

Ideal Nozzle Simulation Inputs:

a: 0.05 meter ** 2 / kilogram

n: 0.65

m: -0.2

Oxidiser:

Initial Volume: 0.41 liter

Initial Mass: 0.68 lbs

Injector Mass Flow Rate: 0.035 kilogram / second

Number of Injectors: 1

Ideal O/F Ratio: 4.83

External Temp: 70 degF

Time Step: 0.01 second

Simulation Results:

Total Burn Time: 8.73 second

Impulse: 1160.78 newton * second

Average Thrust: 132.96 newton

Motor: J133

Nozzle Results:

Suggested Throat Diameter: 0.193 inch

Suggested Exit Diameter: 0.438 inch

Suggested Diffuser Length: 0.457 inch

Fuel Grain

Port Length: 13.4 inch

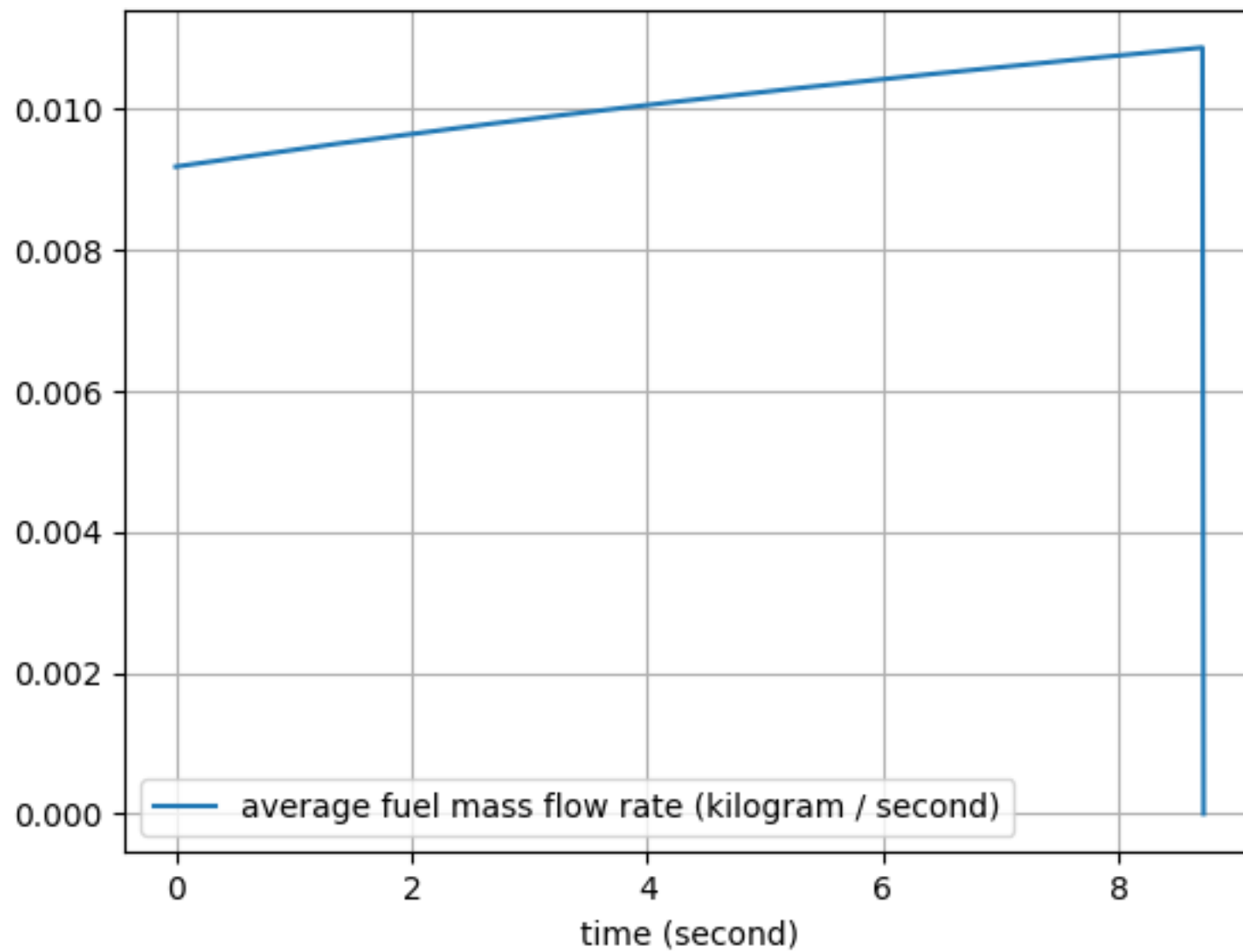
Fuel Density: 3.96 kilogram / meter ** 3

