

### Ideal Nozzle Simulation Inputs:

a: 35.1535 inch \*\* 2 / pound

n: 0.65

m: -0.2

Initial Oxidiser Volume: 1 liter

External Temp: 85 degF

Grain Diameter: 1.7500 inch

Initial Port Diameter: 1.2 inch

Port Length: 15 inch

Fuel Density: 0.000143 pound / inch \*\* 3

Injector Mass Flow Rate: 0.3307 pound / second

Number of Injectors: 1

Ideal O/F Ratio: 4.83

Time Step: 0.01 second

### Simulation Results:

Total Burn Time: 1.03 second

Impulse: 516.58 newton \* second

Average Thrust: 501.54 newton

Motor Code: I

Motor: I502

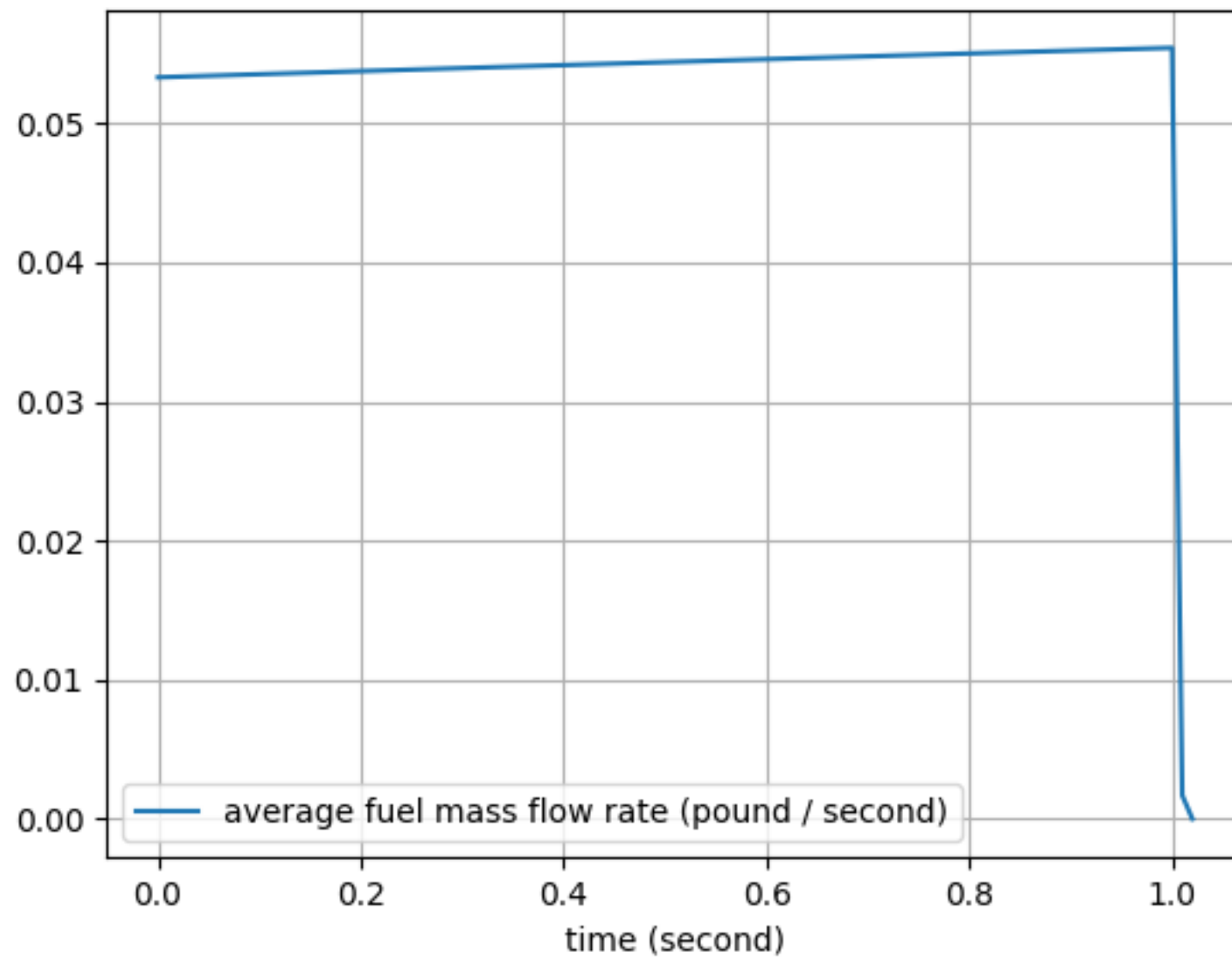
### Nozzle Results:

Suggested Throat Diameter: 0.379 (inch)

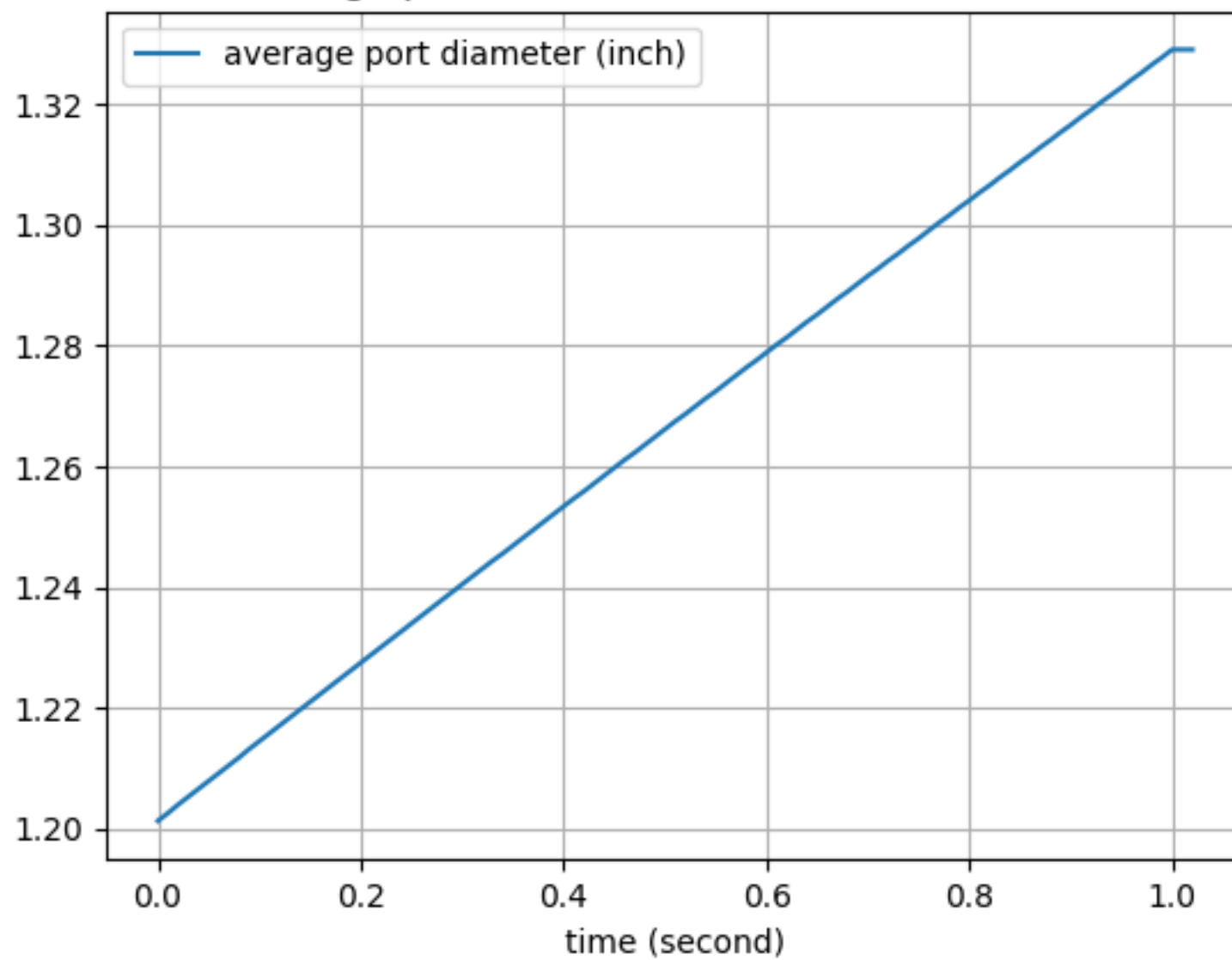
Suggested Exit Diameter: 0.86 (inch)

Suggested Diffuser Length: 0.897 (inch)

