

Ideal Nozzle Simulation Inputs:

a: 0.05 meter ** 2 / kilogram

n: 0.65

m: -0.2

Oxidiser:

Initial Volume: 0.41 liter

Initial Mass: 0.5 lbs

Injector Mass Flow Rate: 0.042 kilogram / second

Number of Injectors: 1

Ideal O/F Ratio: 4.83

External Temp: 90 degF

Time Step: 0.001 second

Simulation Results:

Total Burn Time: 5.366 second

Impulse: 832.29 newton * second

Average Thrust: 155.1 newton

Motor: J155

Nozzle Results:

Suggested Throat Diameter: 0.208 inch

Suggested Exit Diameter: 0.473 inch

Suggested Diffuser Length: 0.494 inch

Fuel Grain

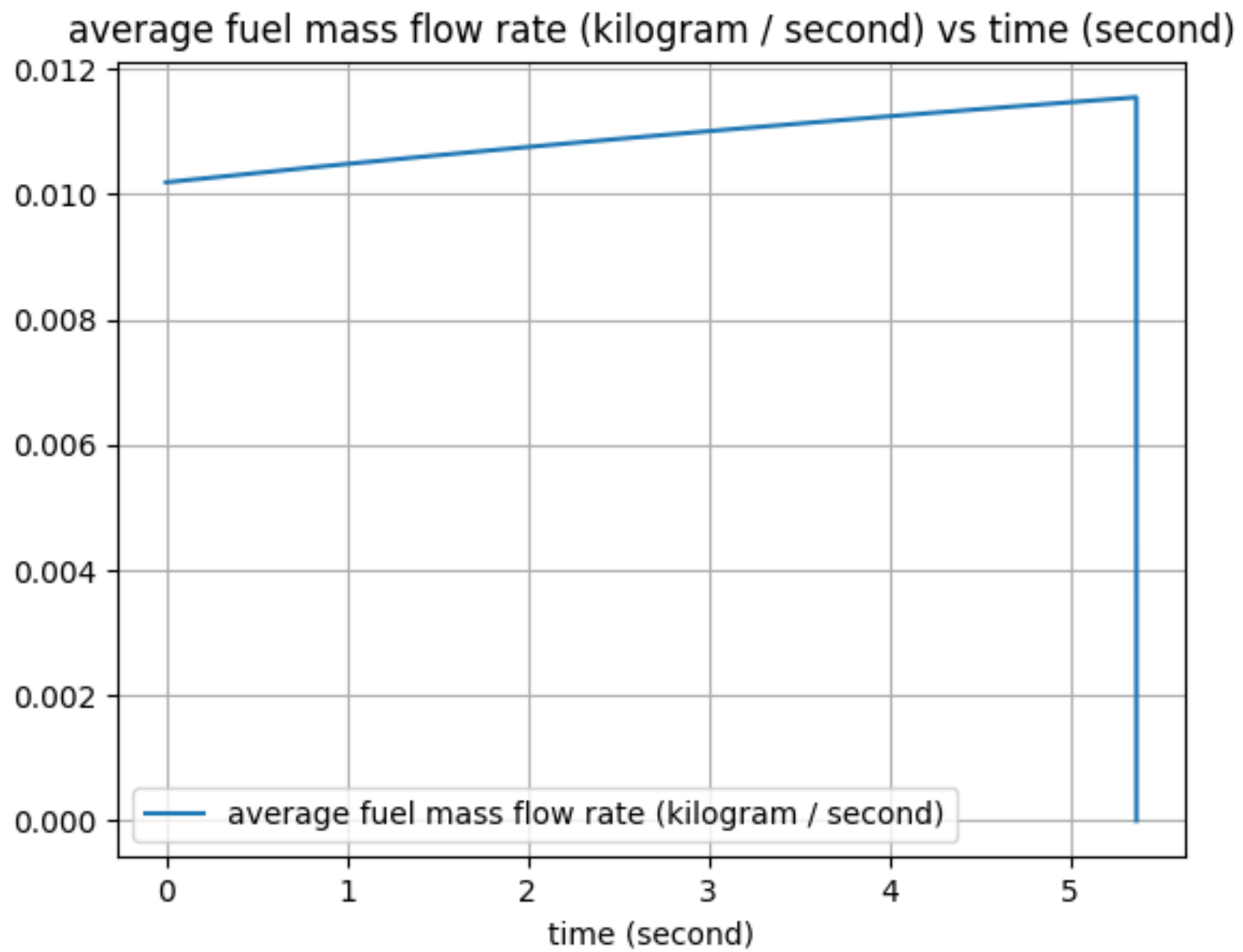
Port Length: 13.4 inch

Fuel Density: 3.96 kilogram / meter ** 3

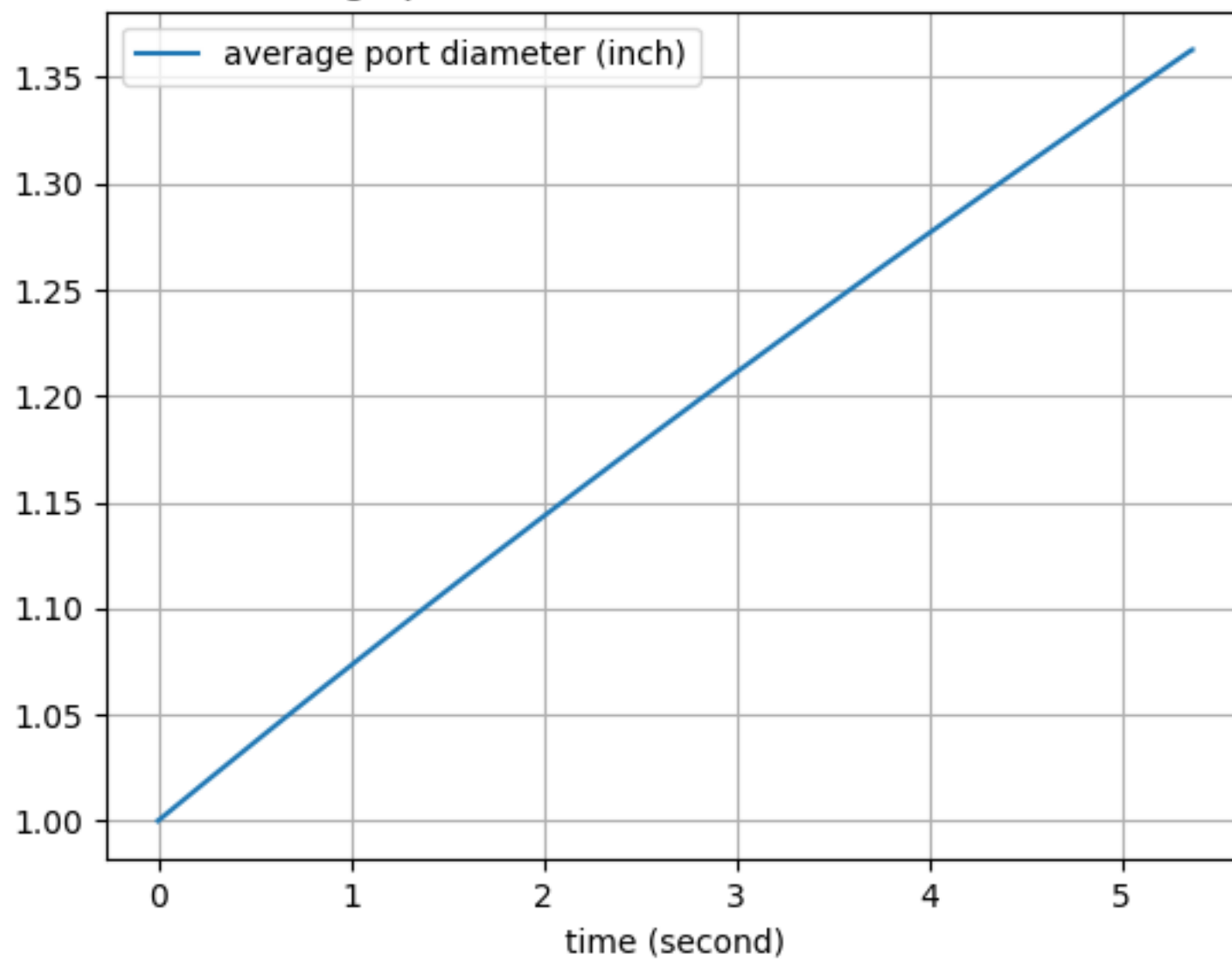
Grain Diameter: 1.75 inch

Initial Port Diameter: 1.0 inch

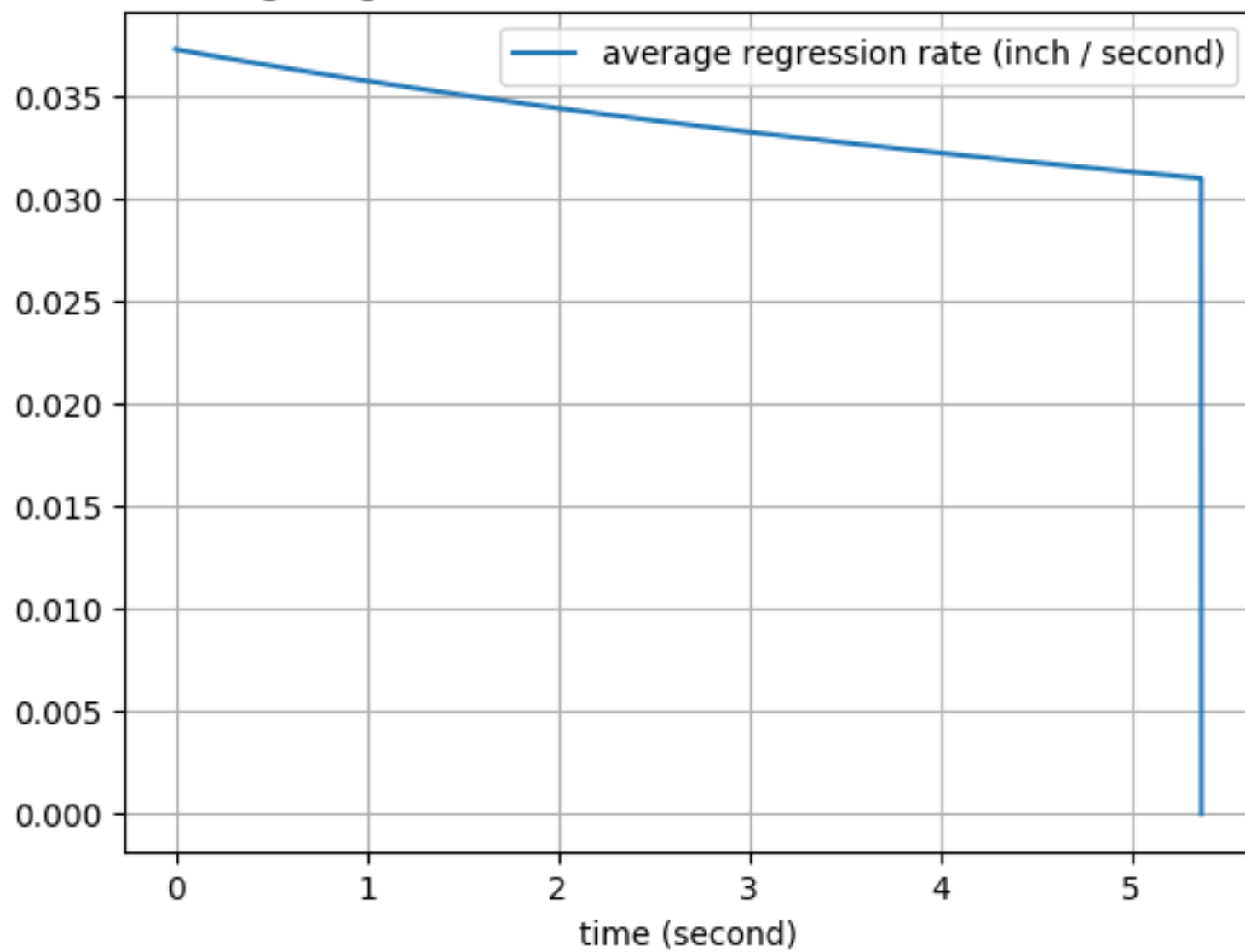
Final Port Diameter: 1.363 inch



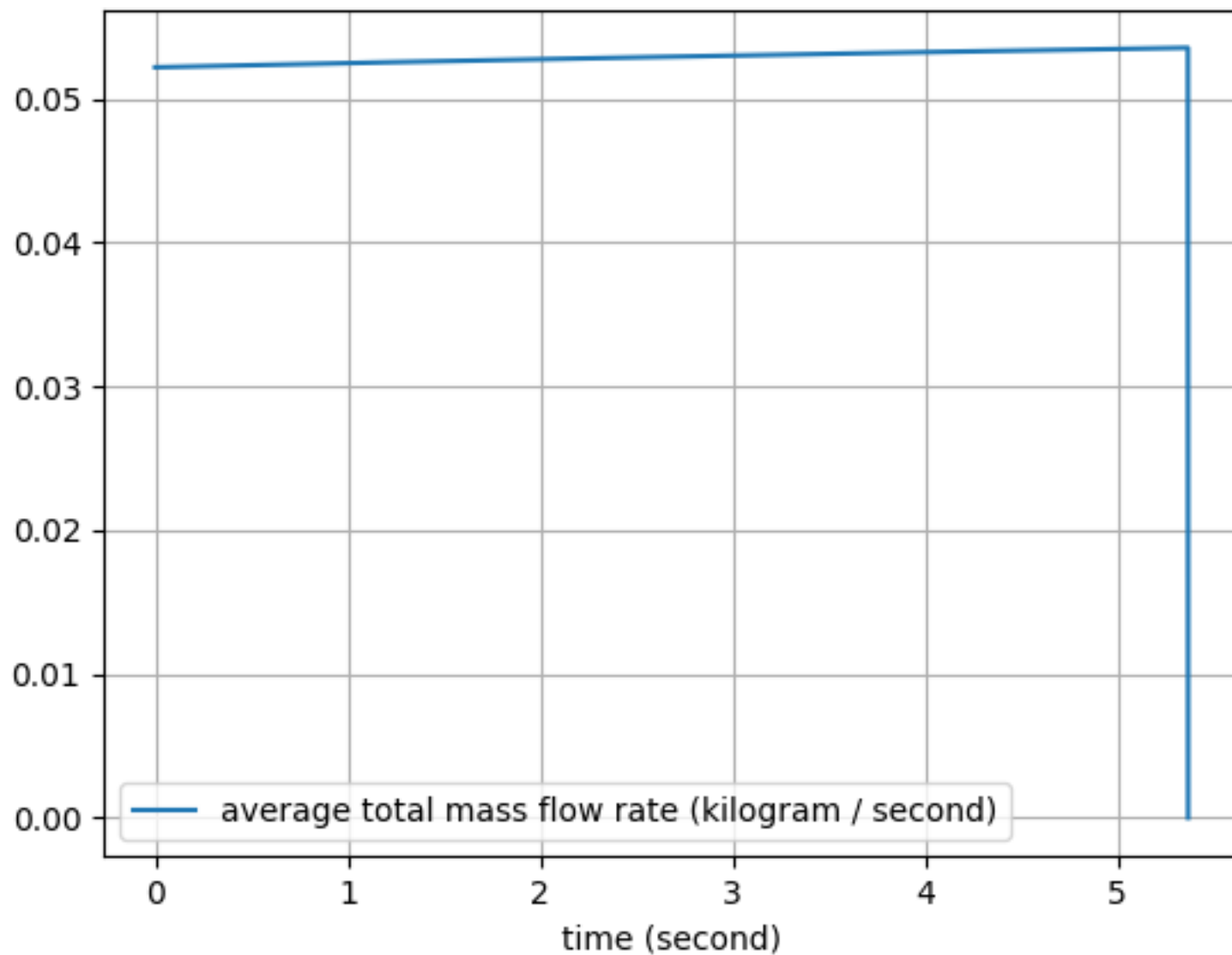
average port diameter (inch) vs time (second)



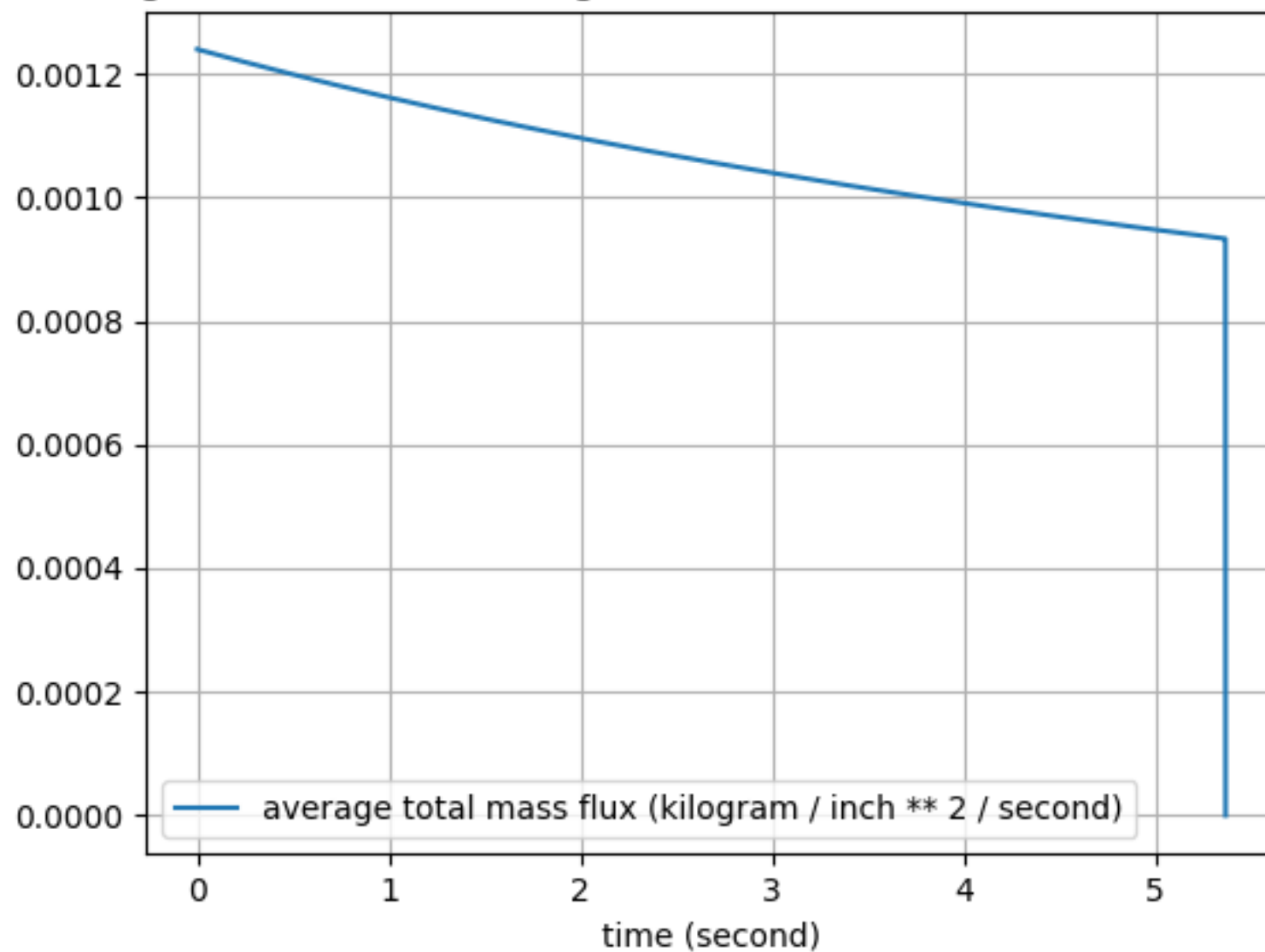
average regression rate (inch / second) vs time (second)