Grain Diameter: 1.75 inch

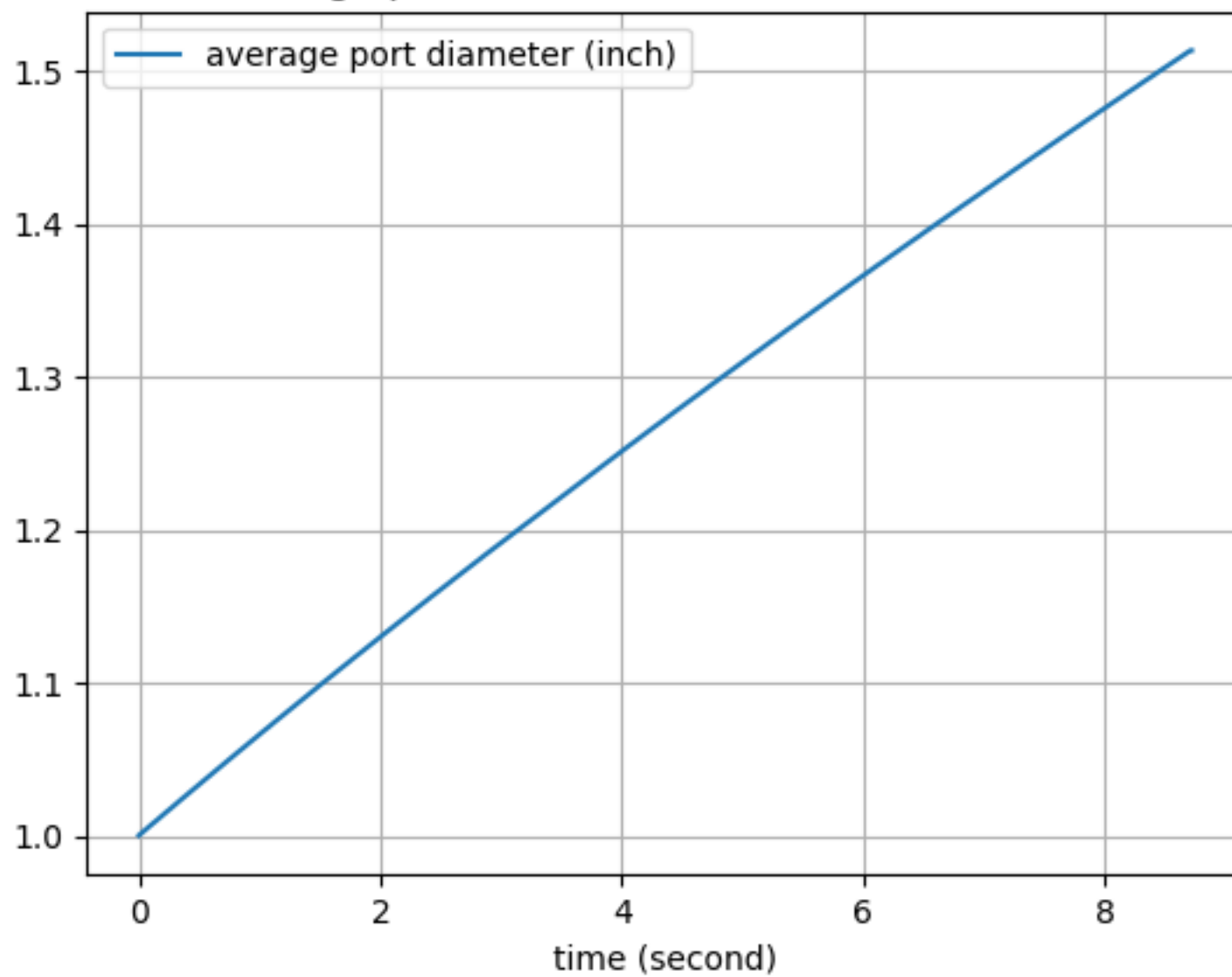
Initial Port Diameter: 1.0 inch

Final Port Diameter: 1.513 inch

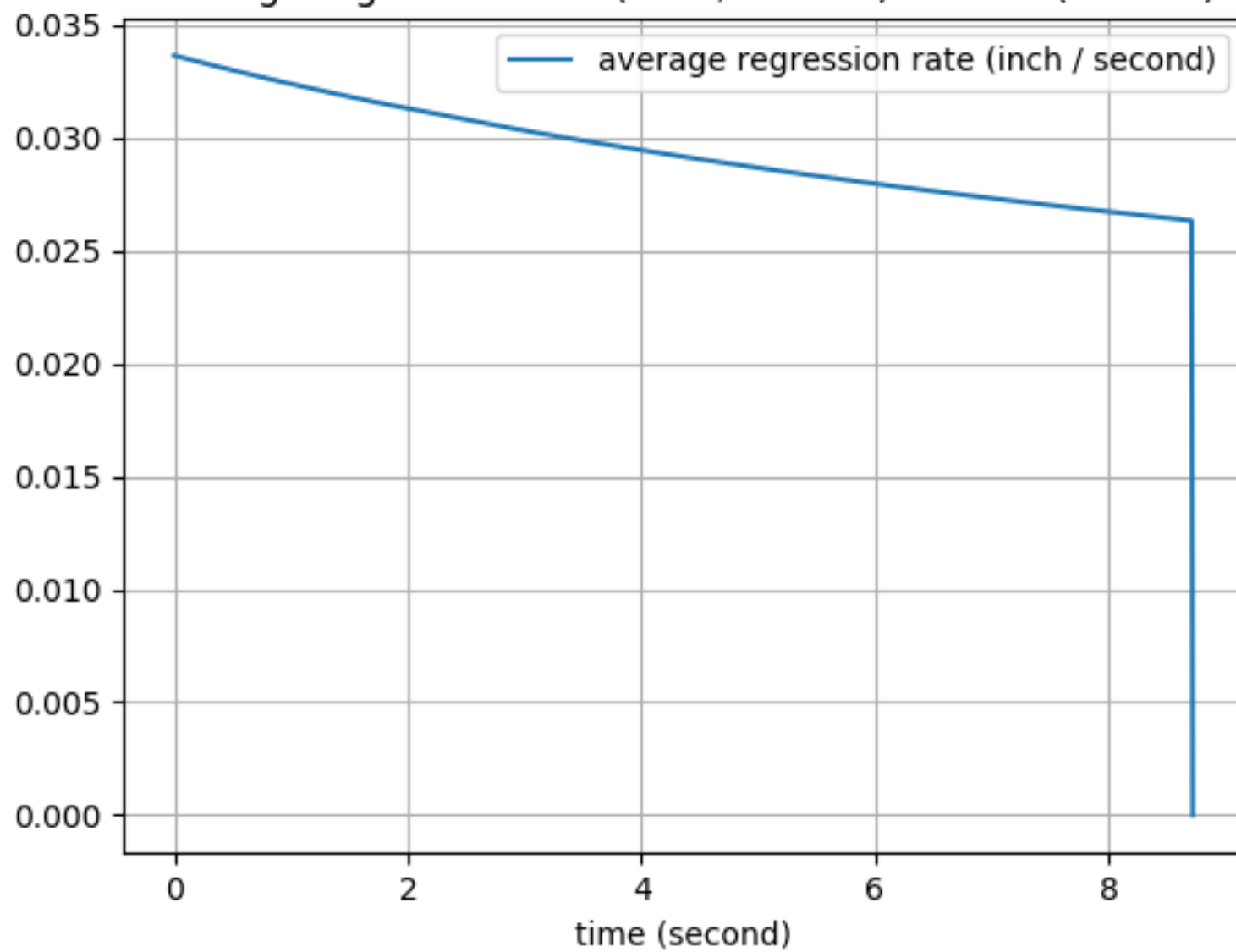
average fuel mass flow rate (kilogram / second) vs time (second)



