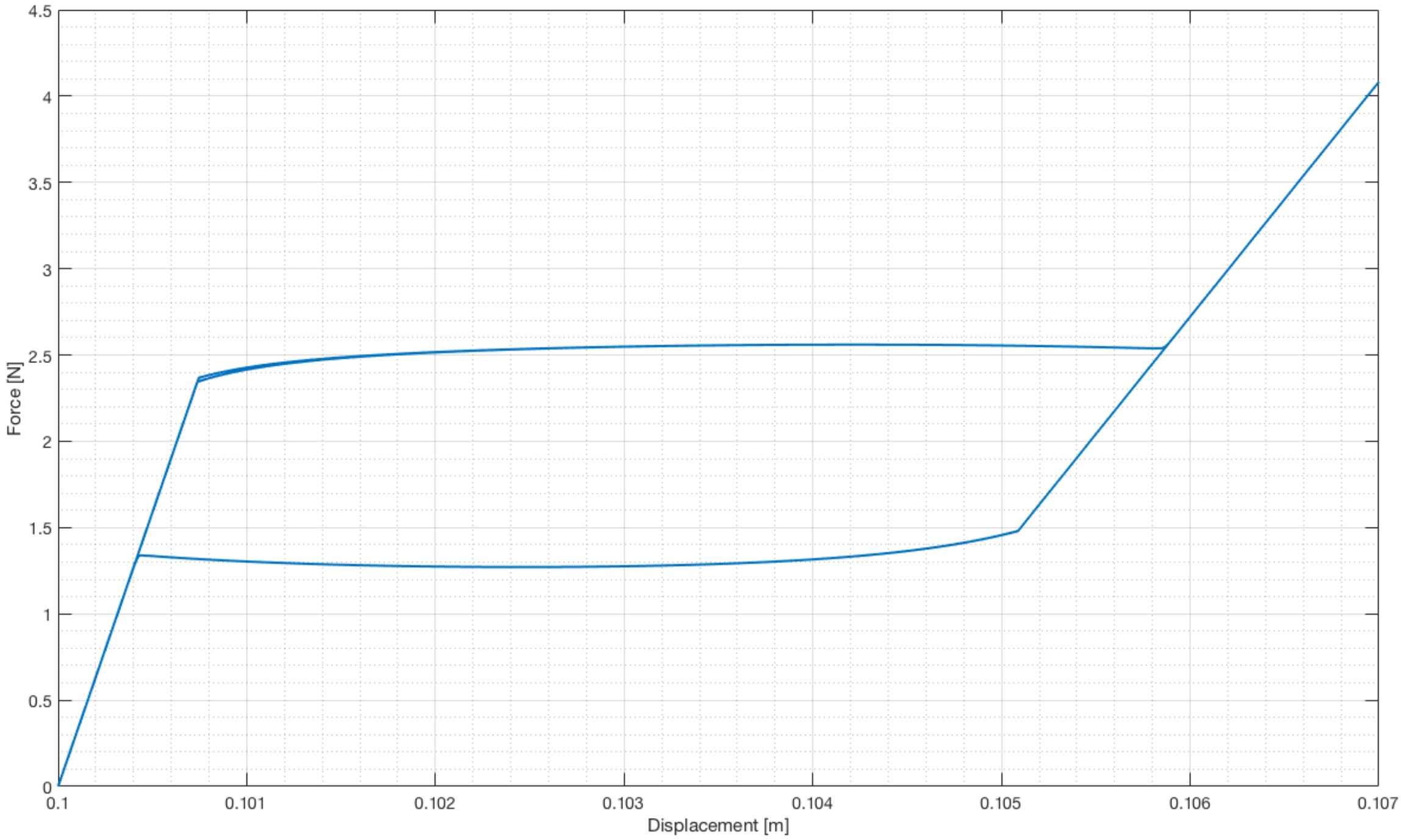
Exercise 1

$f=0.04Hz$



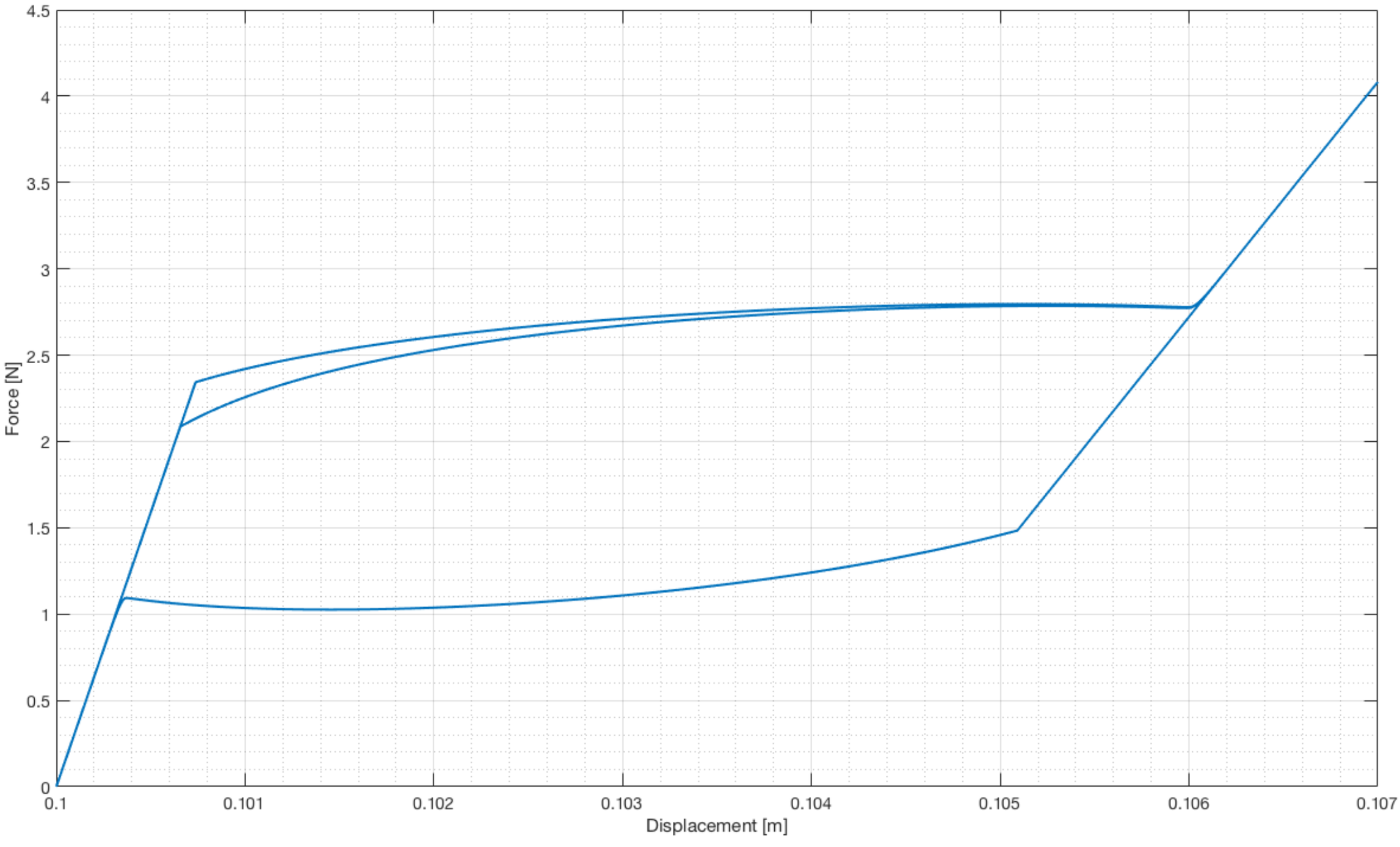
Exercise 1

$f=0.1Hz$