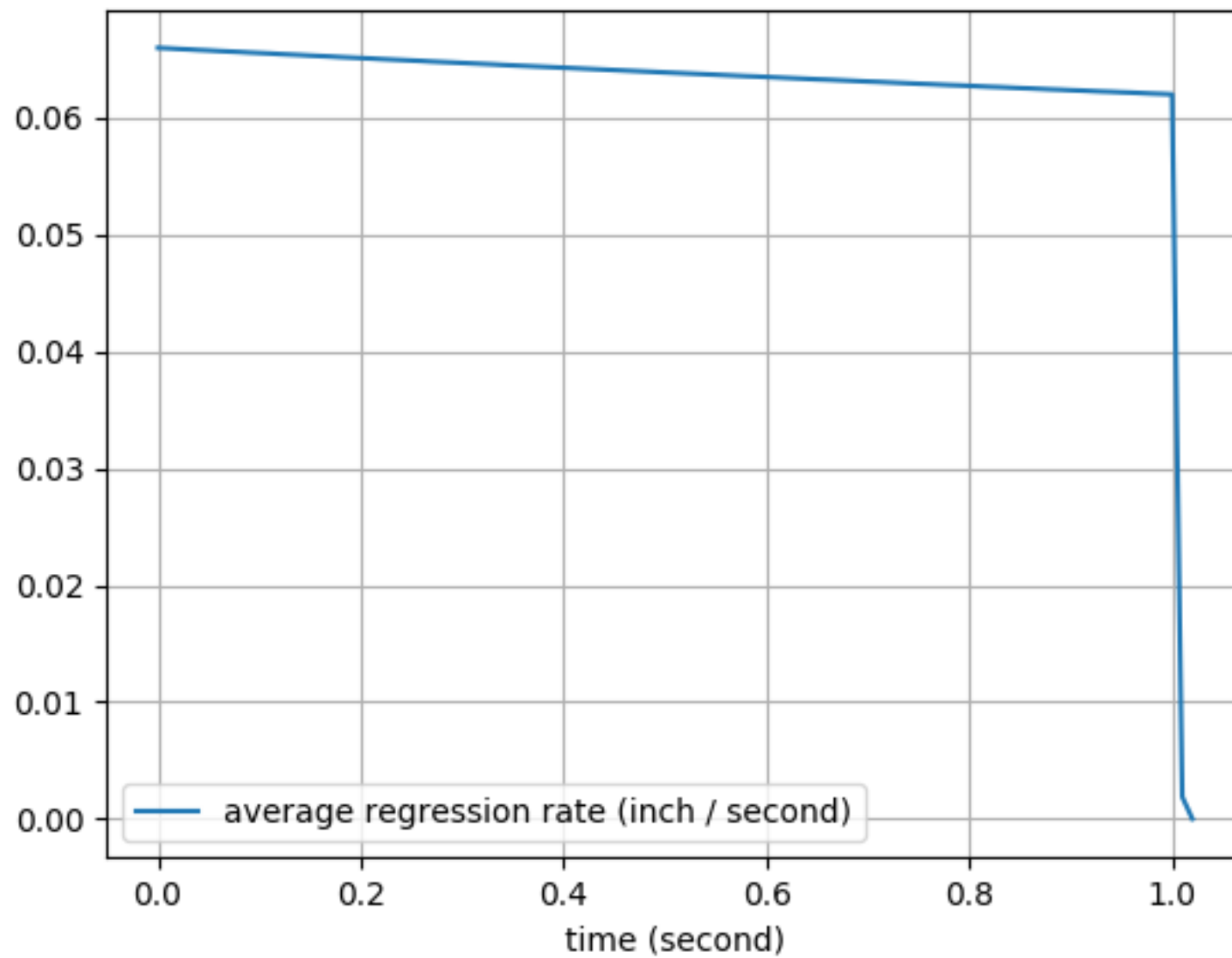
average fuel mass flow rate (pound / second) vs time (second)



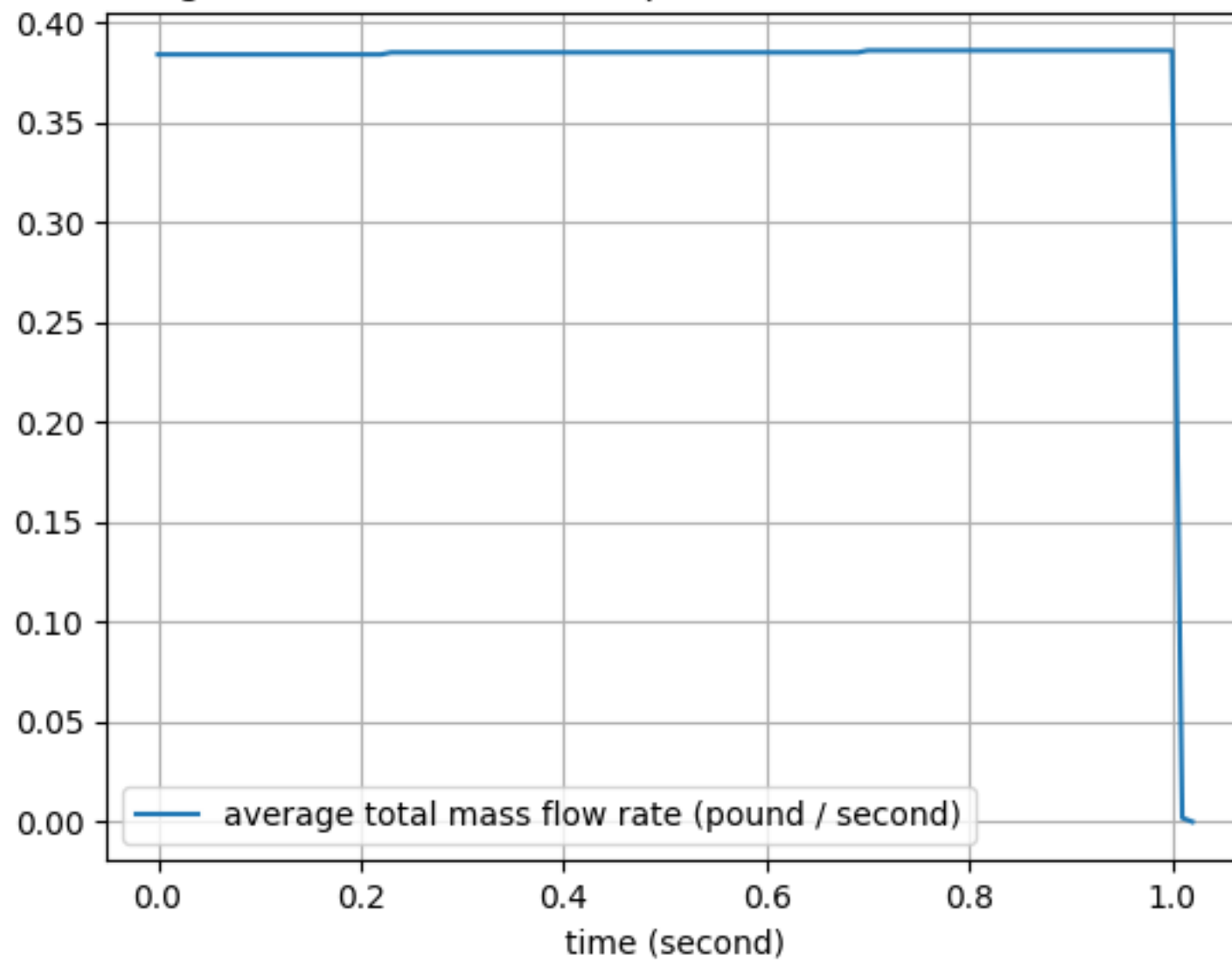
average port diameter (inch) vs time (second)



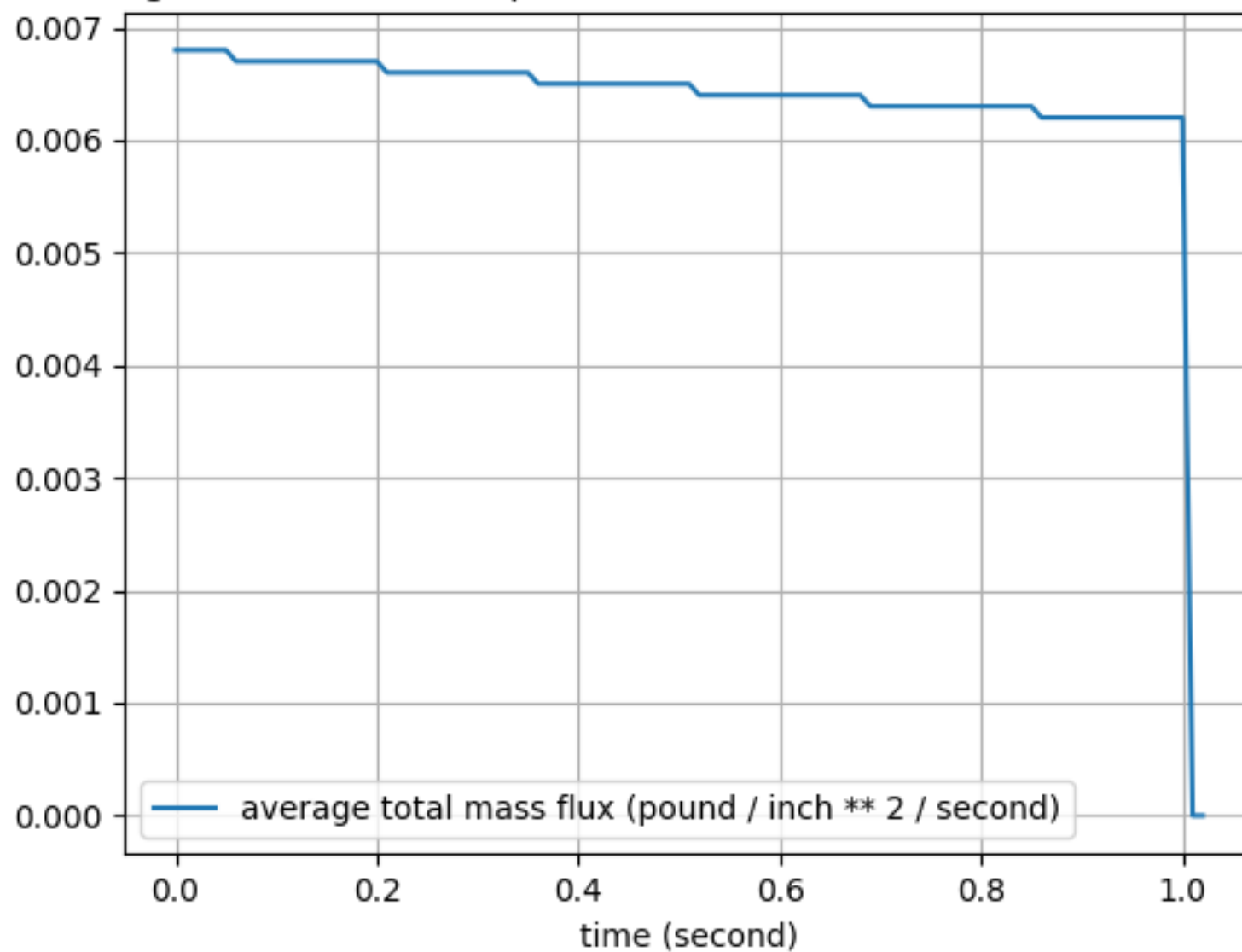
average regression rate (inch / second) vs time (second)