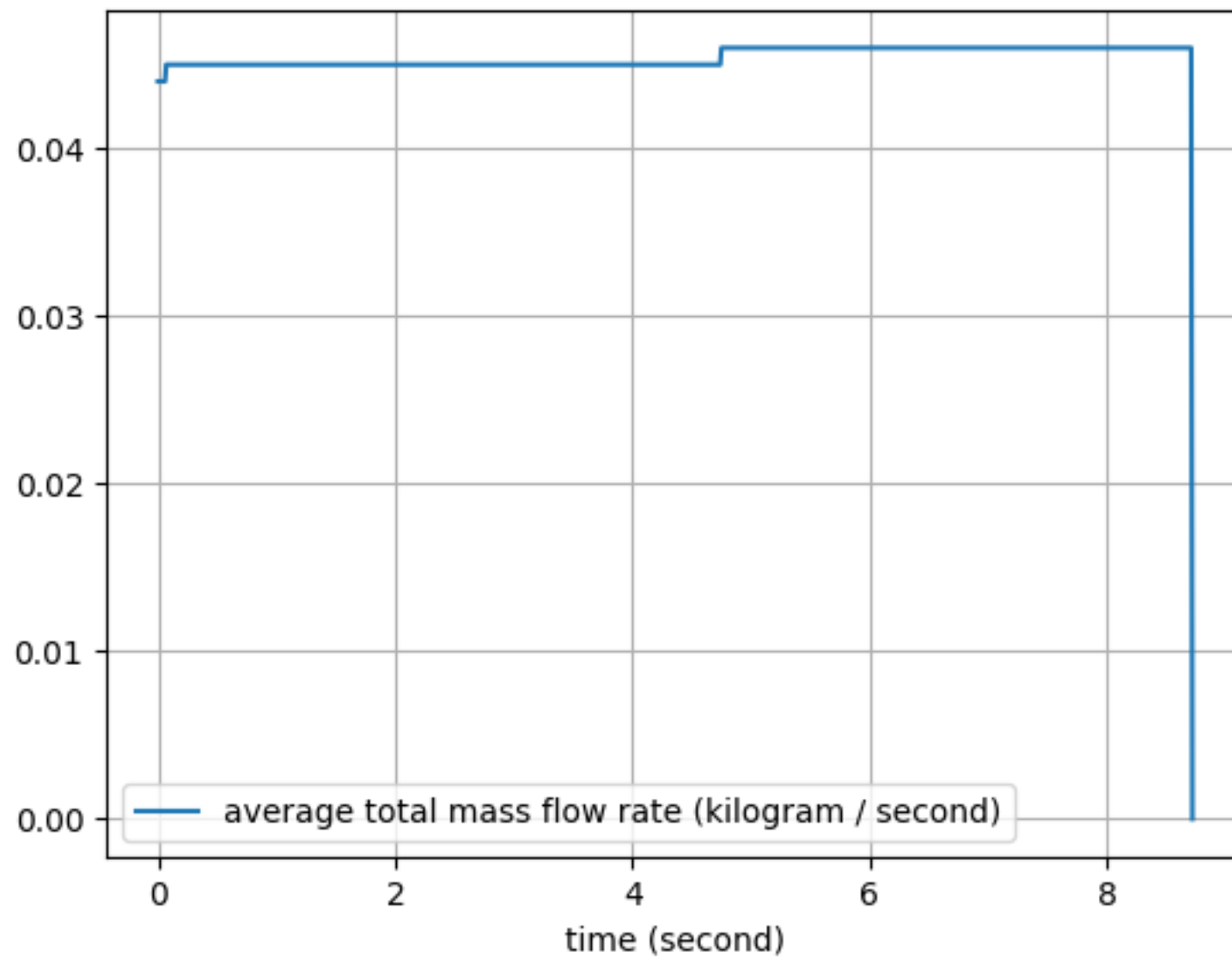
average port diameter (inch) vs time (second)