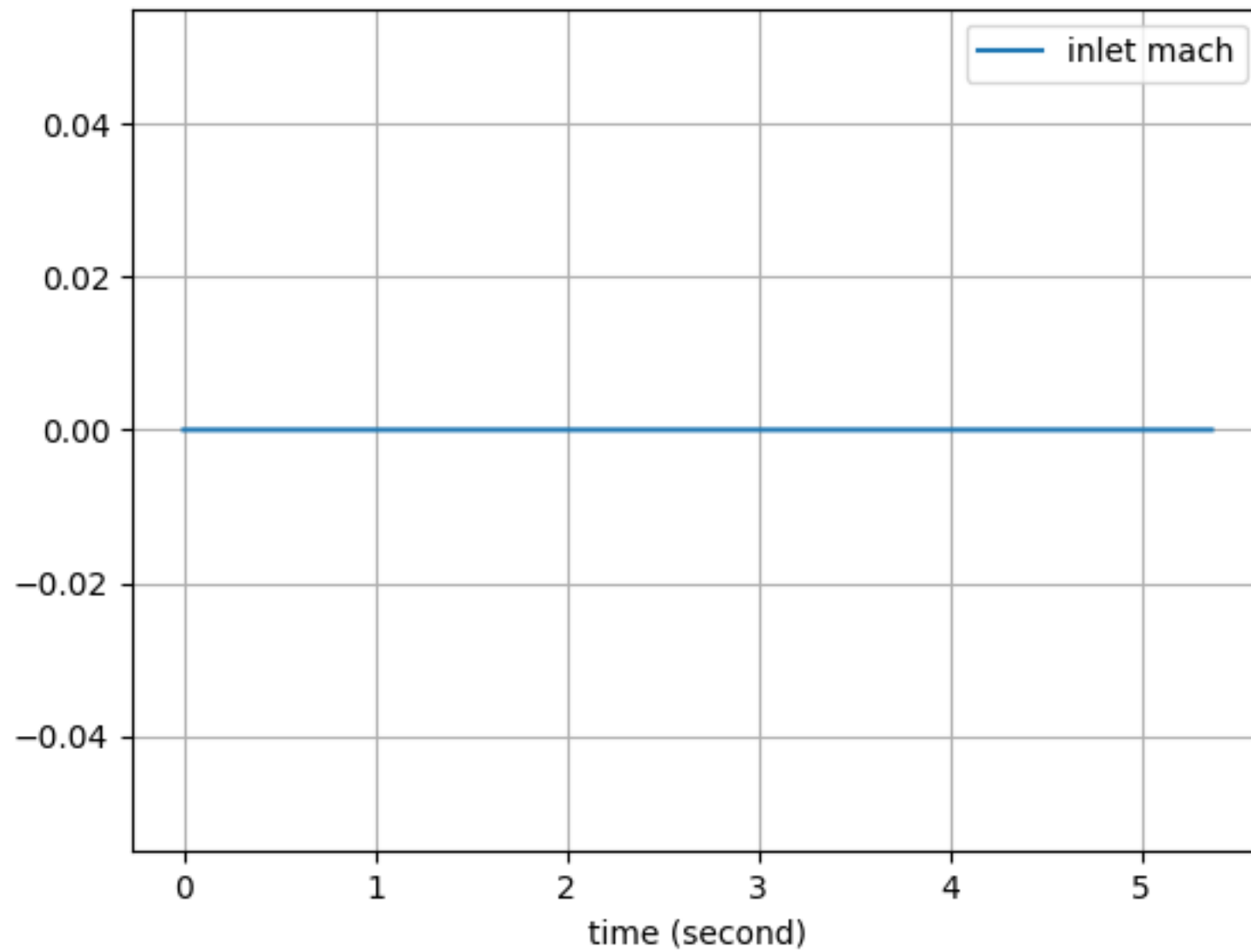
average total mass flow rate (kilogram / second) vs time (second)



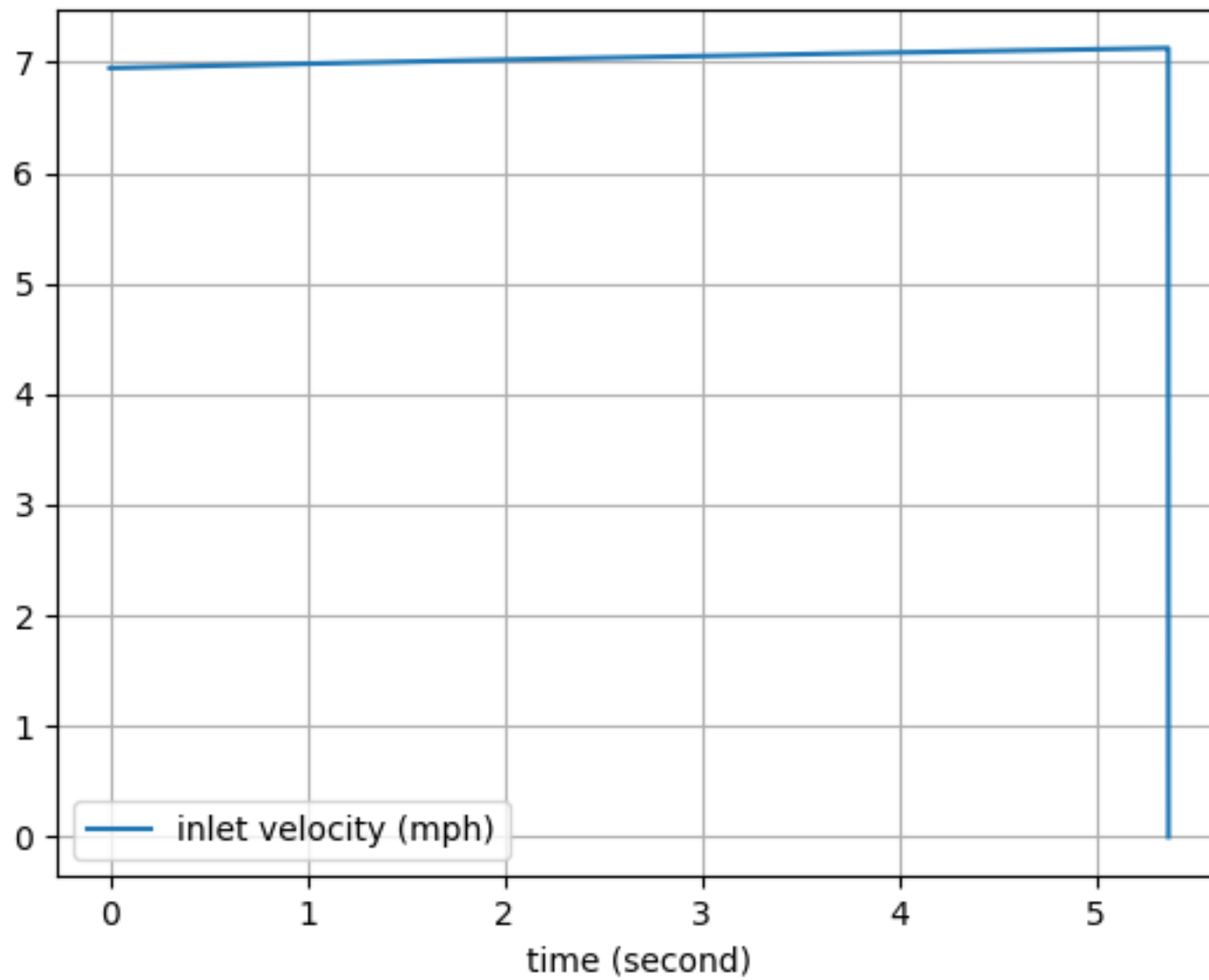
average total mass flux (kilogram / inch ** 2 / second) vs time (second)



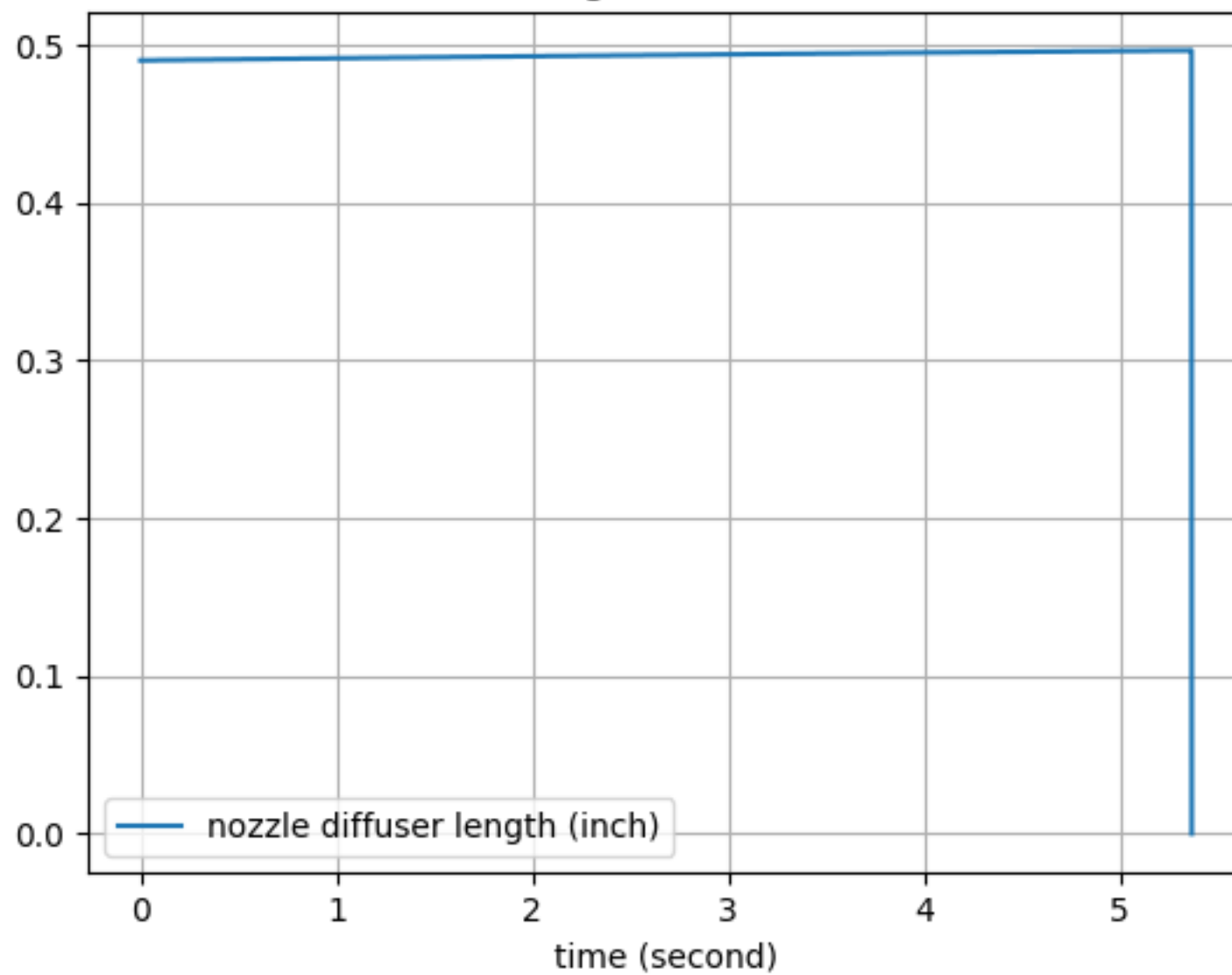
inlet mach vs time (second)