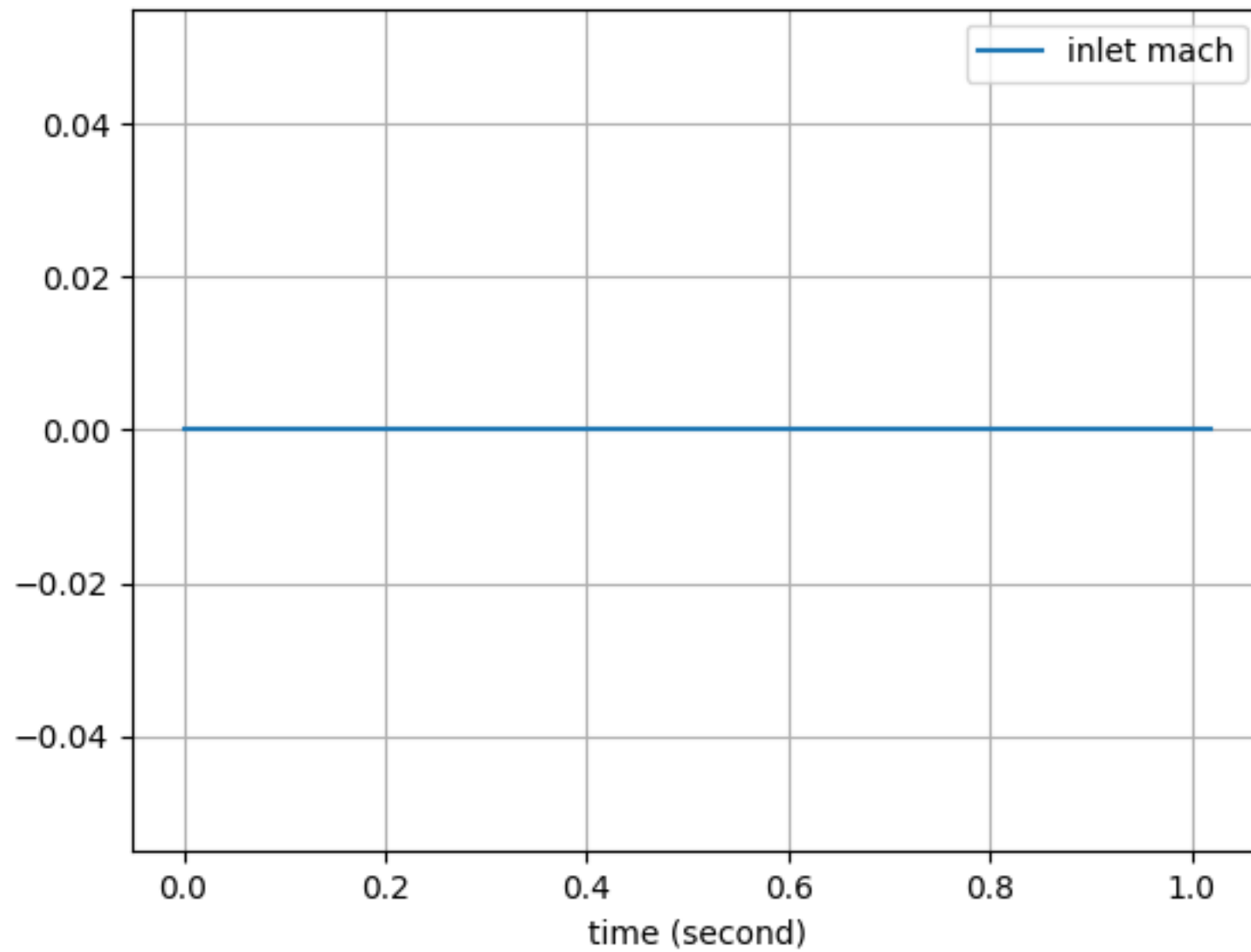
average total mass flow rate (pound / second) vs time (second)



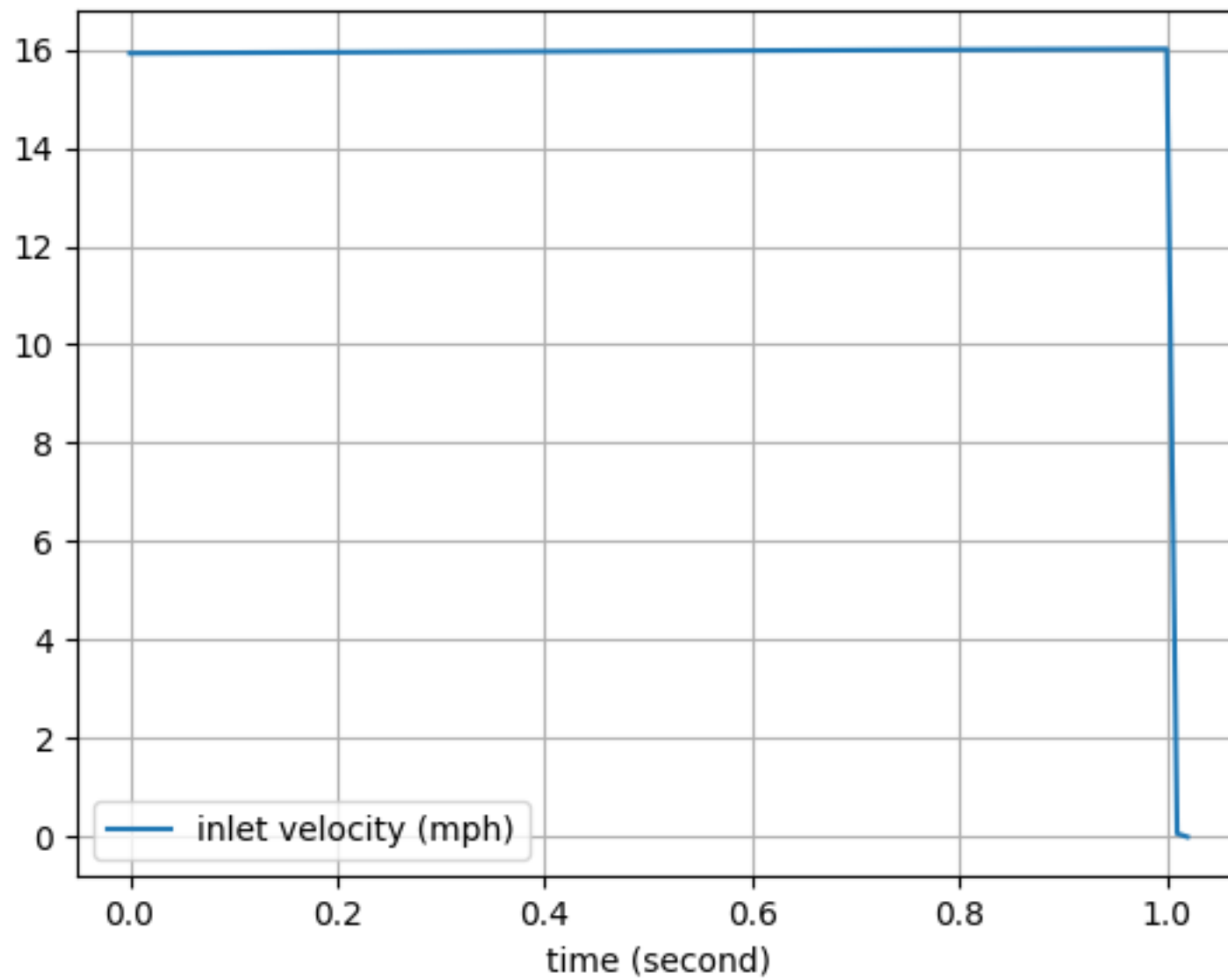
average total mass flux (pound / inch \*\* 2 / second) vs time (second)



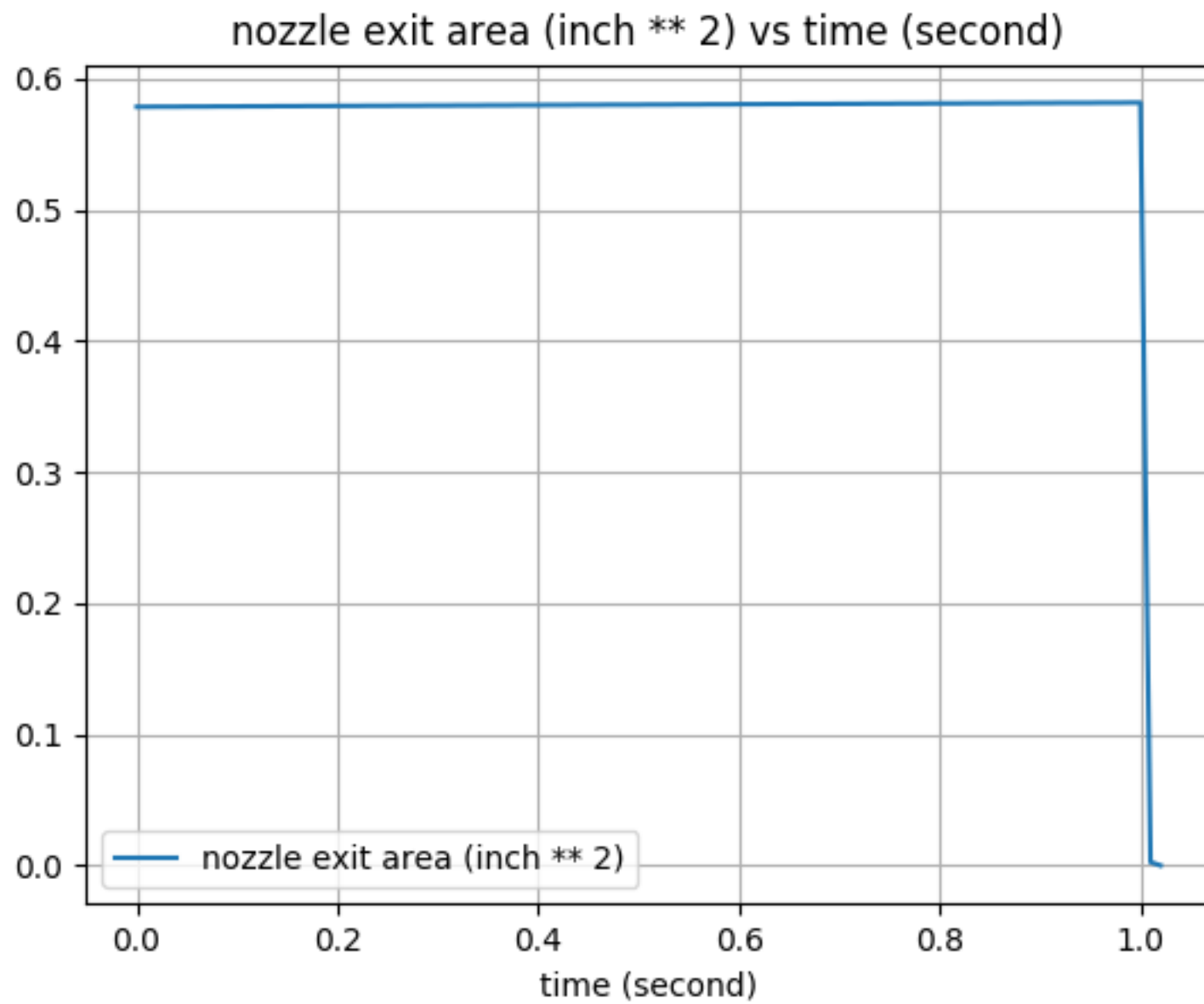
inlet mach vs time (second)