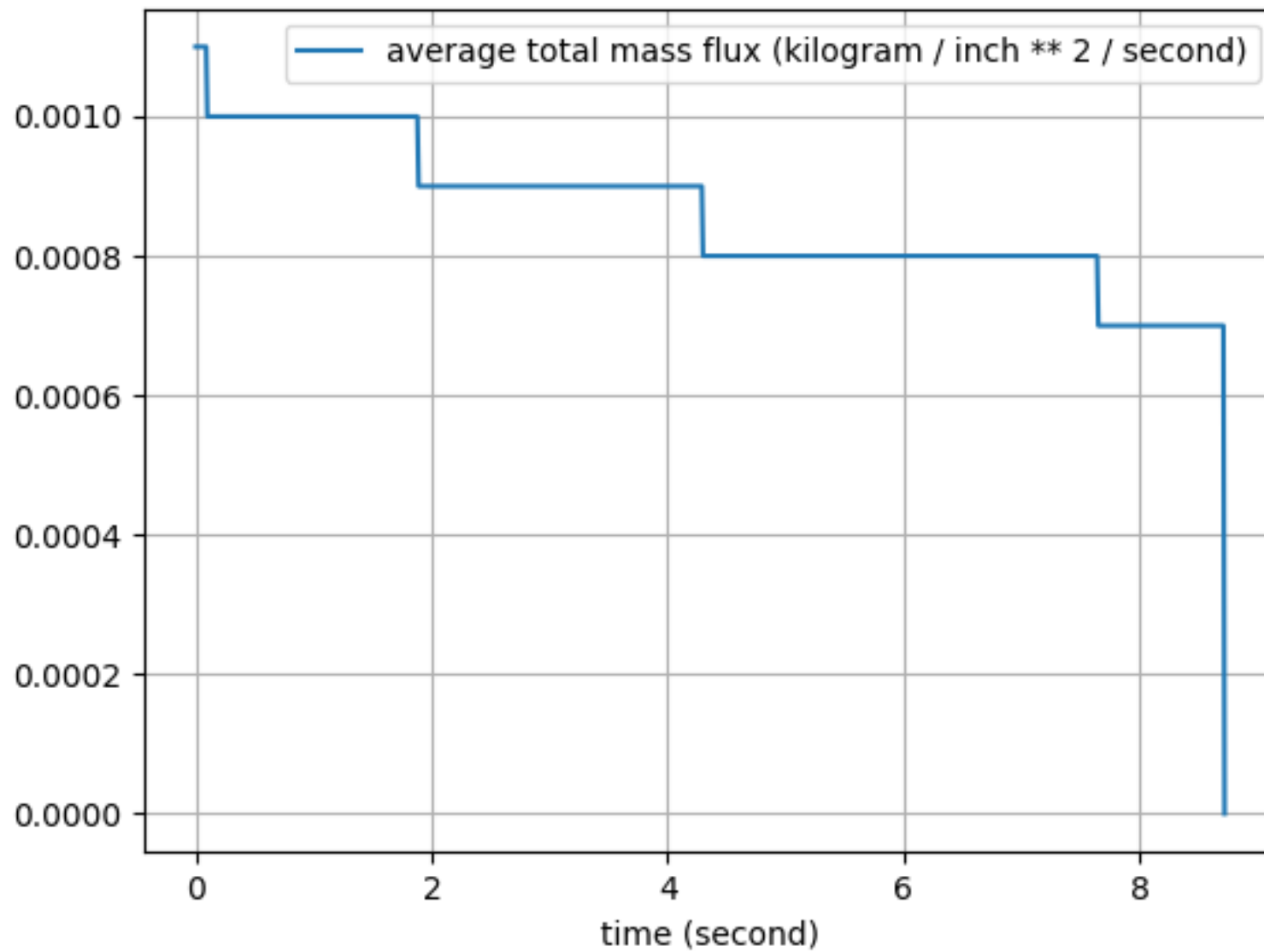
average regression rate (inch / second) vs time (second)



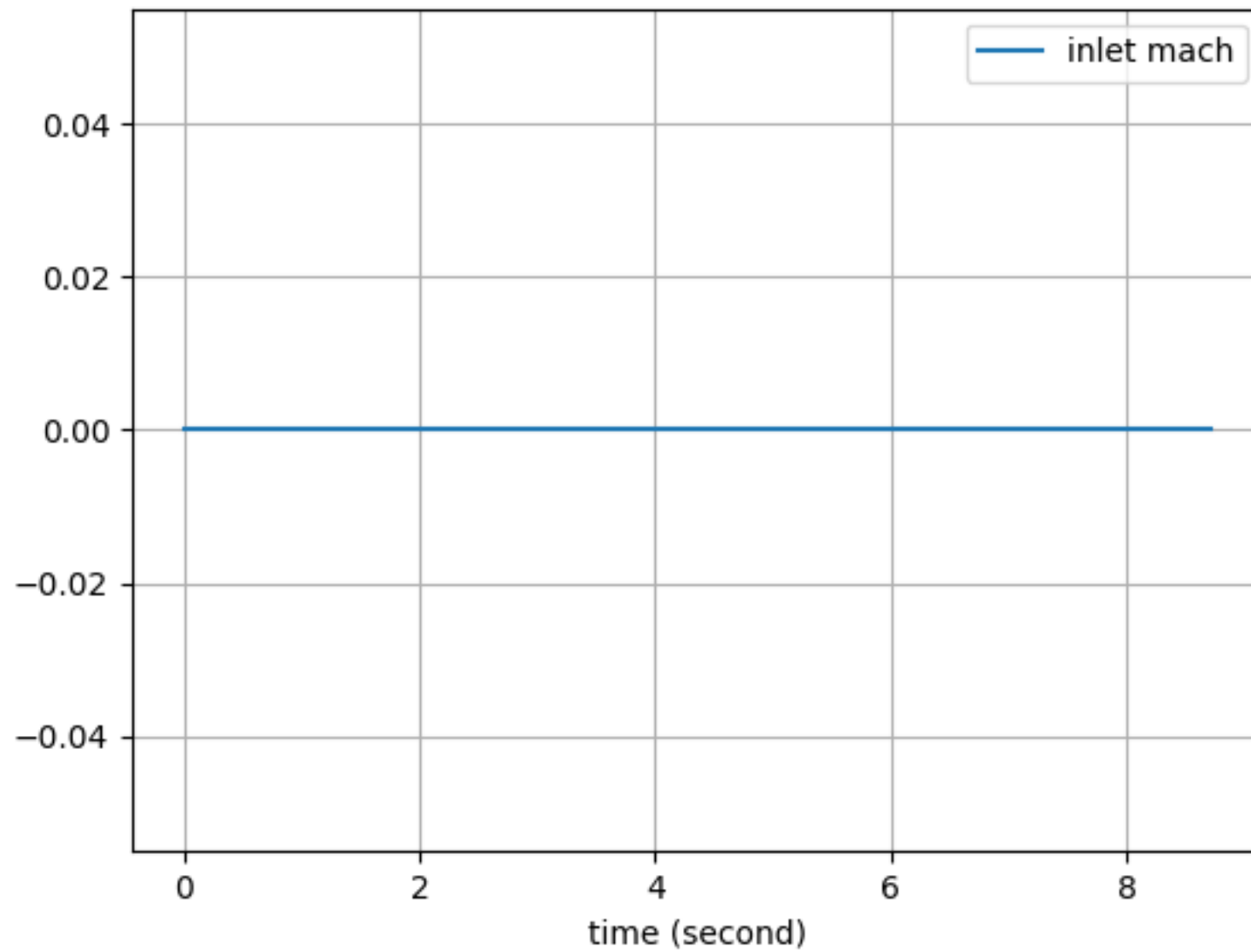
average total mass flow rate (kilogram / second) vs time (second)