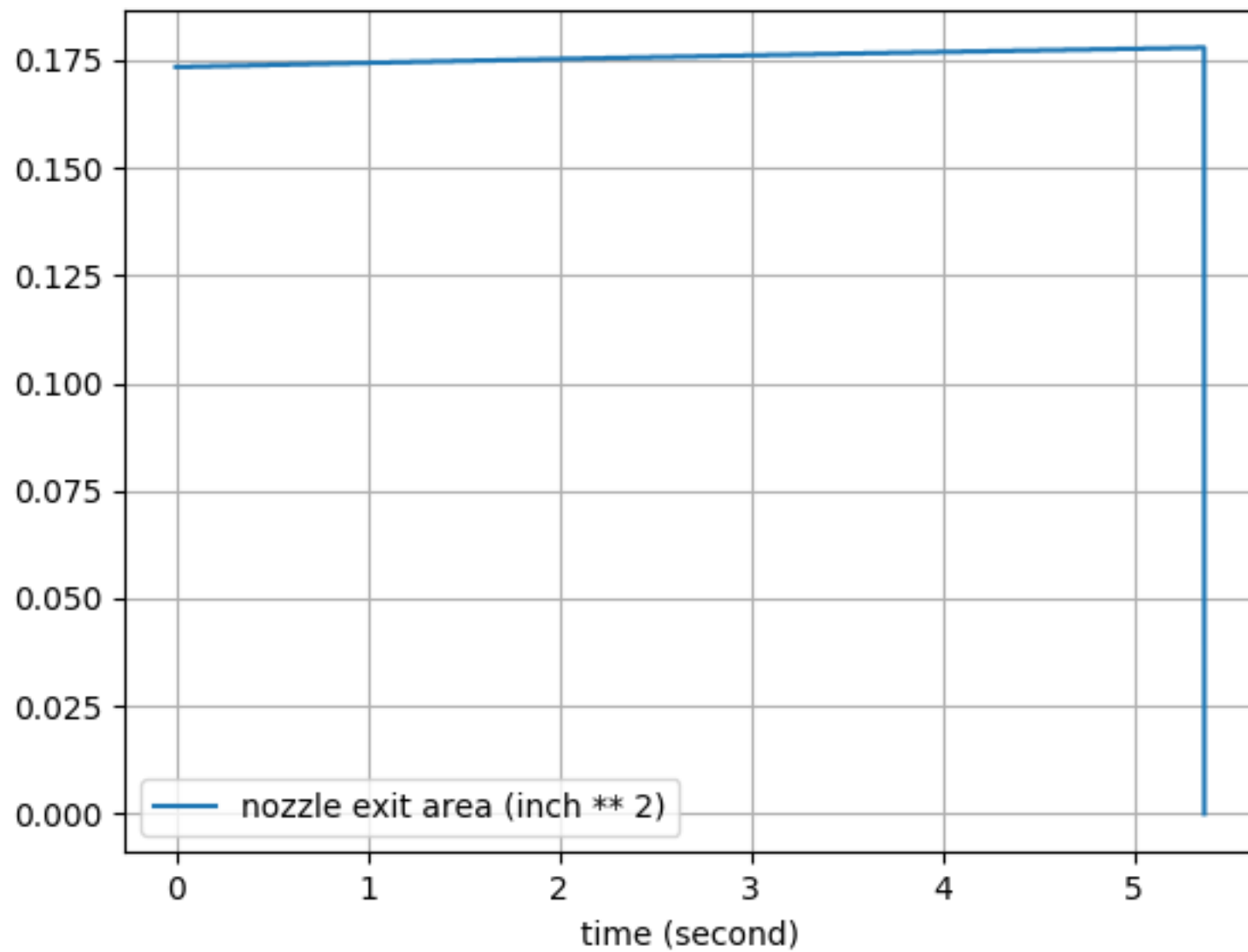
inlet velocity (mph) vs time (second)

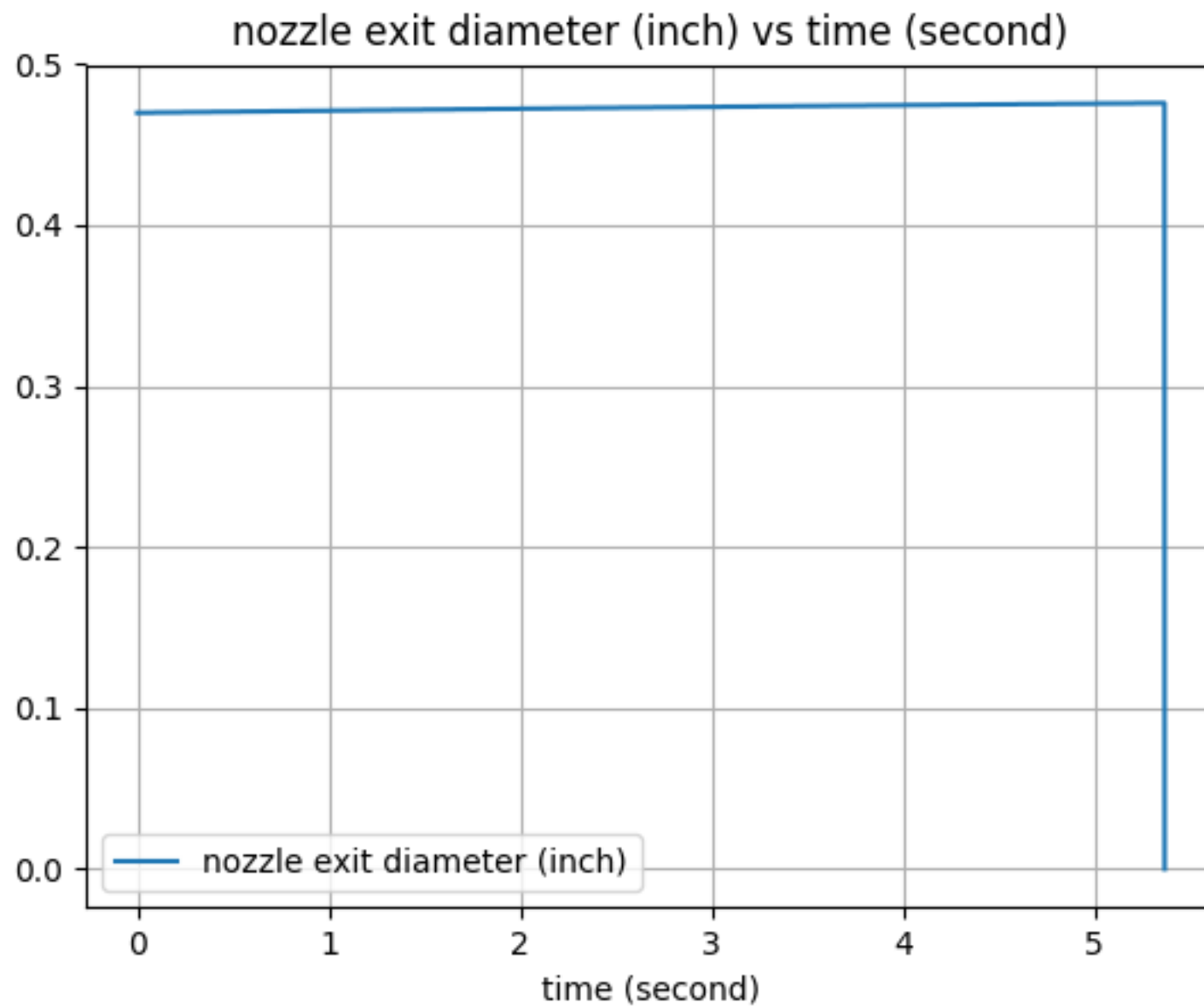


nozzle diffuser length (inch) vs time (second)

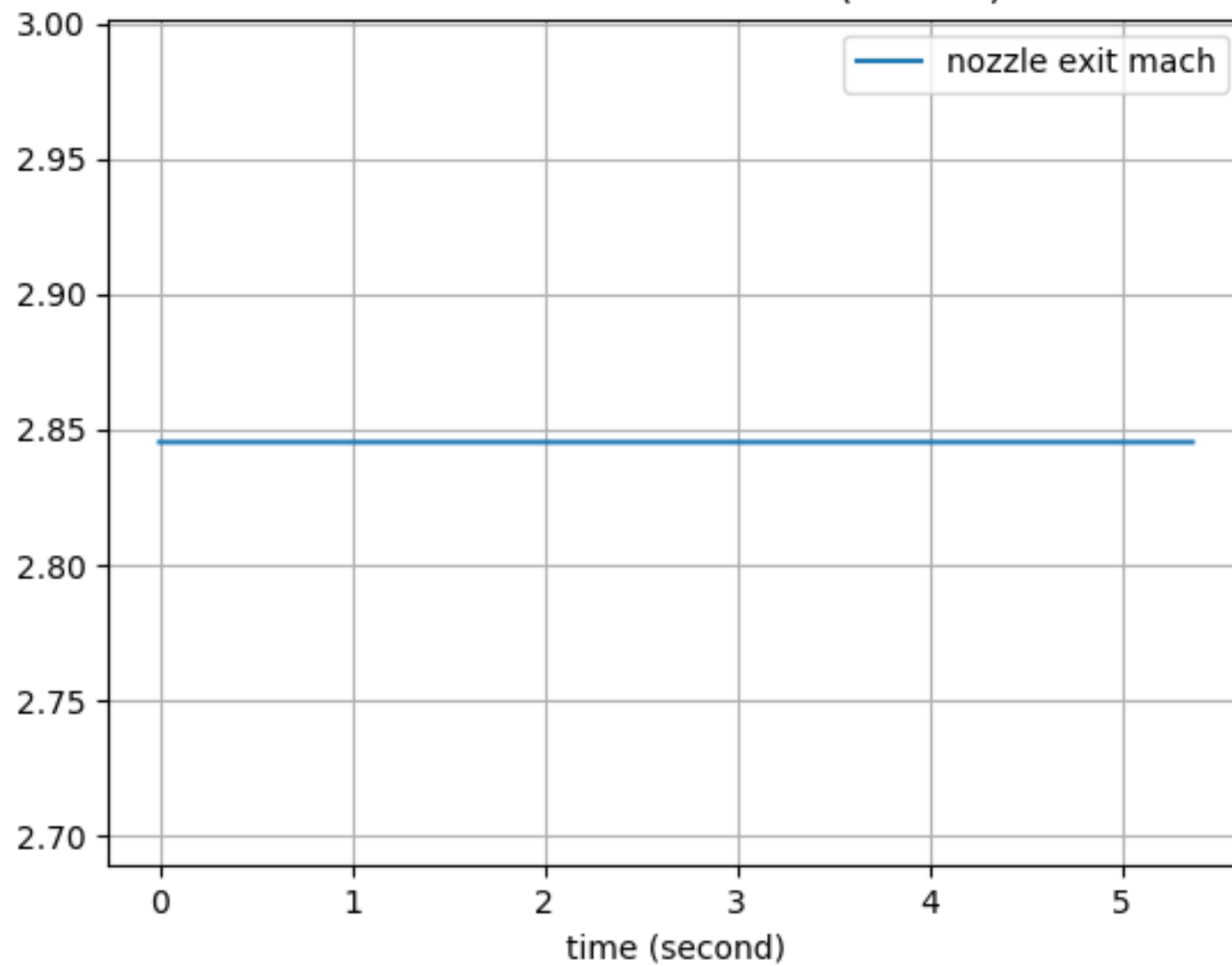


nozzle exit area (inch ** 2) vs time (second)