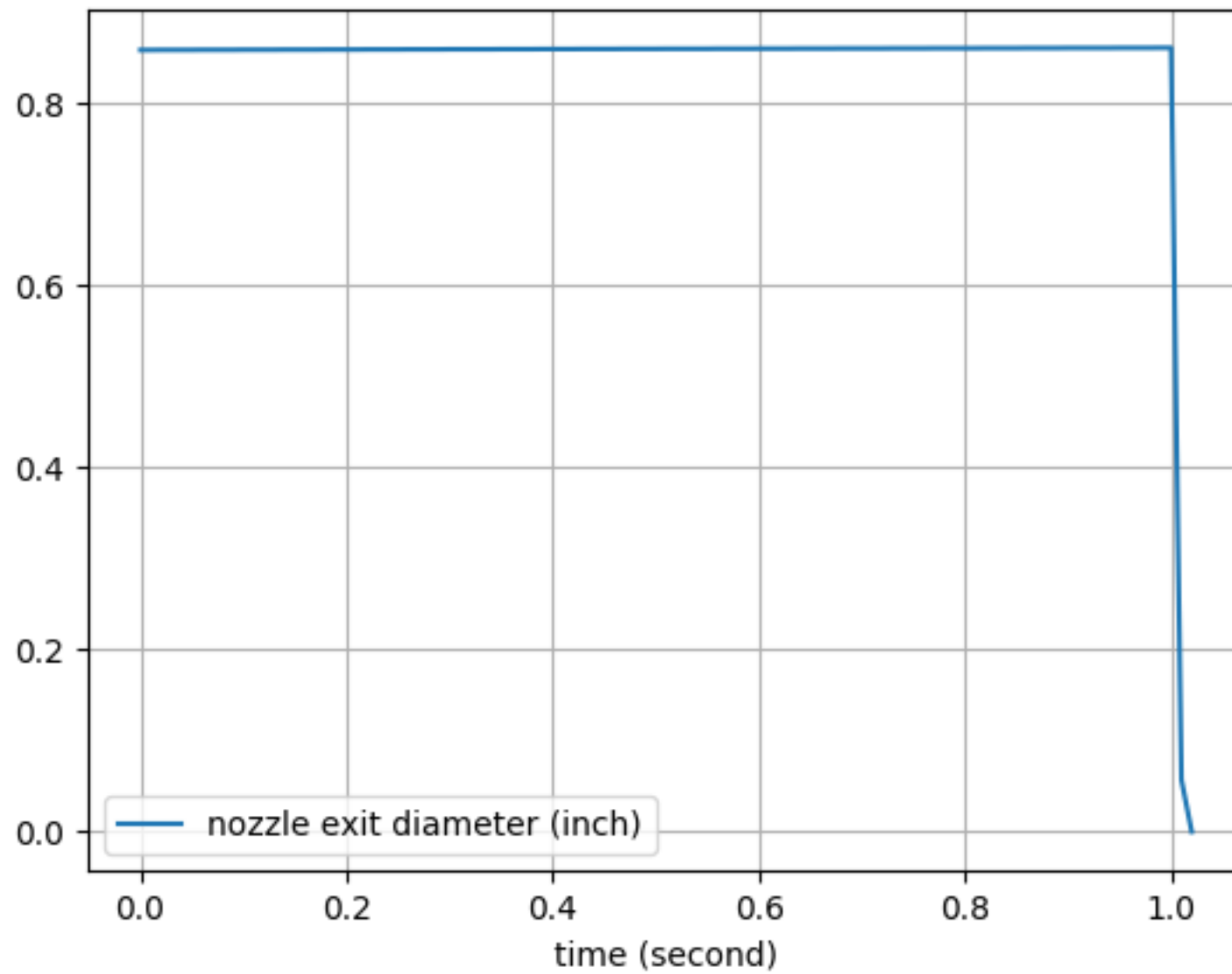
inlet velocity (mph) vs time (second)