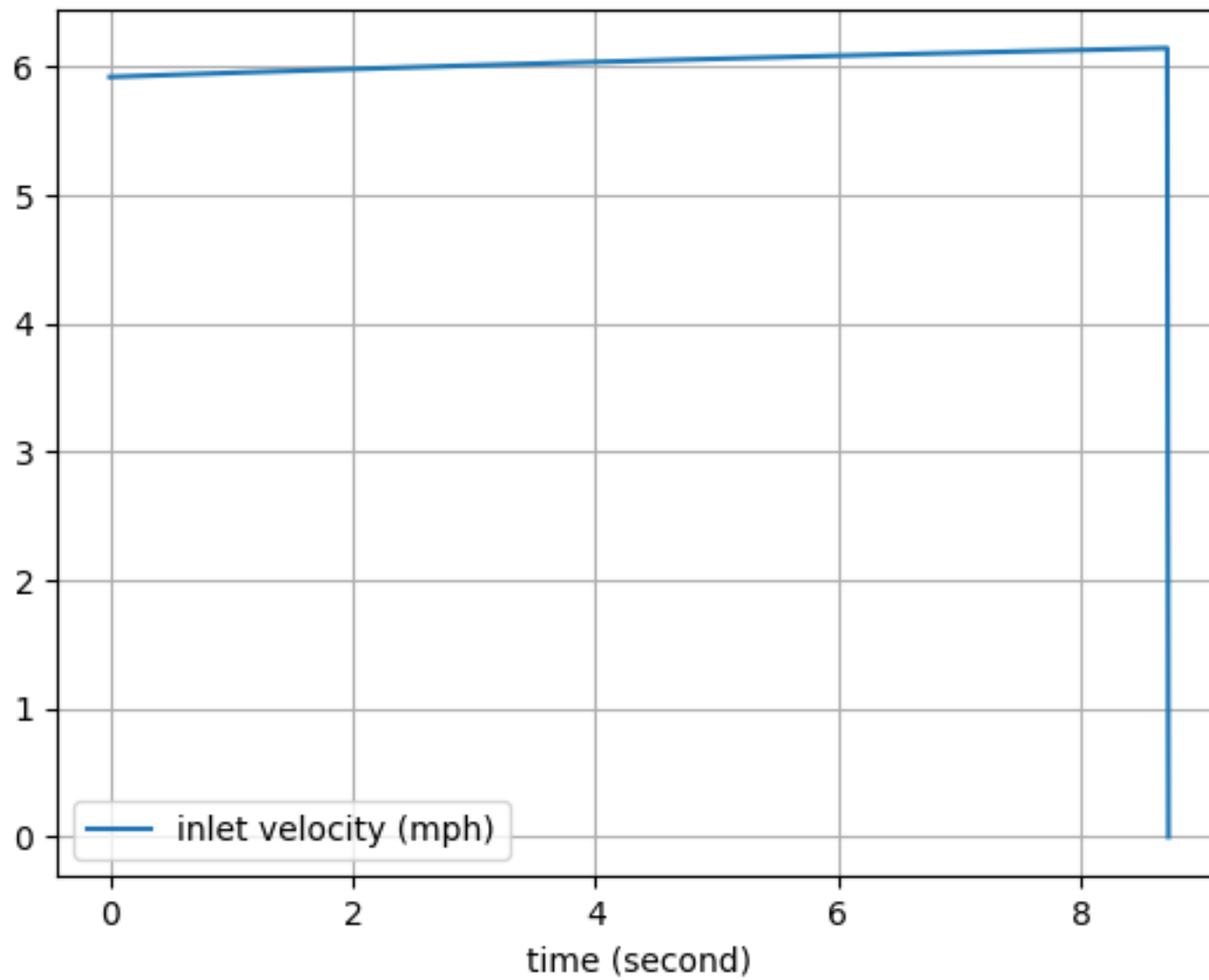
average total mass flux (kilogram / inch ** 2 / second) vs time (second)