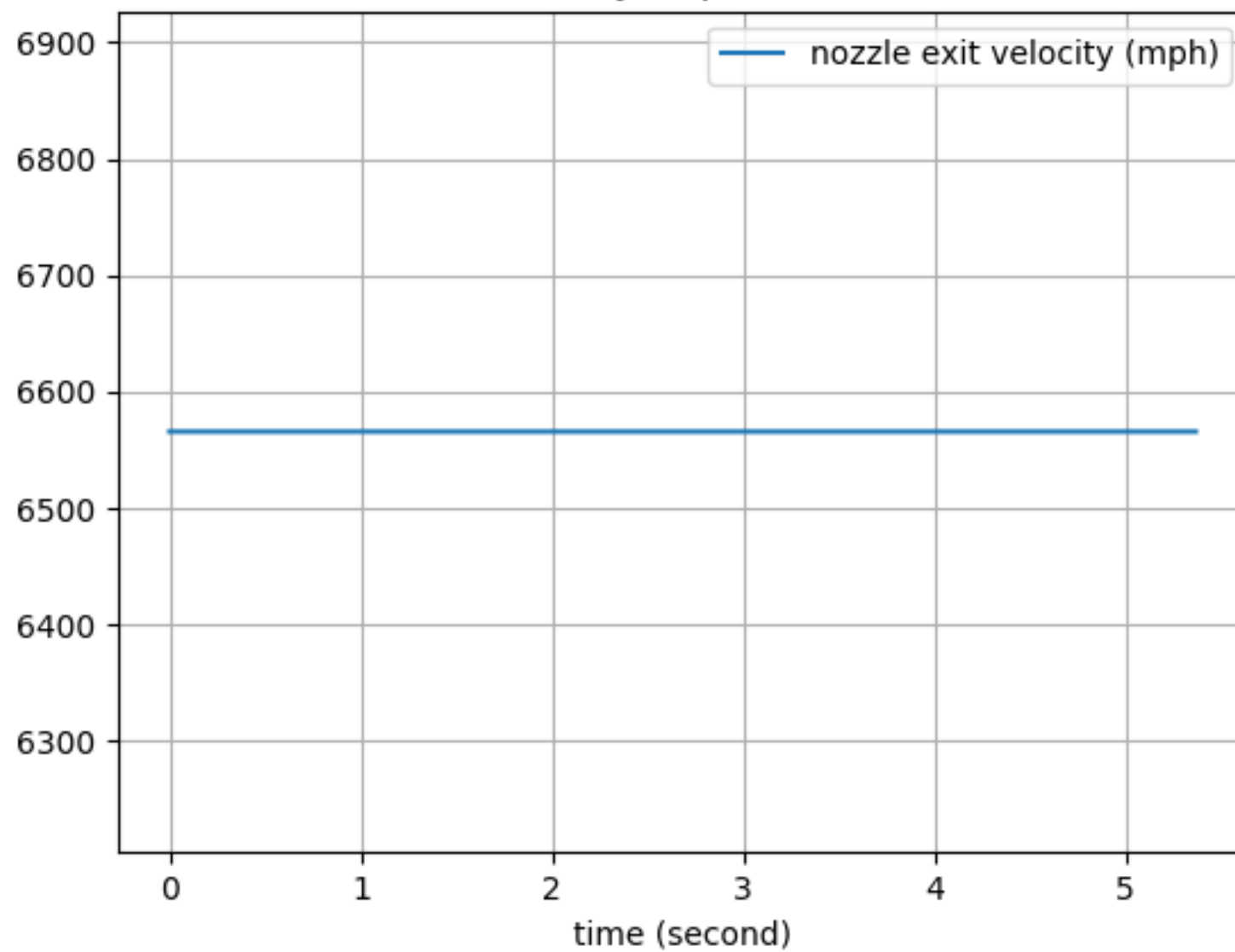




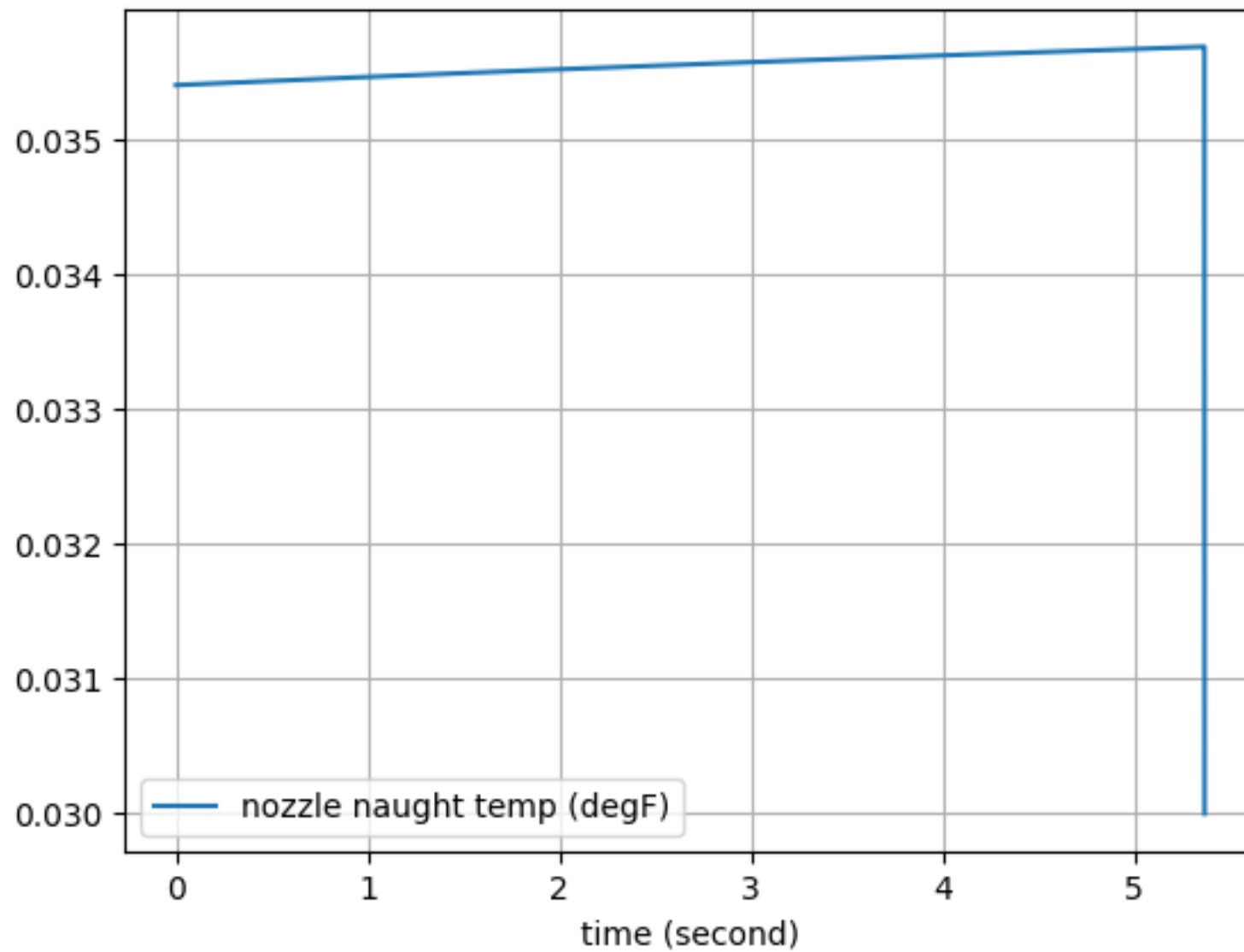
nozzle exit mach vs time (second)



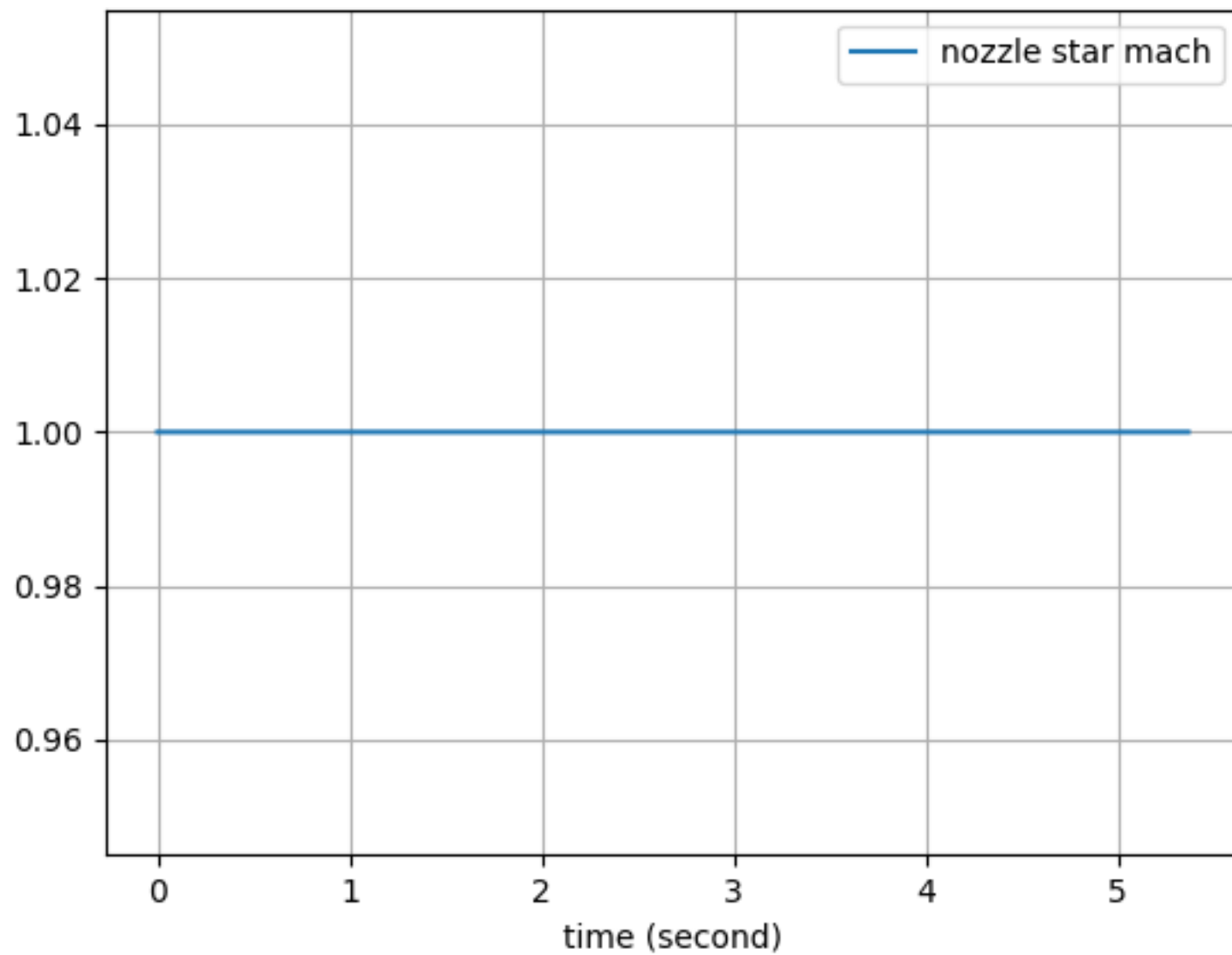
nozzle exit velocity (mph) vs time (second)