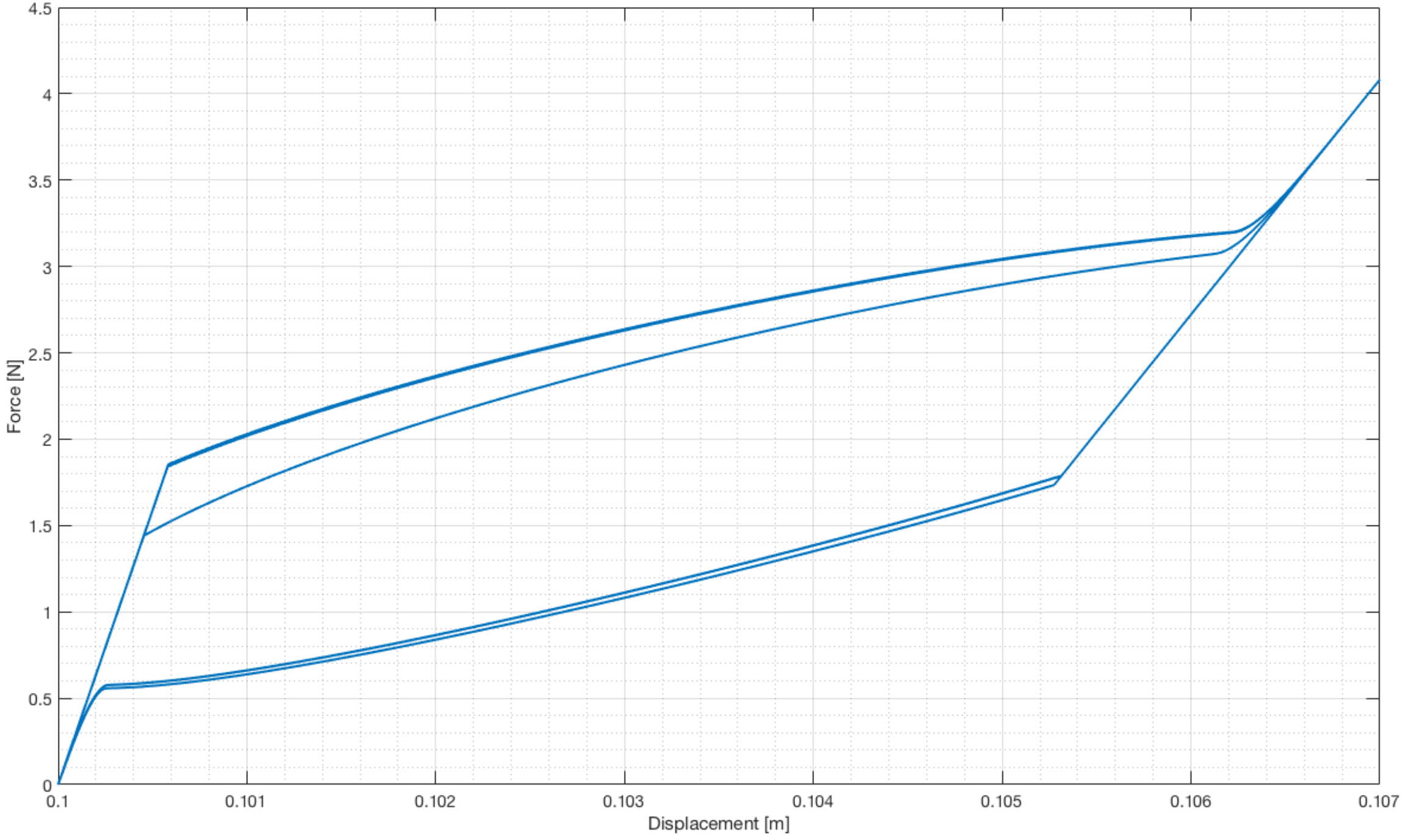
Exercise 1

$f=0.25Hz$



Exercise 1

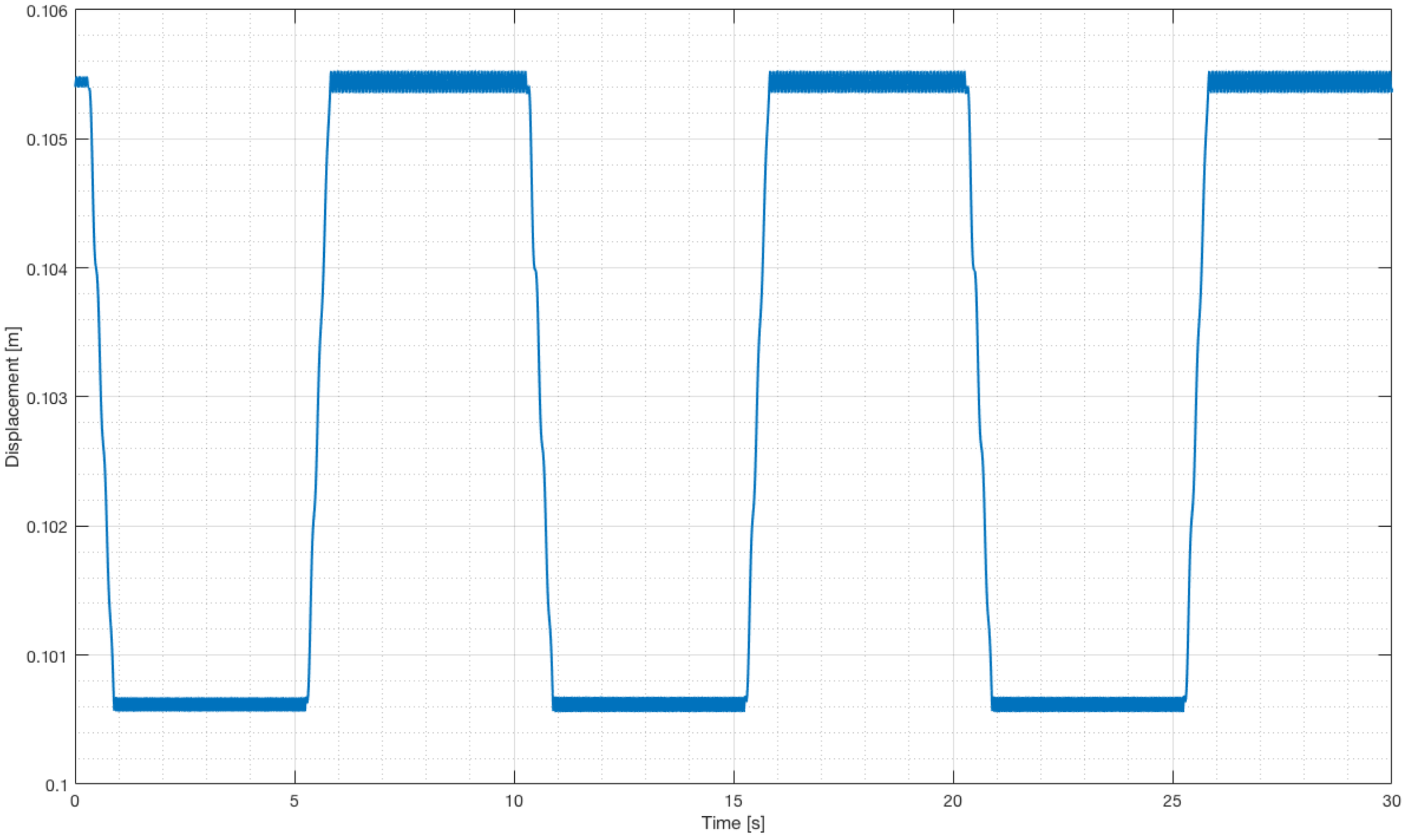
$f=1Hz$