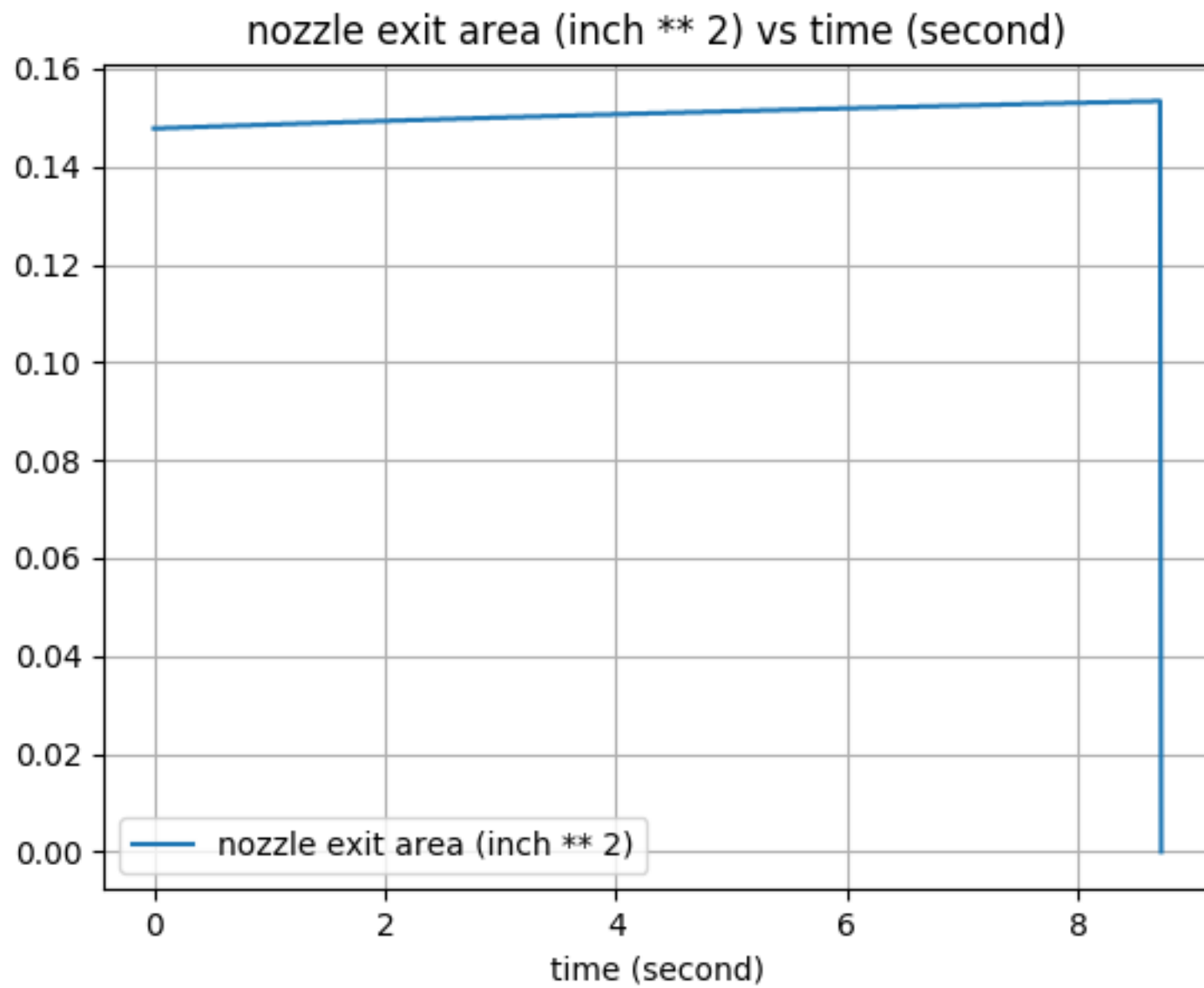


inlet mach vs time (second)

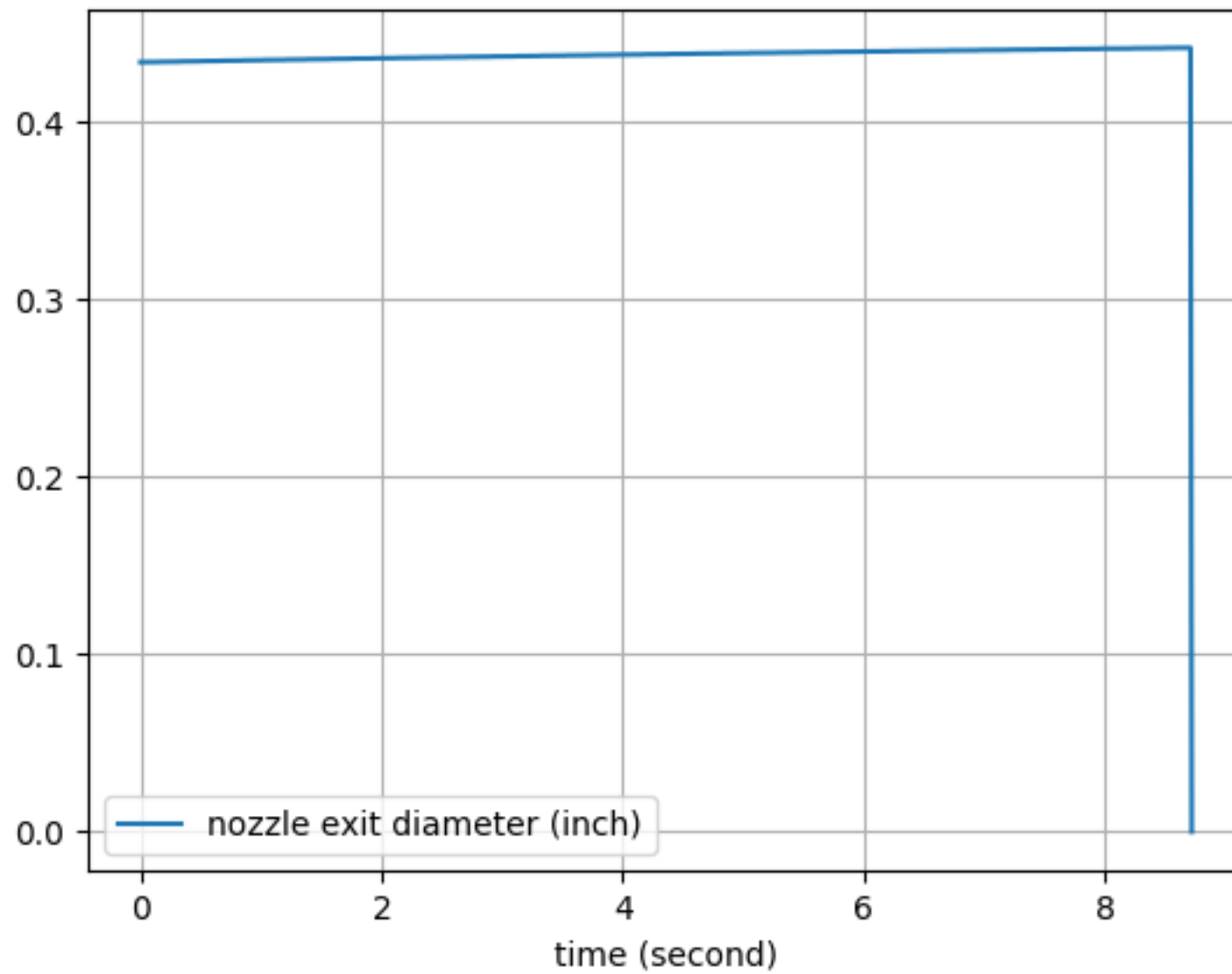


inlet velocity (mph) vs time (second)