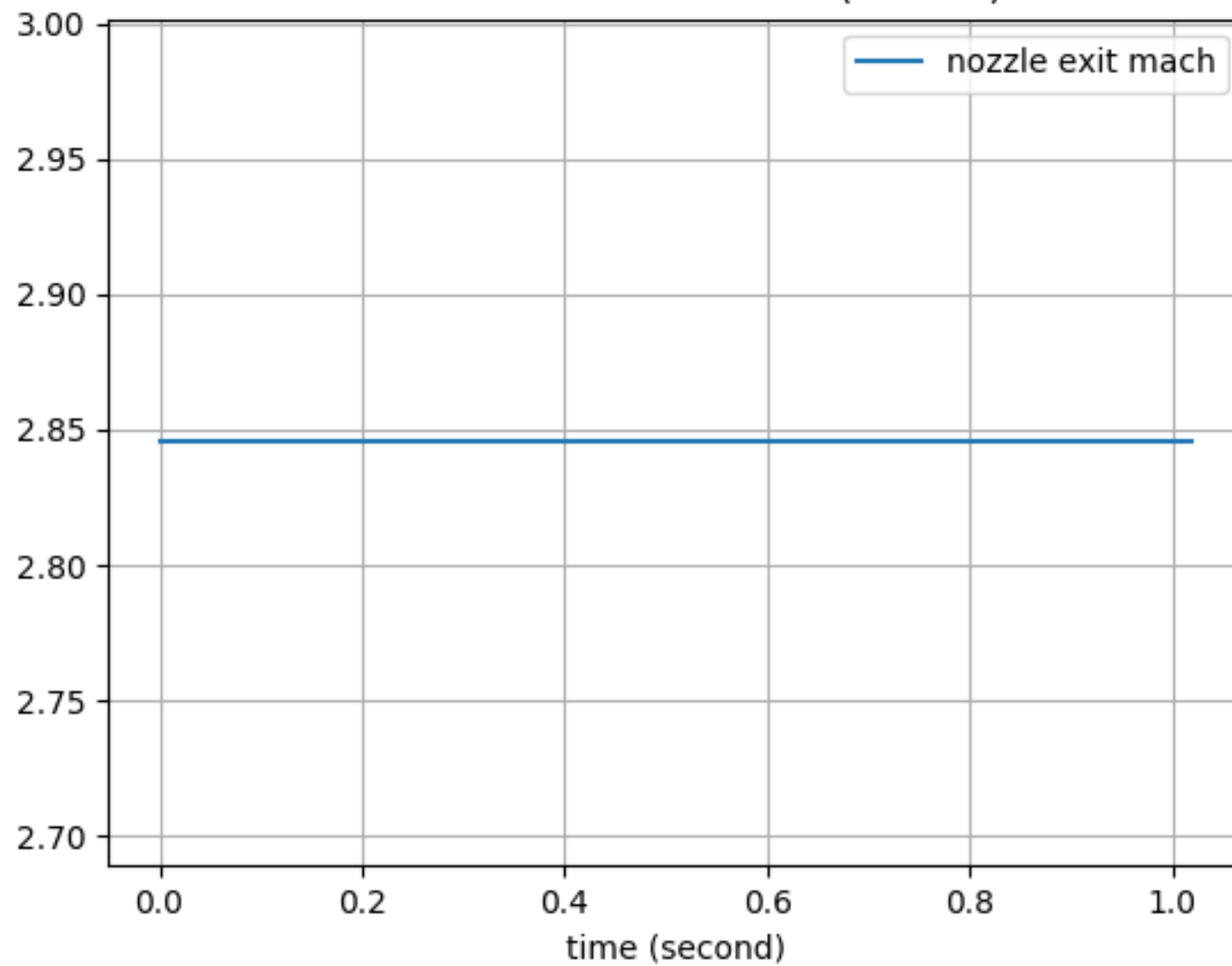




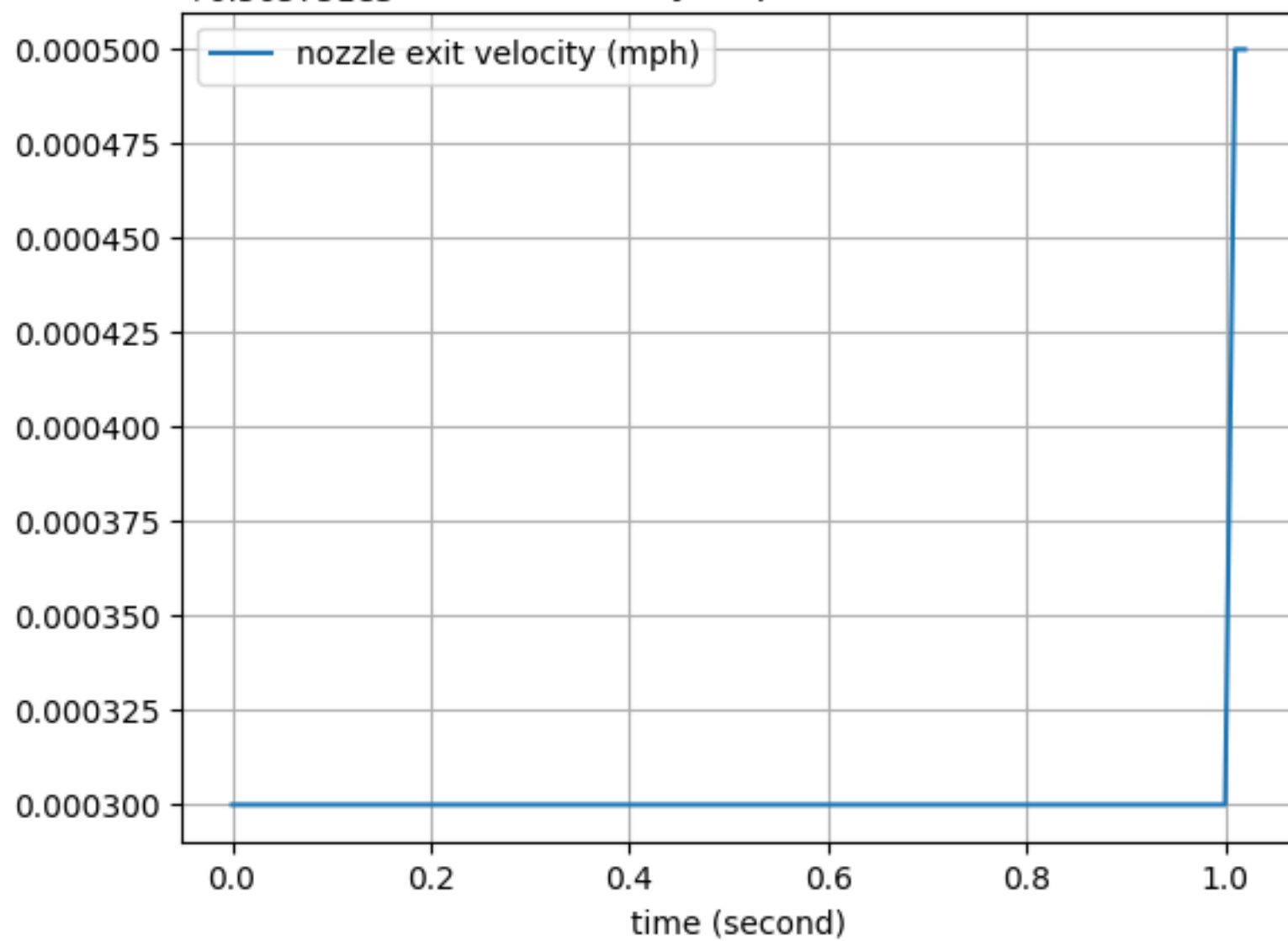
nozzle exit diameter (inch) vs time (second)

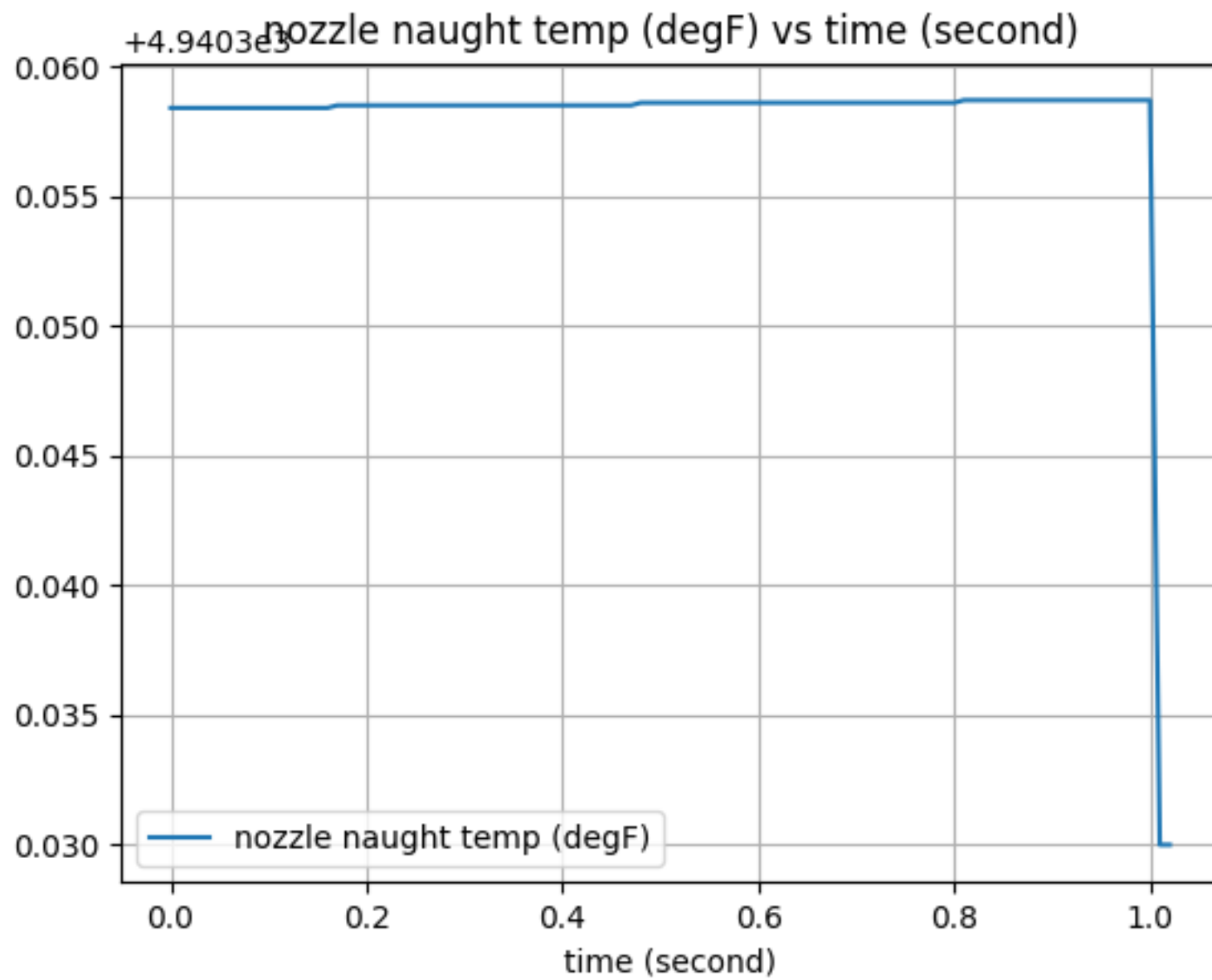


nozzle exit mach vs time (second)

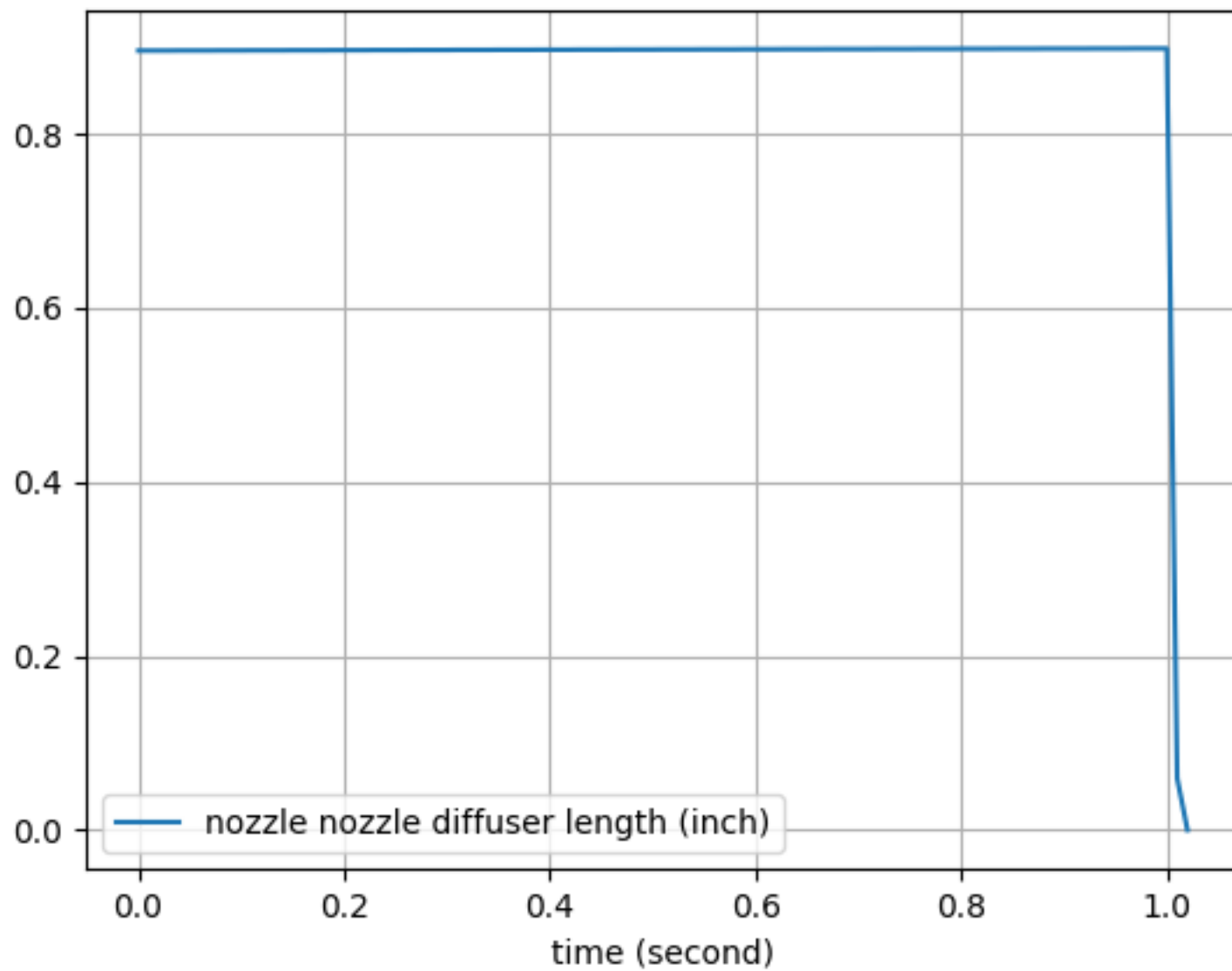


nozzle exit velocity (mph) vs time (second)