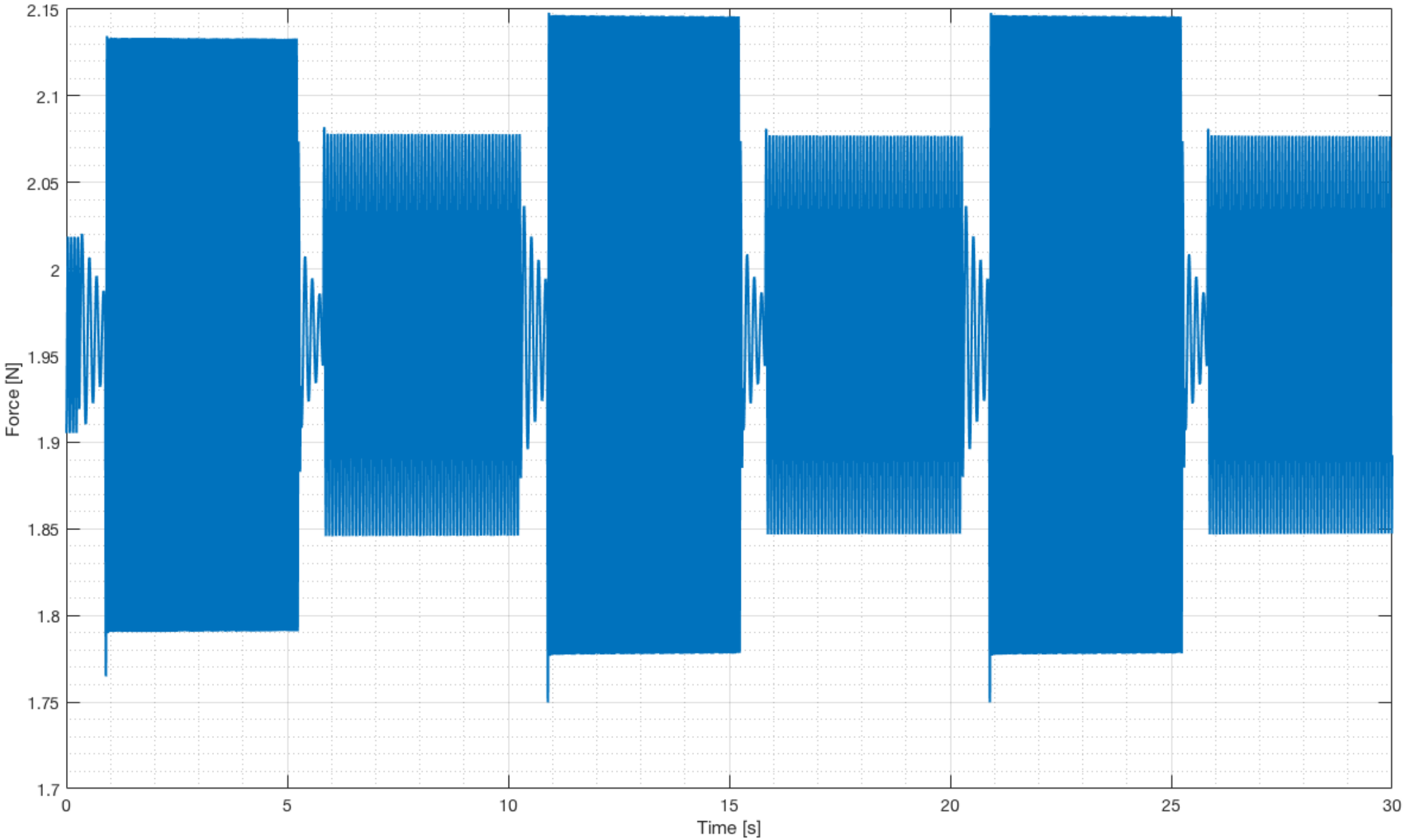
1 Comments

- when the frequency rises, the force displacement curve starts to get smoother
- this is caused by the shortened time for temperature change; therefore the wire gets hotter over time and the phase transformation starts a bit earlier.