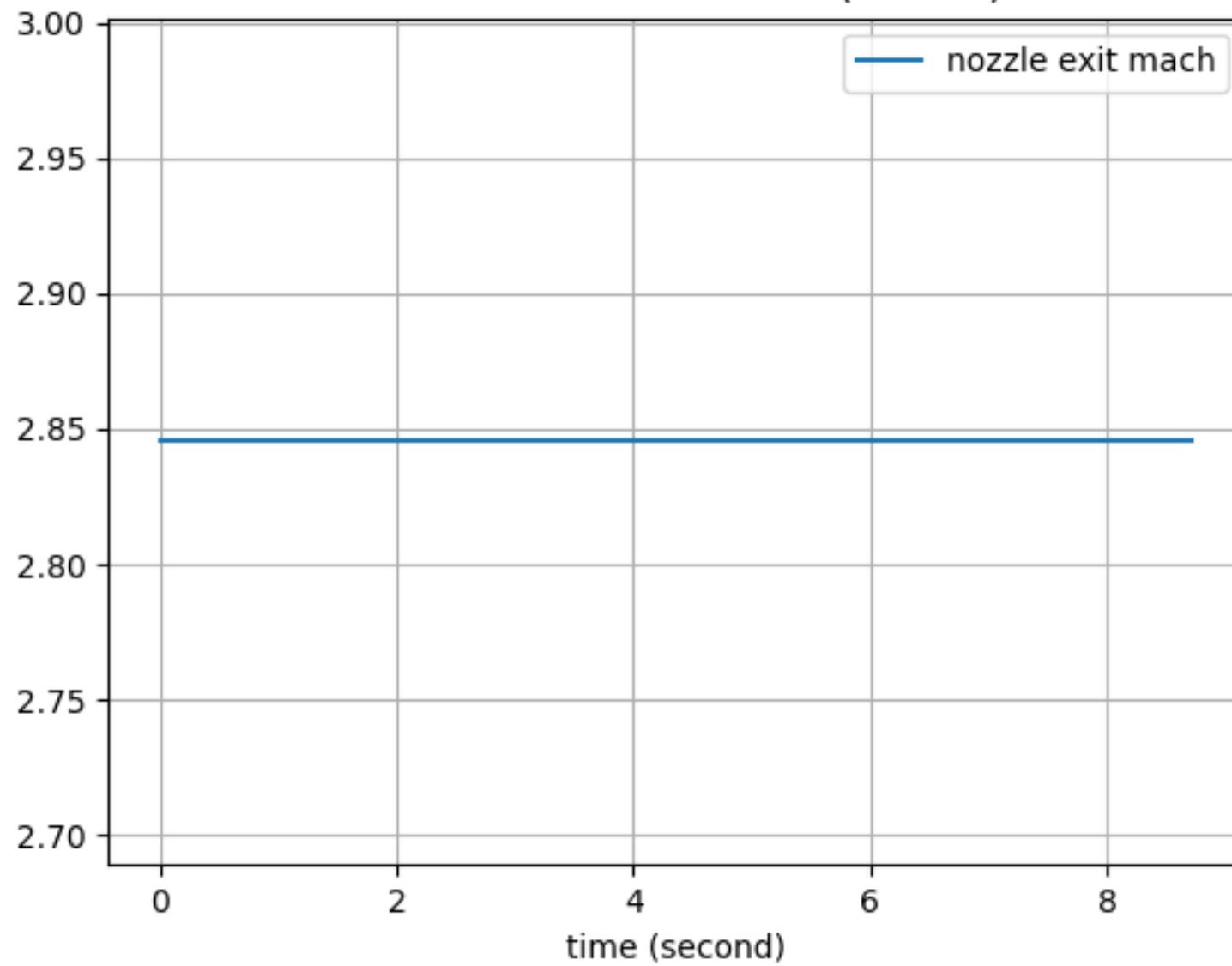




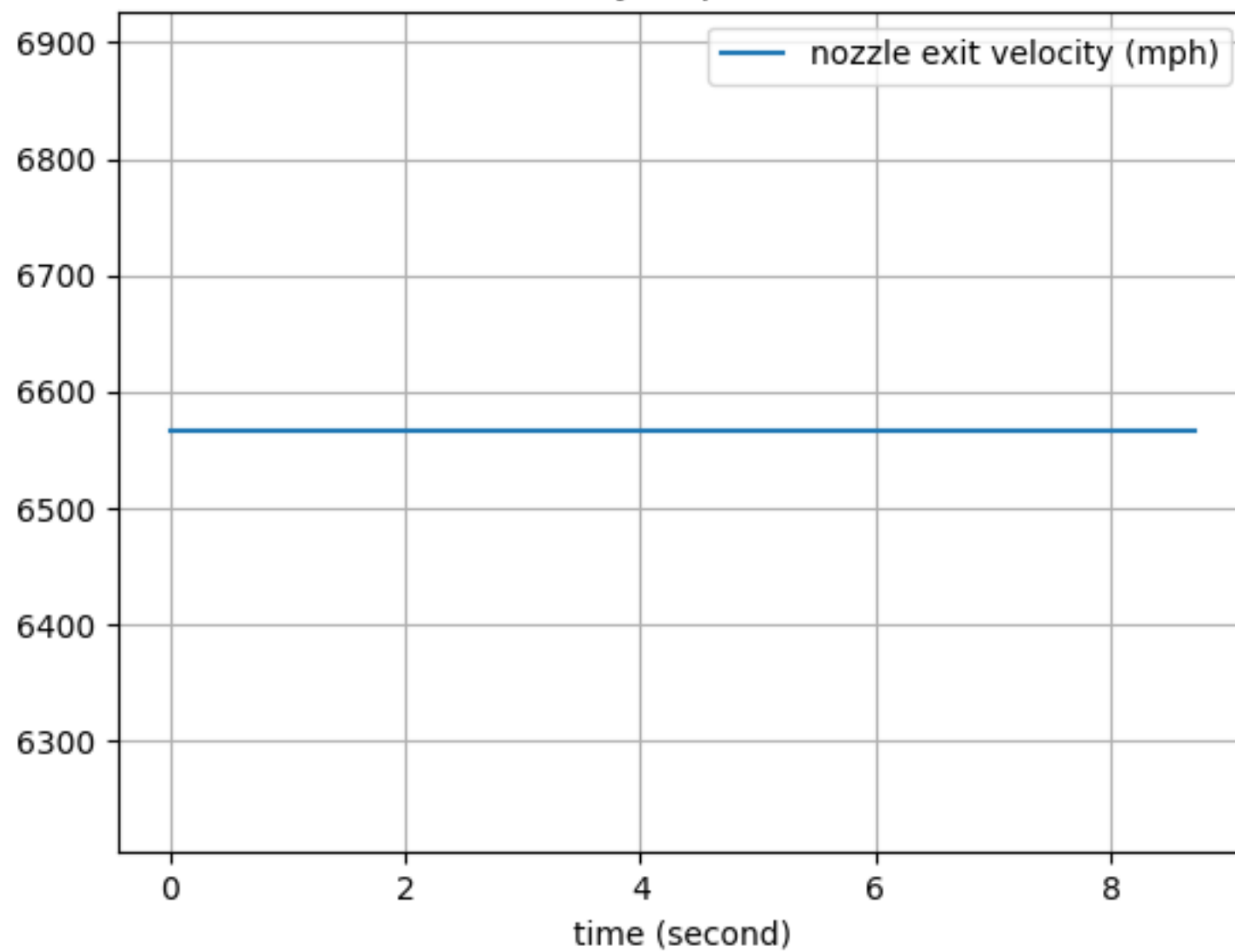