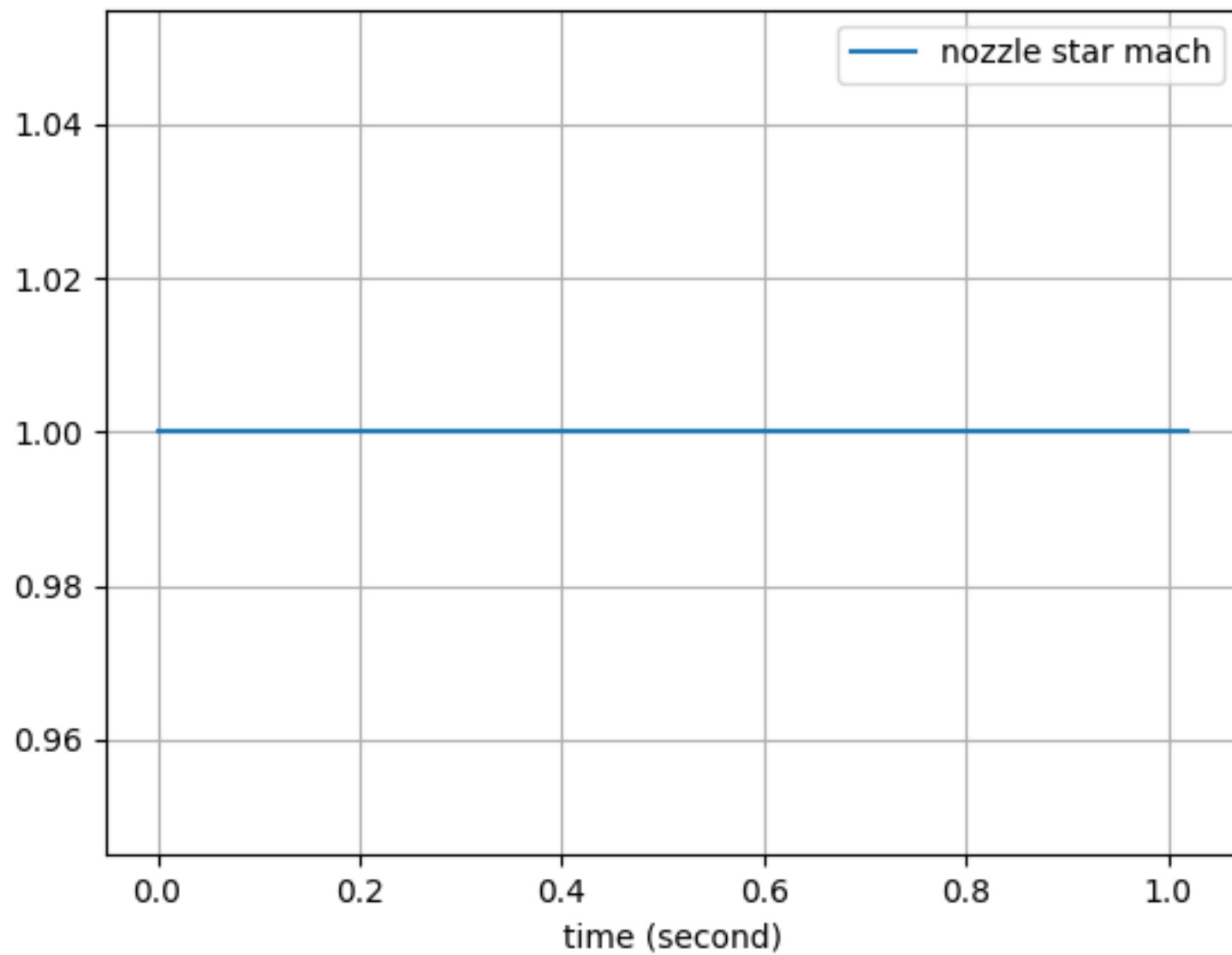




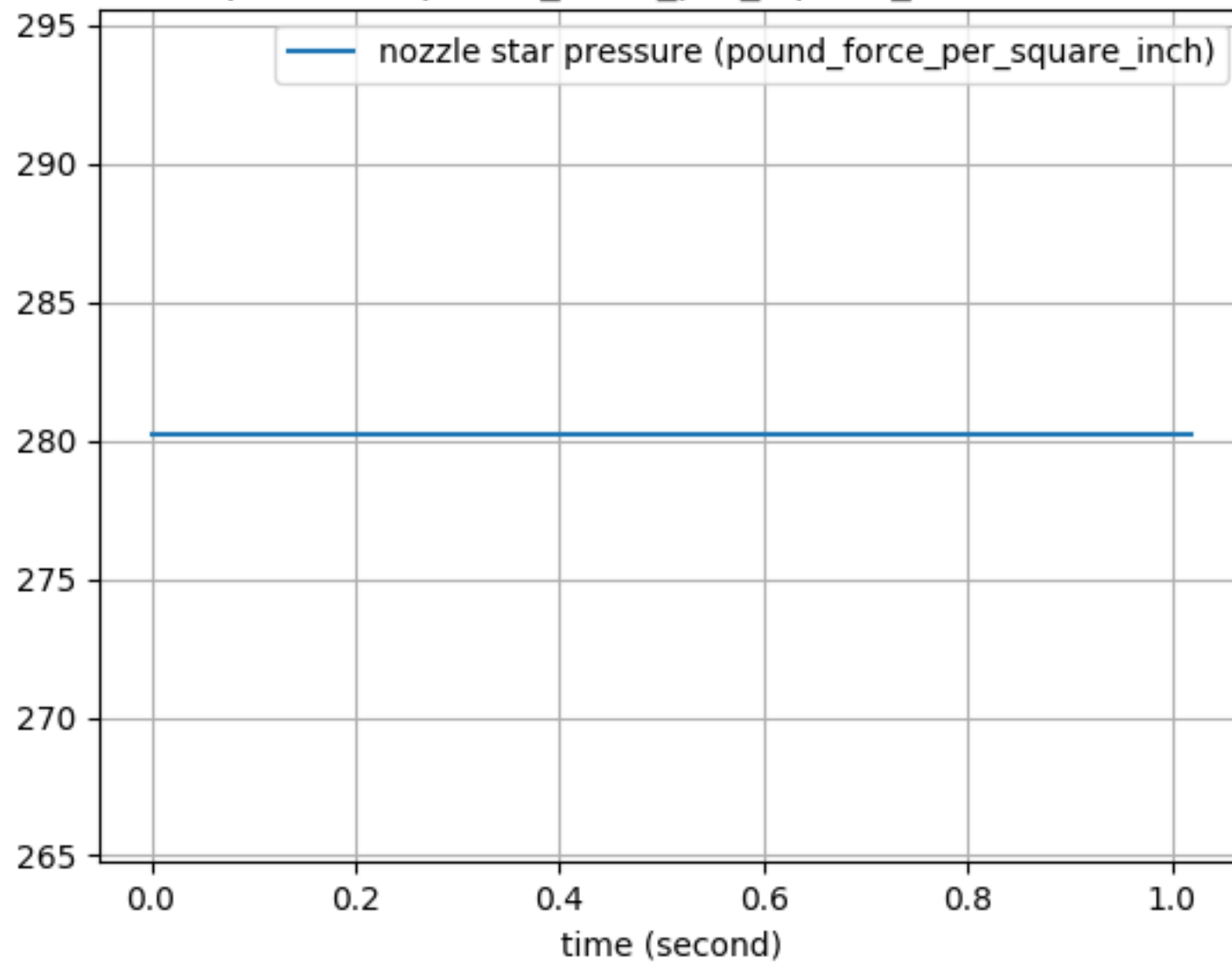
nozzle nozzle diffuser length (inch) vs time (second)



nozzle star mach vs time (second)