2 SMA mass - displacement



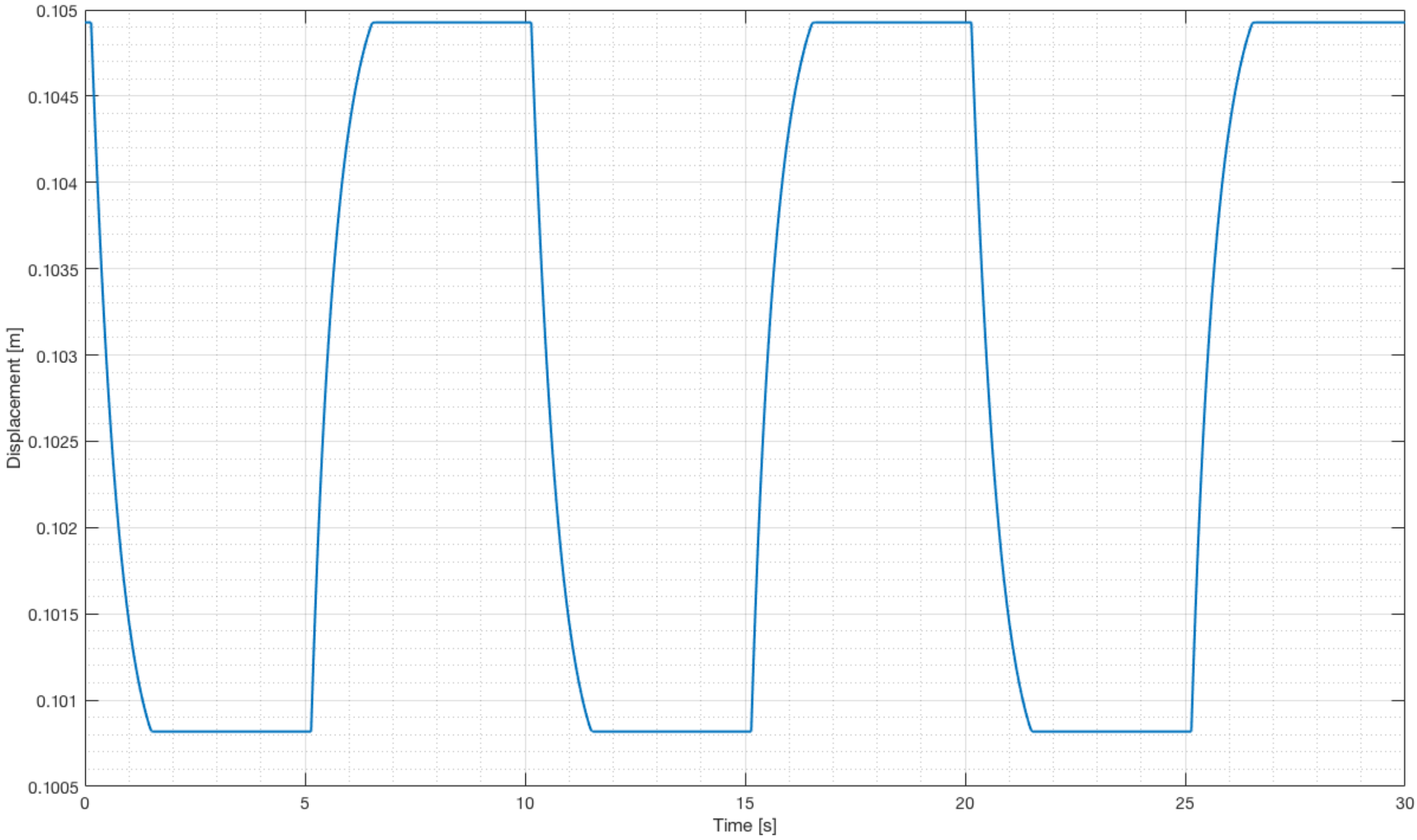
2 SMA mass - force



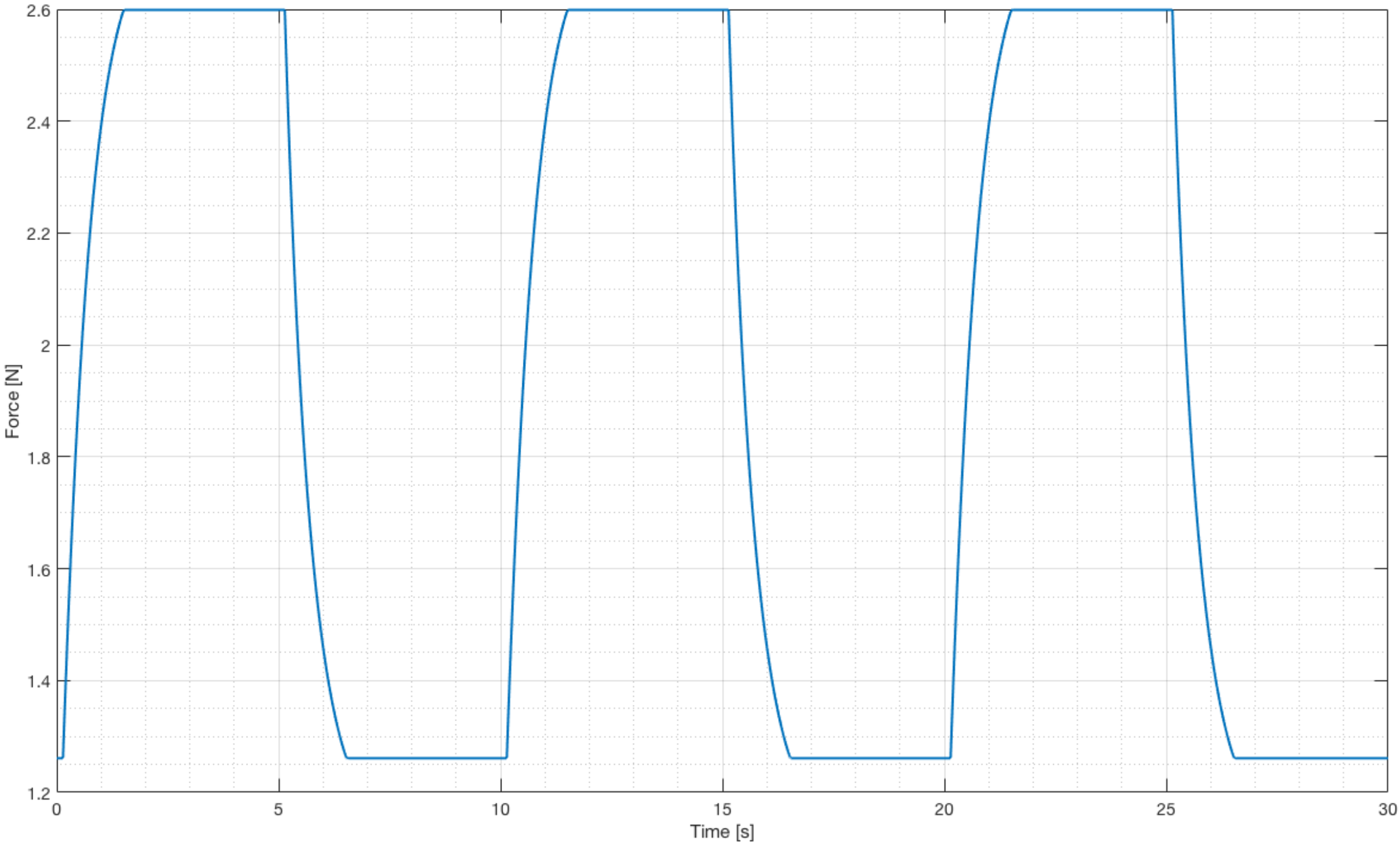
2 Comments

- there is a huge oscillation after each switch caused by the mass
- this is because a mass does not work against oscillations but enables them; at some point the oscillation vanishes because of inertia; in our example the state switches too fast to let the oscillation vanish