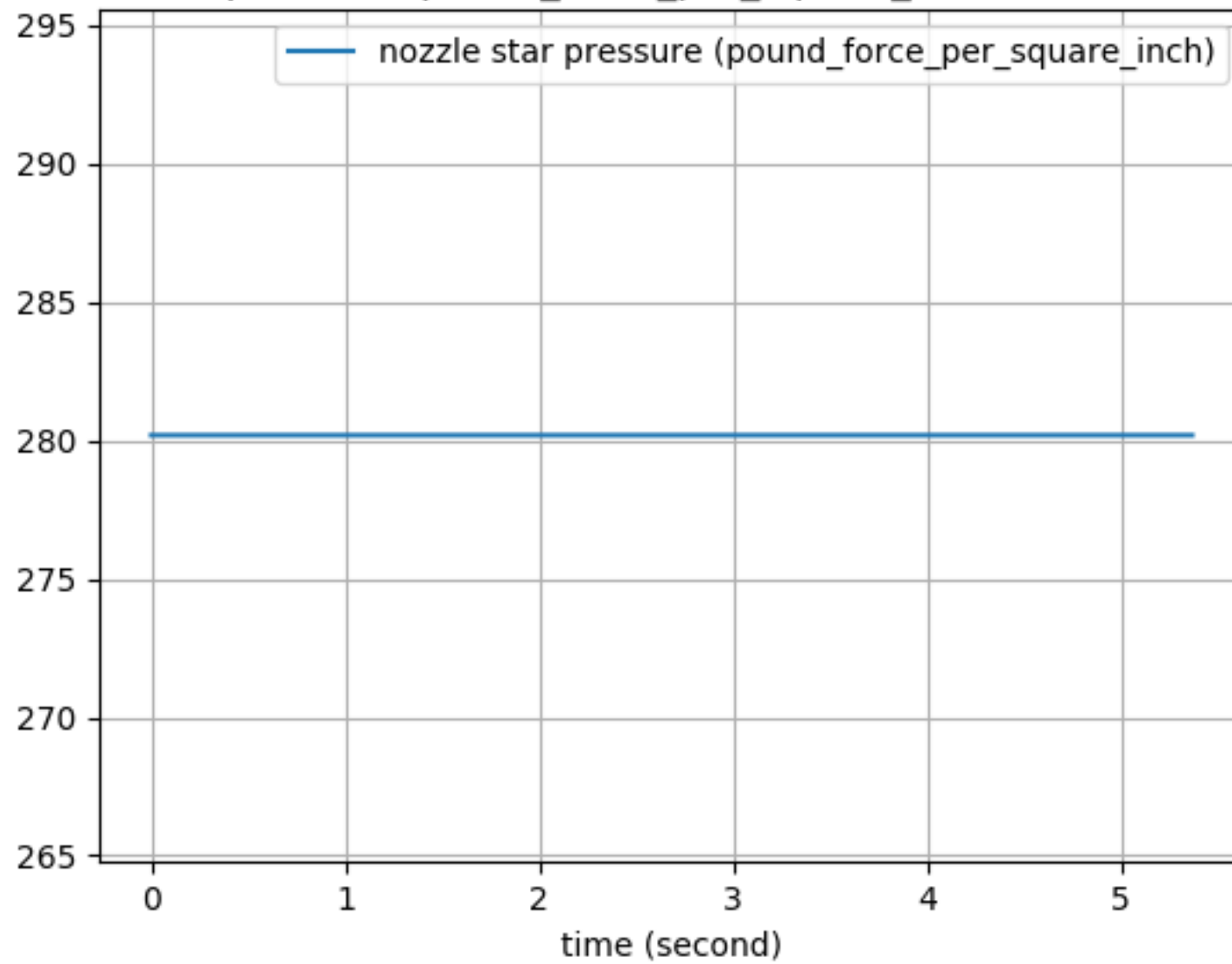
nozzle naught temp (degF) vs time (second)



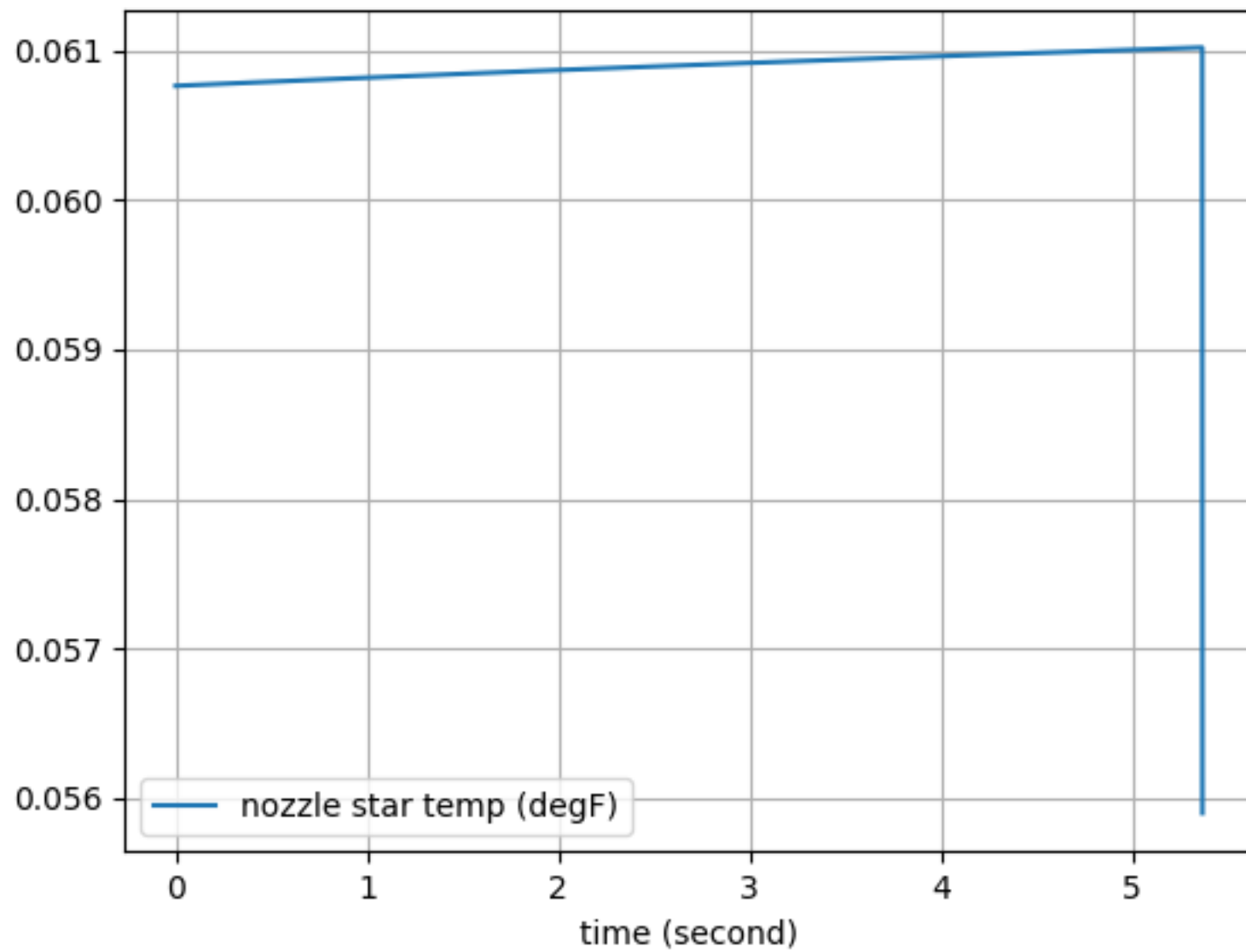
nozzle star mach vs time (second)