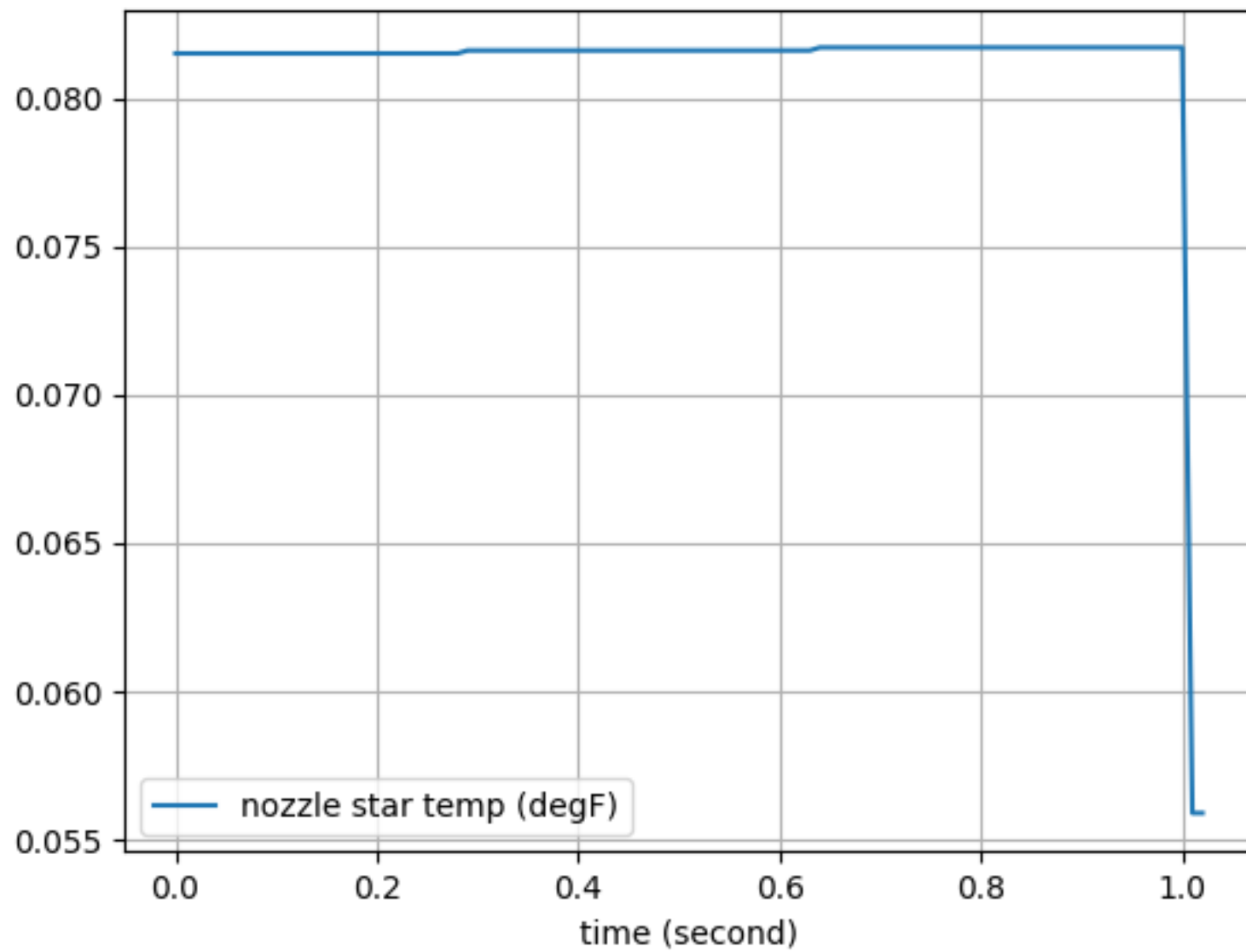


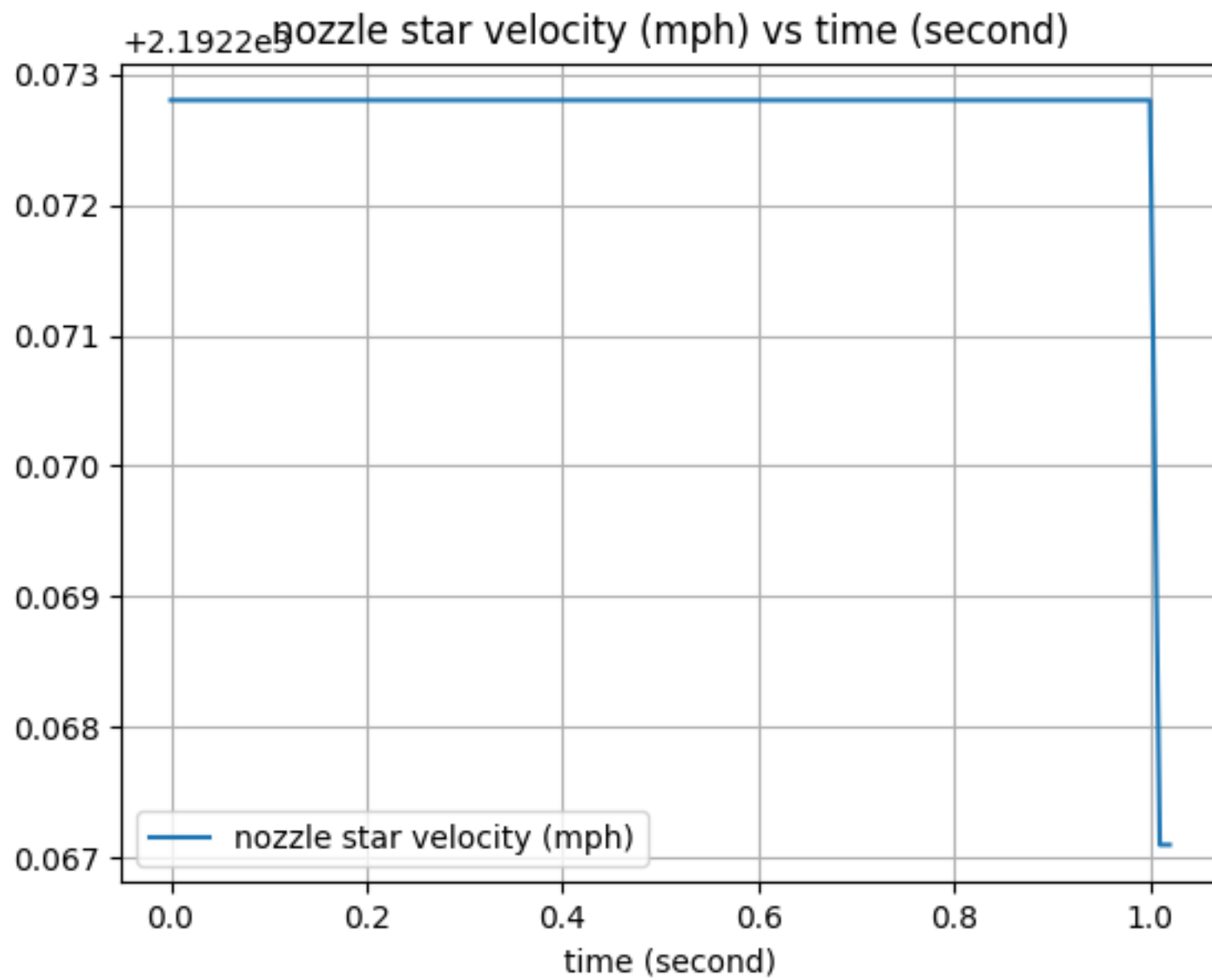
nozzle star pressure (pound\_force\_per\_square\_inch) vs time (second)



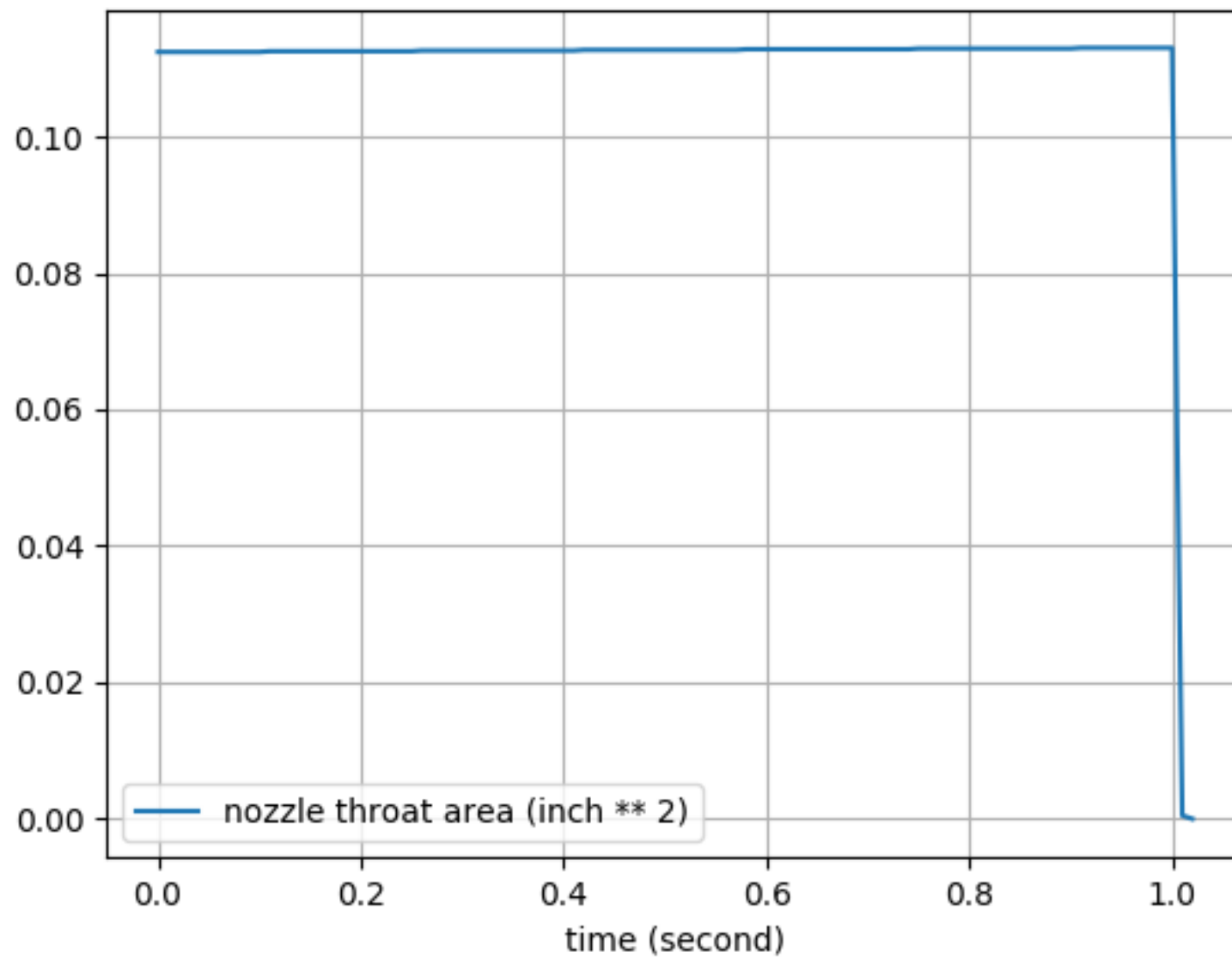


+4.403e3 nozzle star temp (degF) vs time (second)