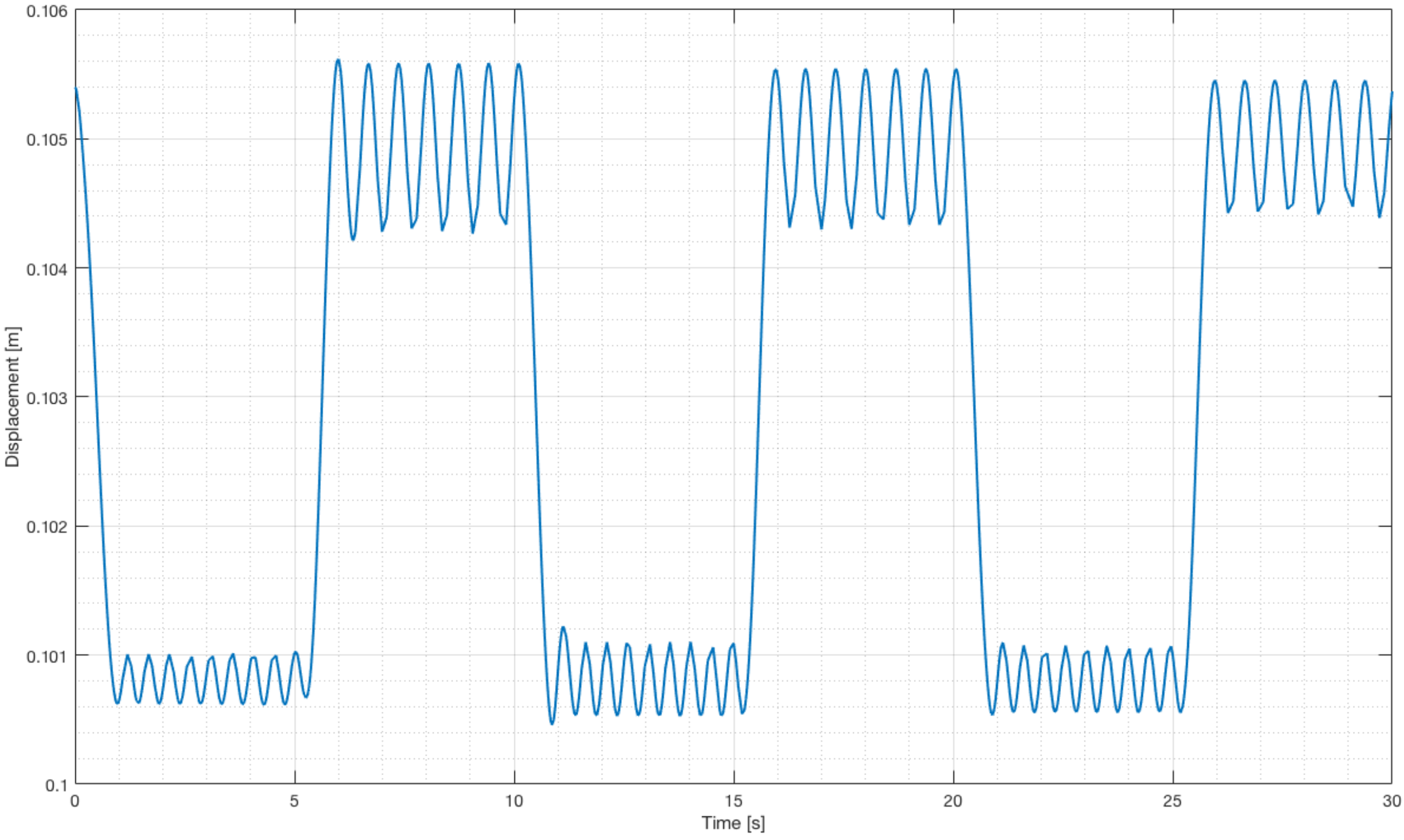
3a SMA spring - displacement



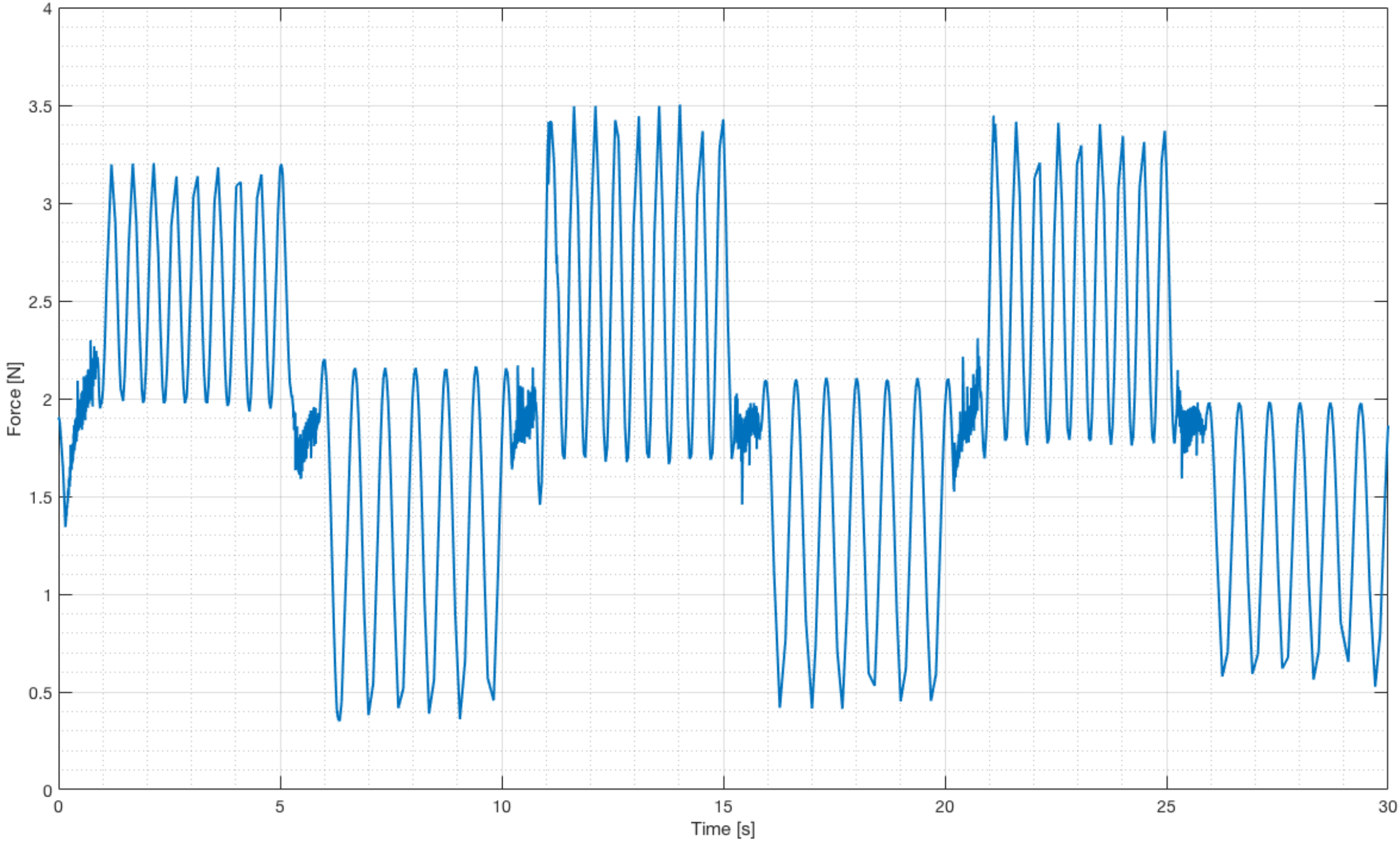
3a SMA spring - force



3b SMA both - displacement



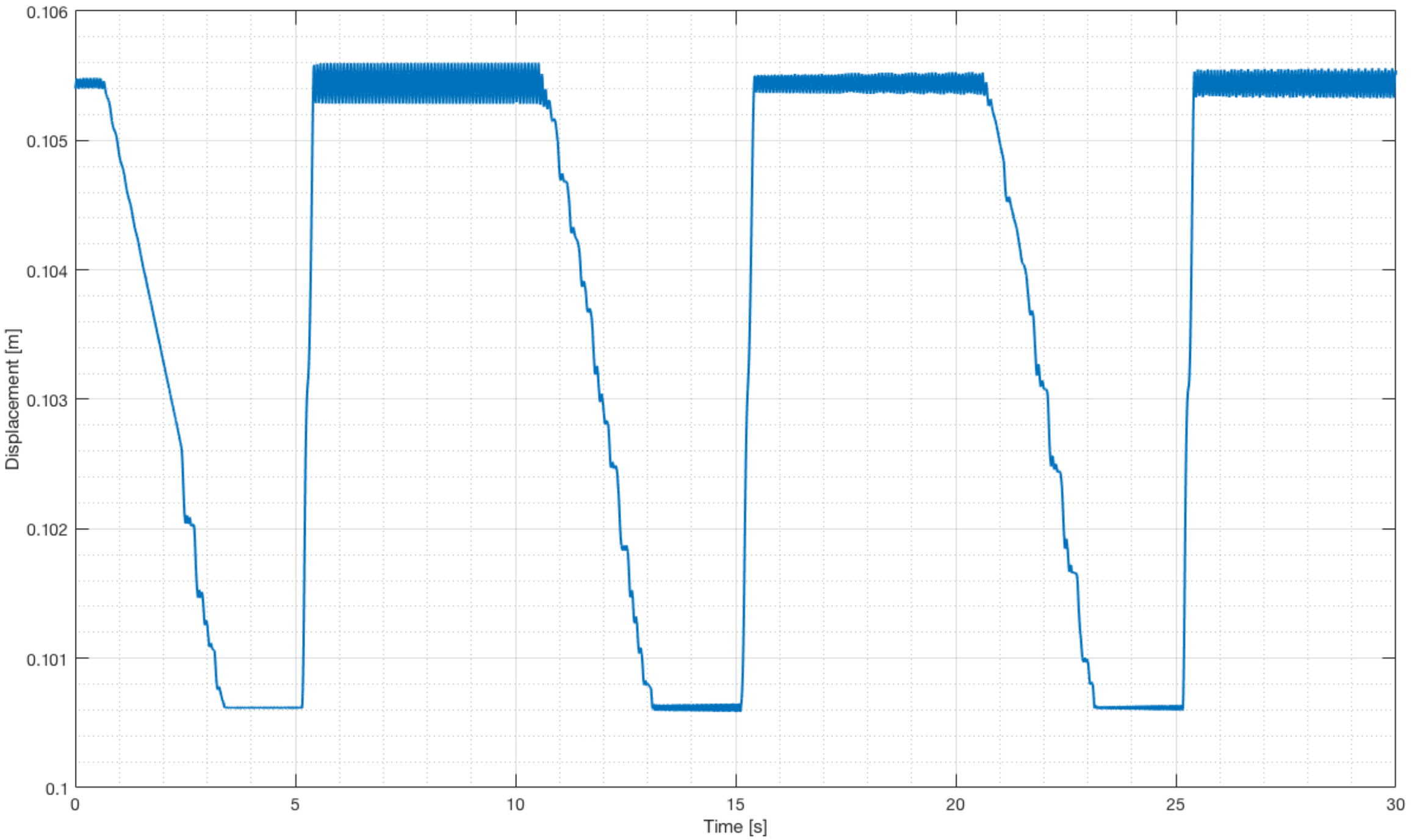
3b SMA both - force