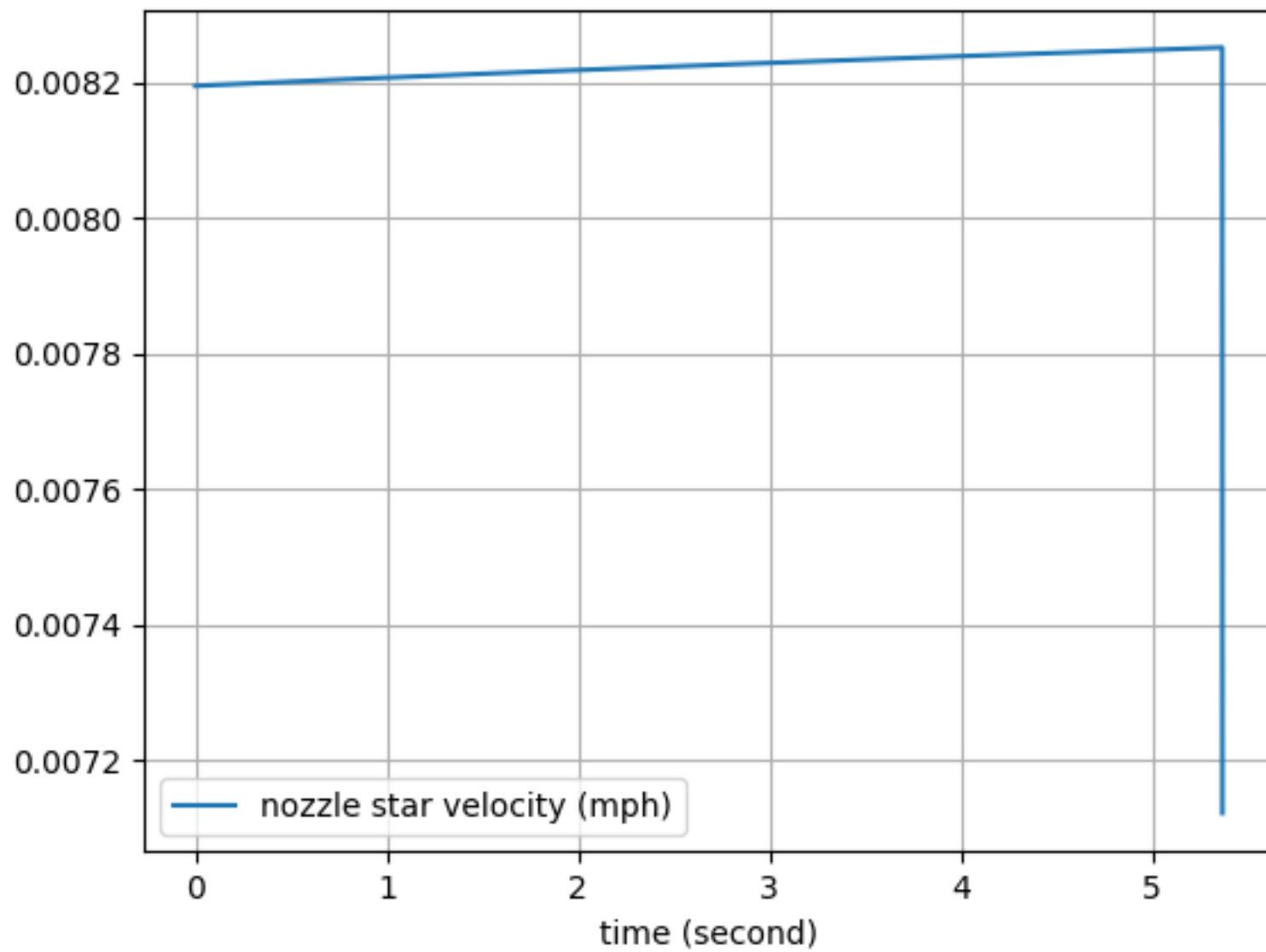
nozzle star pressure (pound_force_per_square_inch) vs time (second)



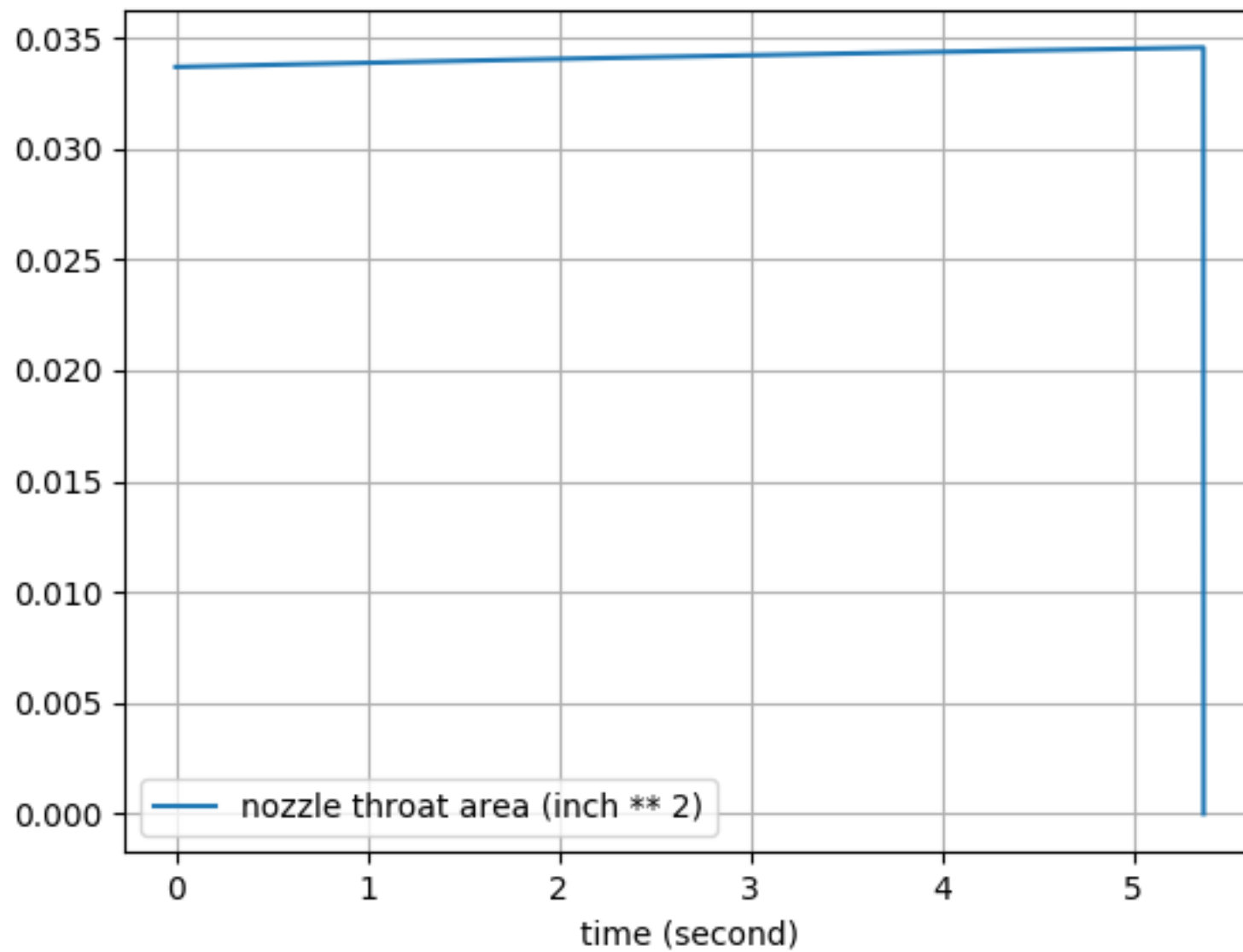
+4.403e3 nozzle star temp (degF) vs time (second)



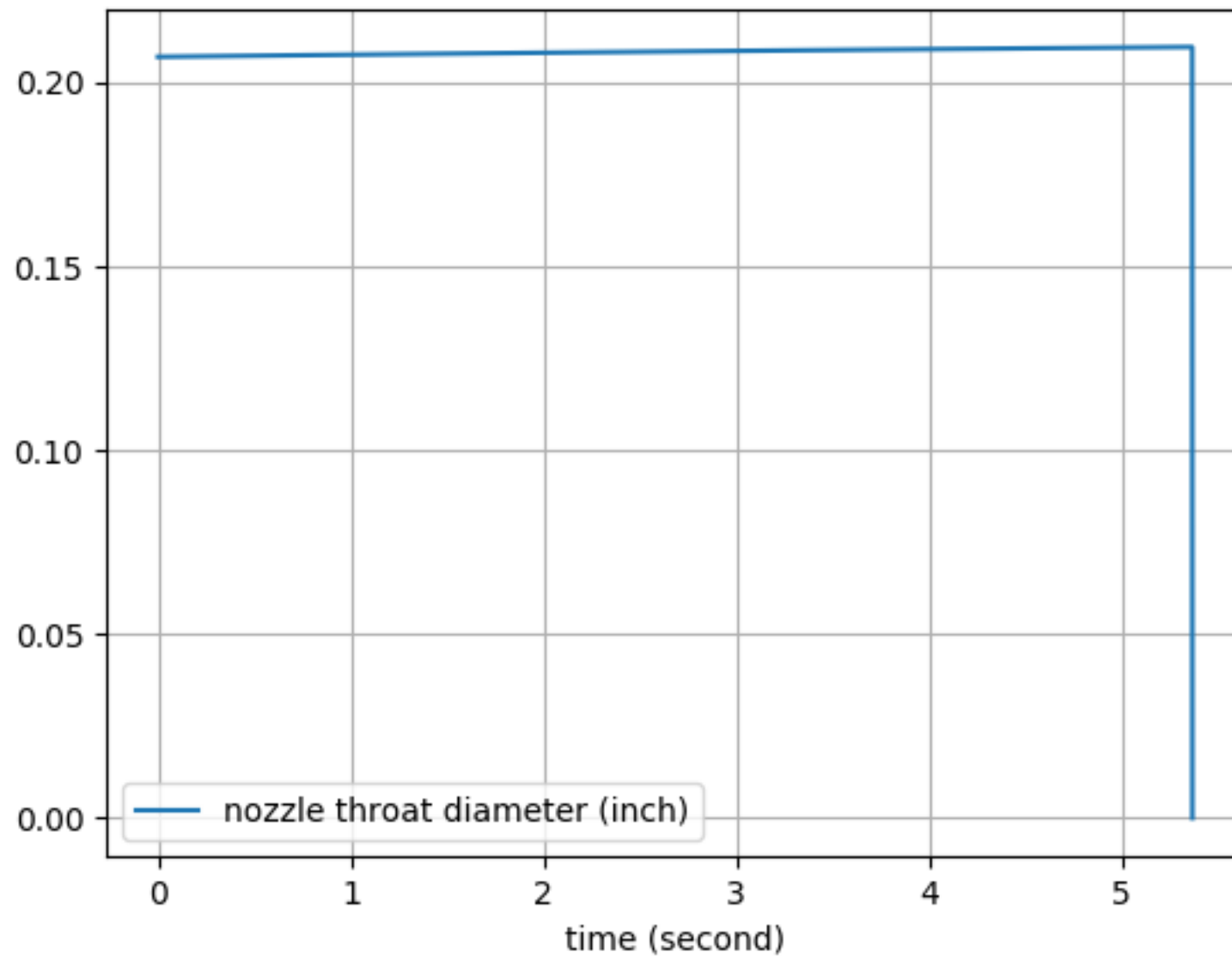
+2.192269 nozzle star velocity (mph) vs time (second)