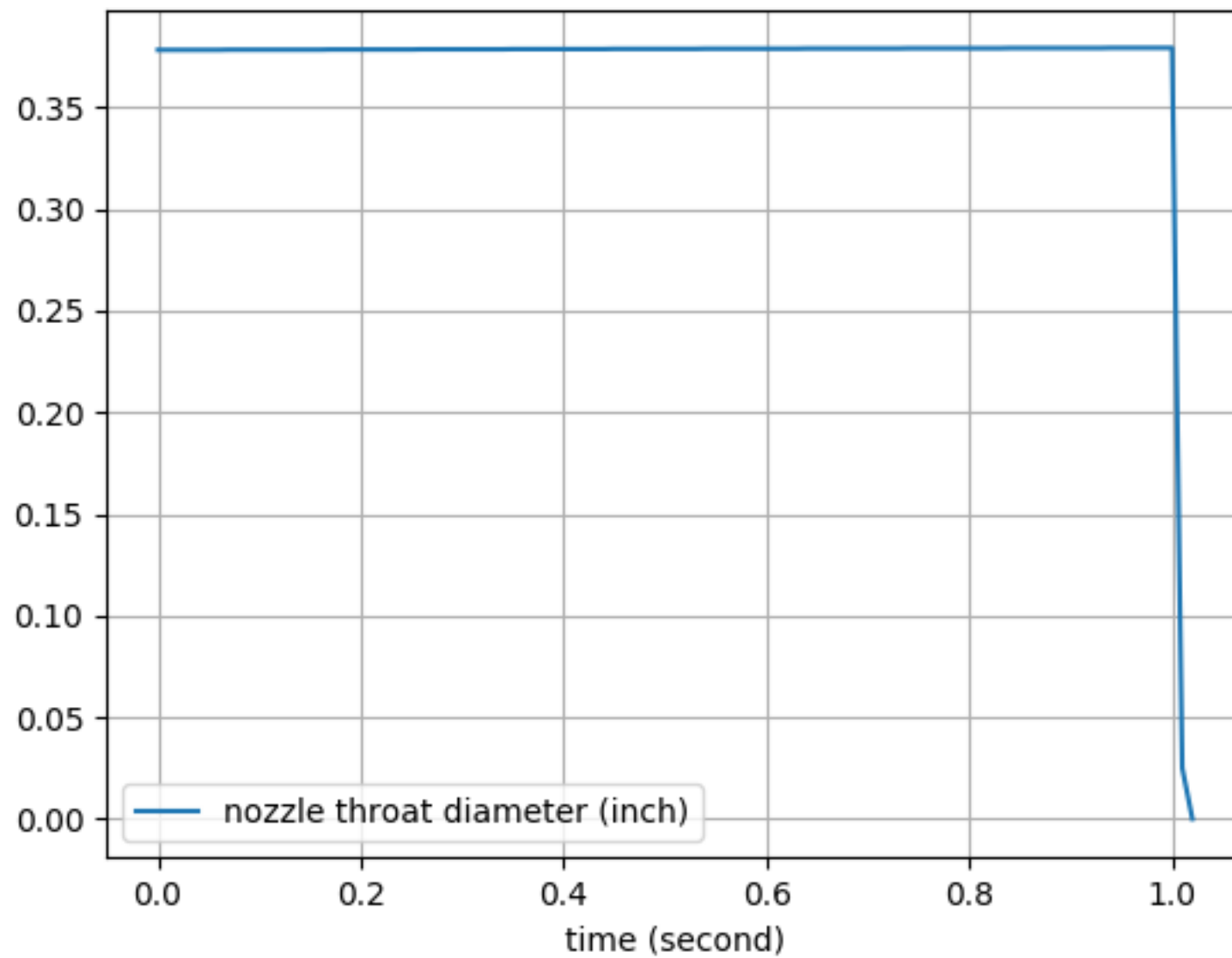




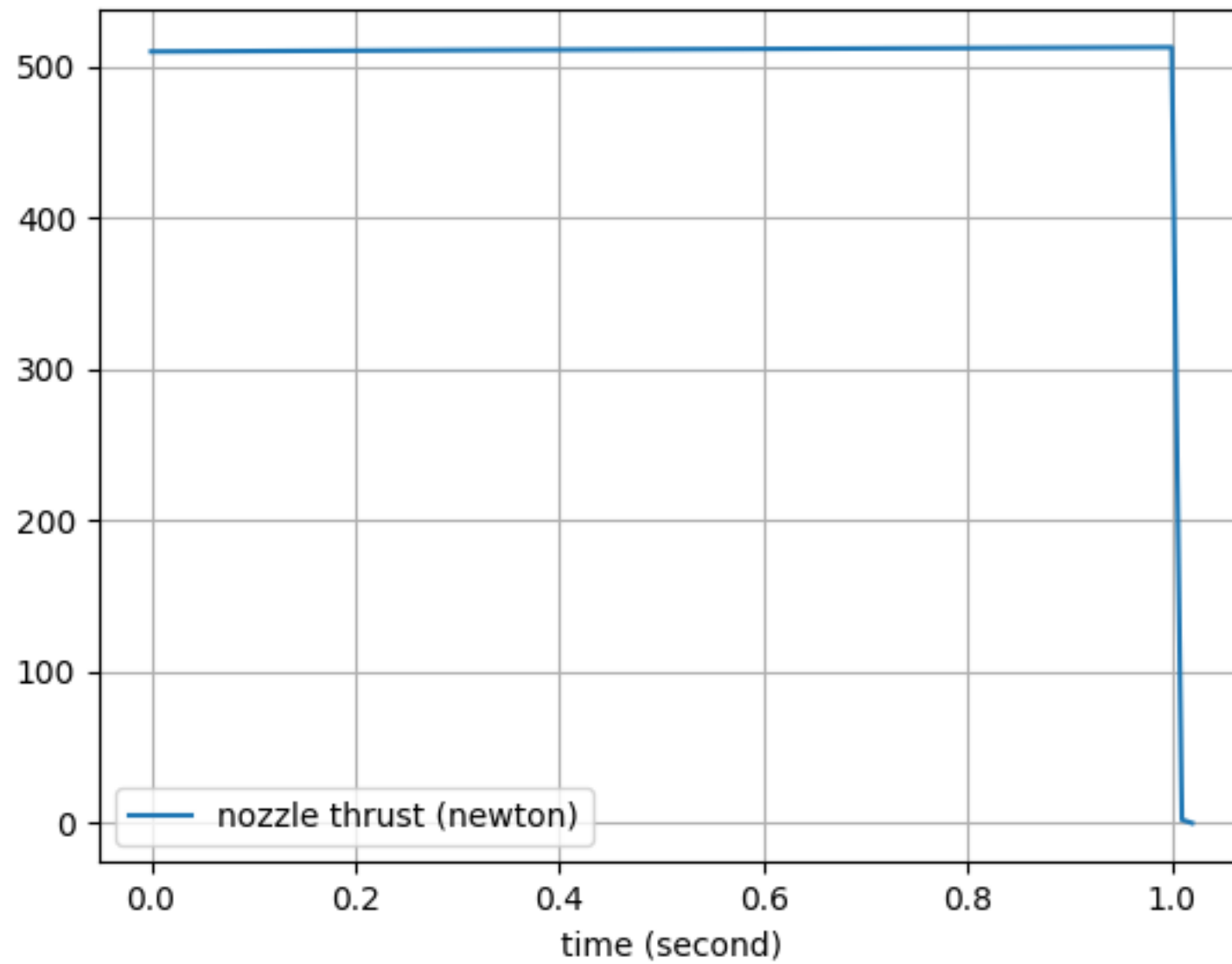
nozzle throat area (inch \*\* 2) vs time (second)



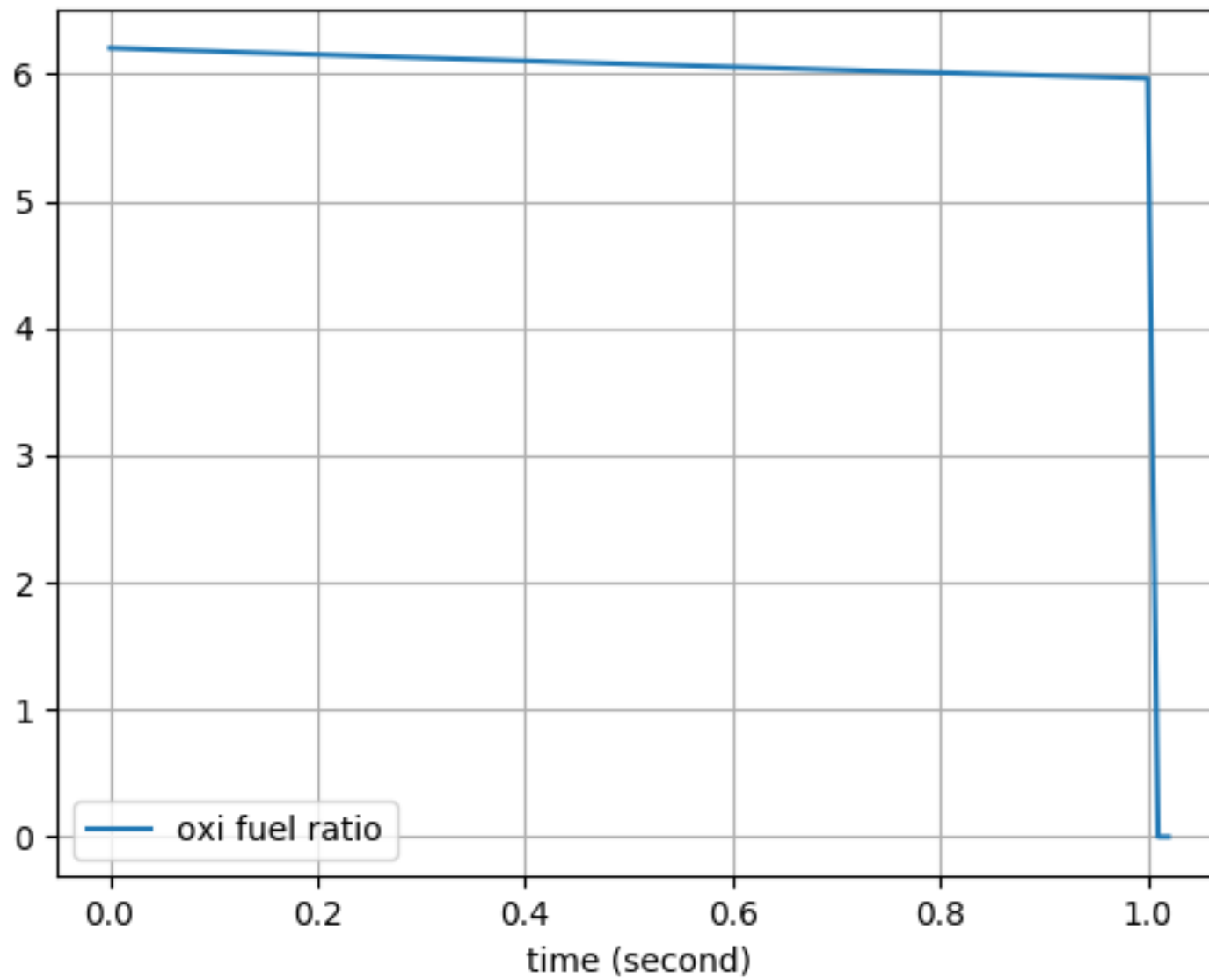
nozzle throat diameter (inch) vs time (second)



nozzle thrust (newton) vs time (second)



oxi fuel ratio vs time (second)



oxidiser mass flow rate (pound / second) vs time (second)