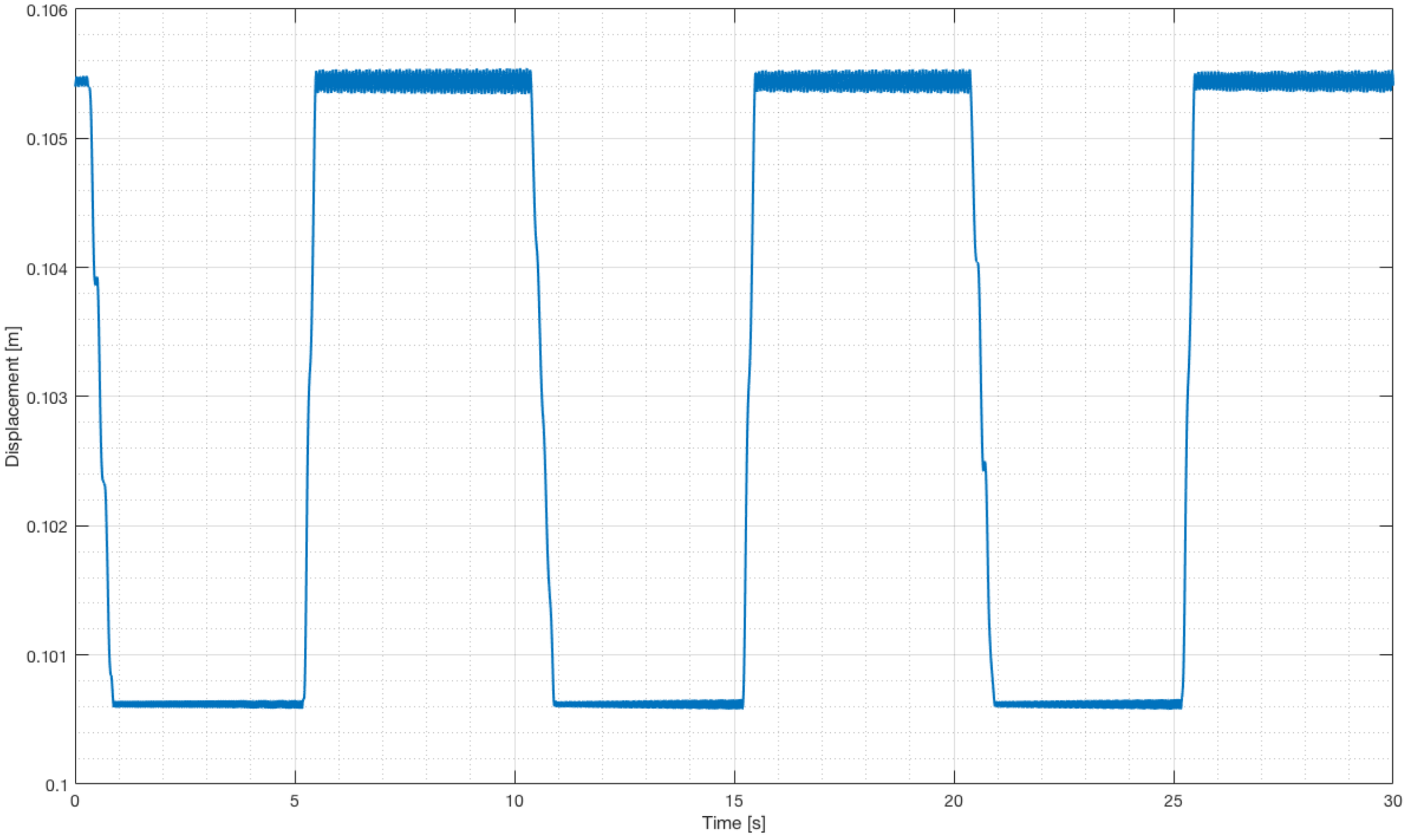
3 Comments

- compared to a mass the spring has a more defined curve (force and displacement) because the spring works against oscillation
- if mass and spring are combined the result represents two oberlayed graphs

4 SMA mass - displacement *(0.4W)*



4 SMA mass - displacement *(0.5W)*



4 Comments

- to improve the behavior we have to increase the amplitude to for example 0.5 to compensate for the reduced environment temperature