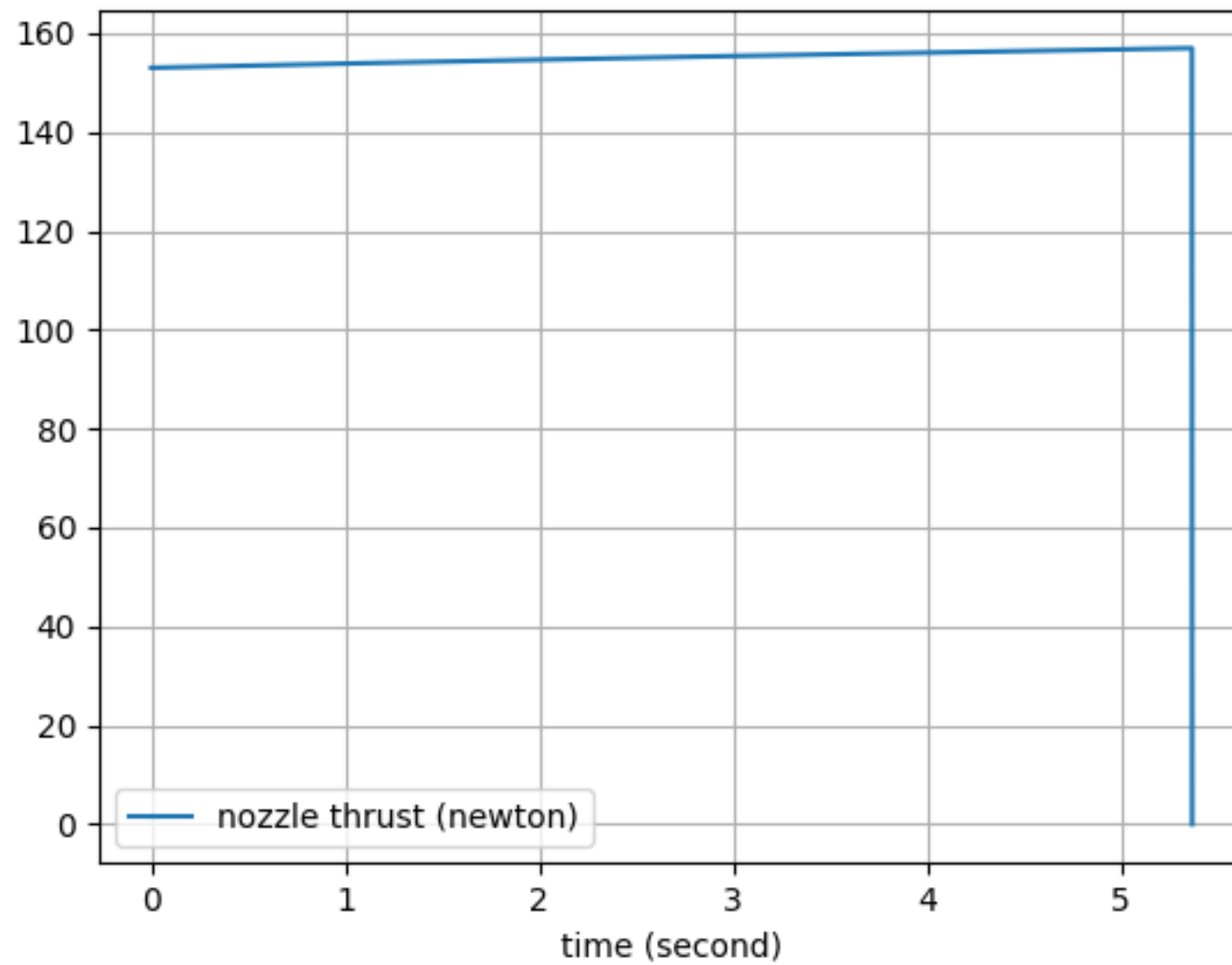
nozzle throat area (inch ** 2) vs time (second)



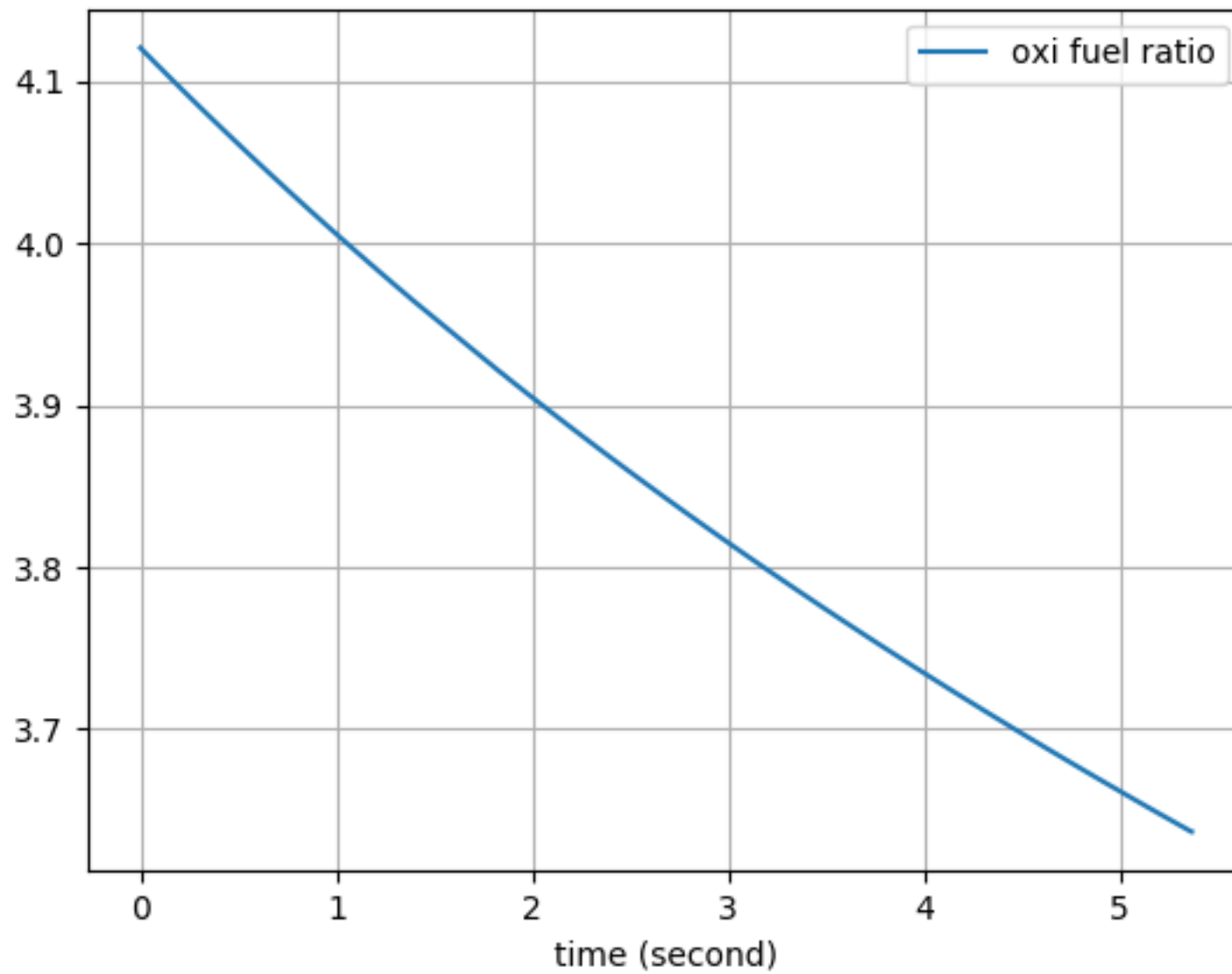
nozzle throat diameter (inch) vs time (second)



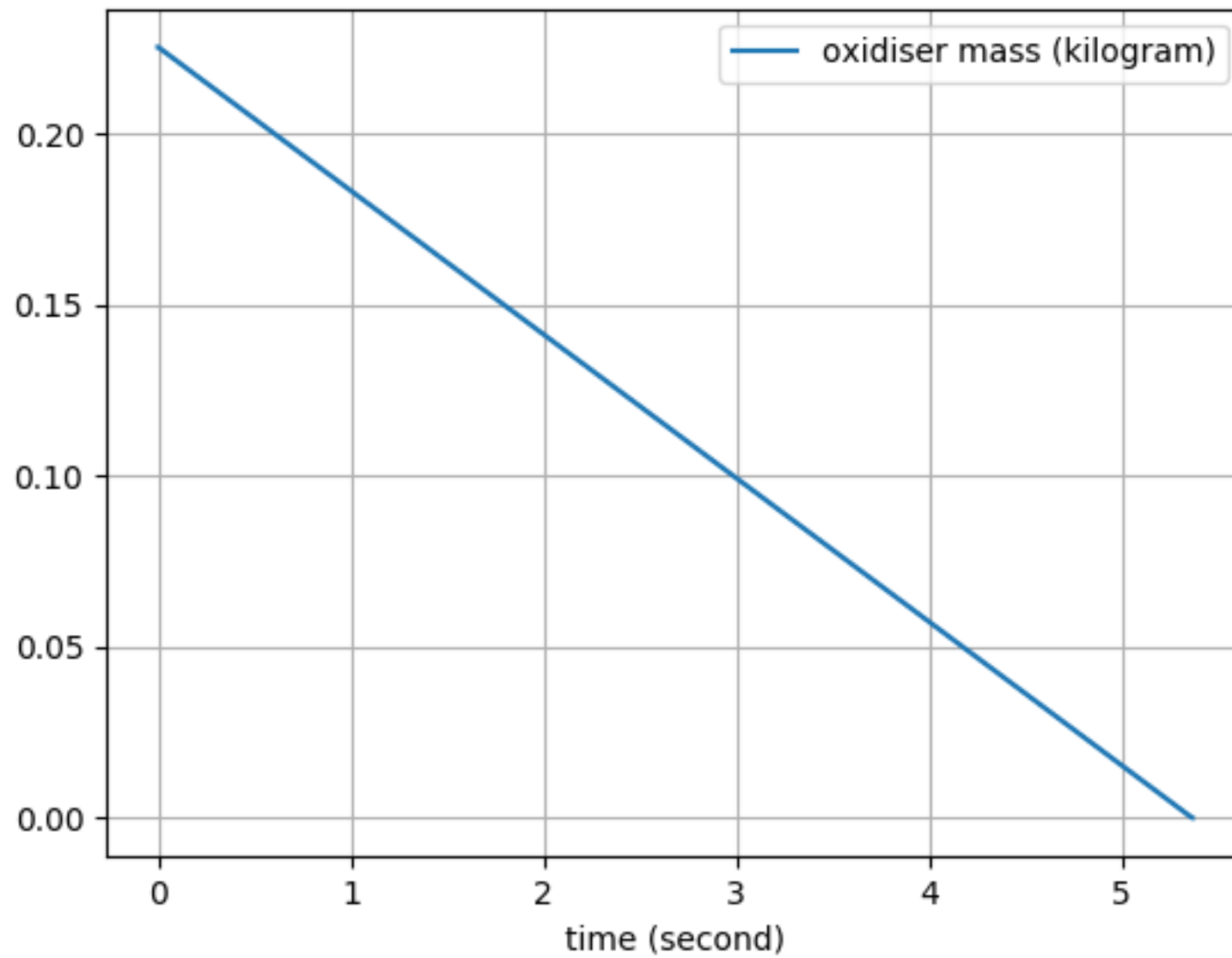
nozzle thrust (newton) vs time (second)



oxi fuel ratio vs time (second)



oxidiser mass (kilogram) vs time (second)



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