nozzle exit diameter (inch) vs time (second)

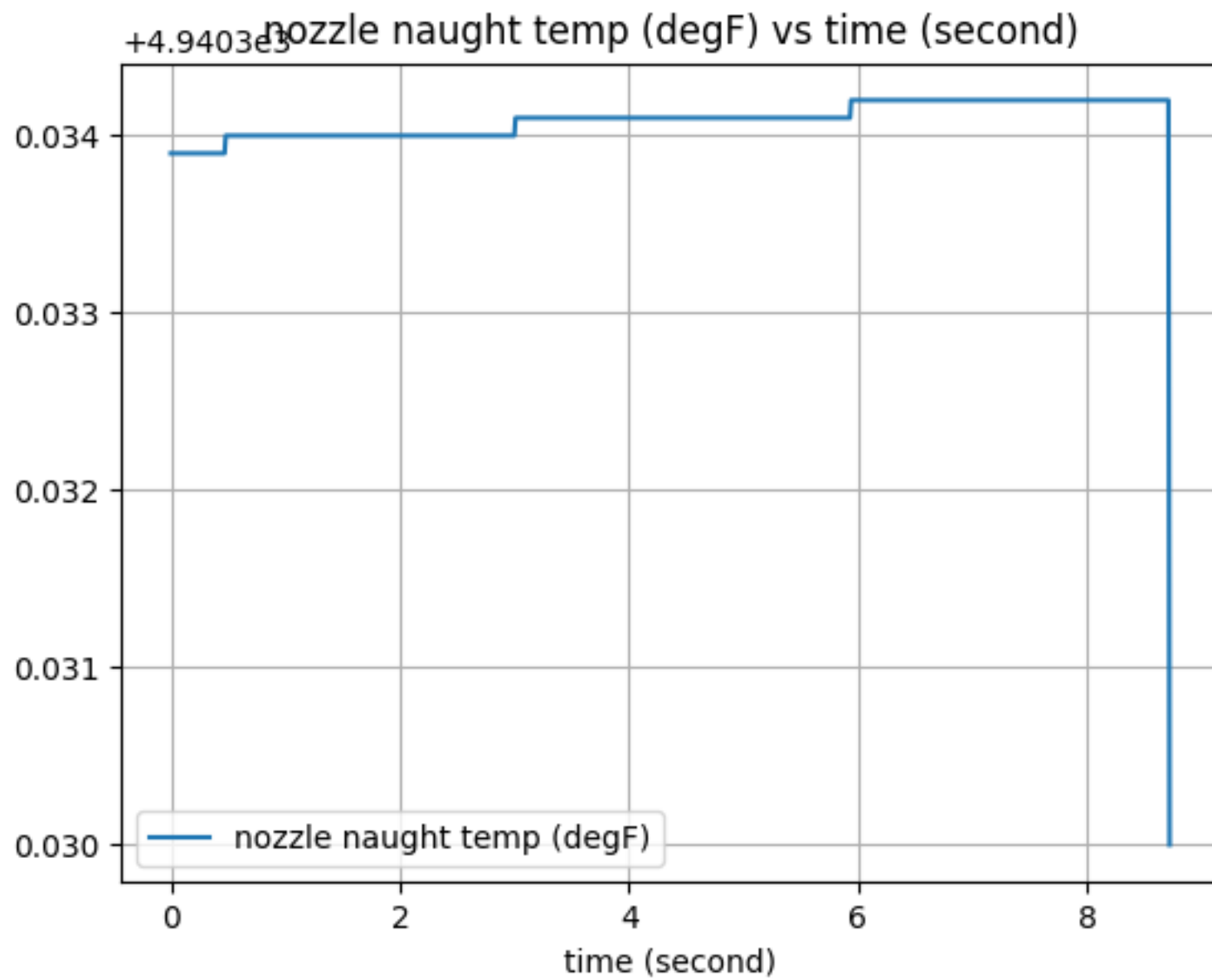


nozzle exit mach vs time (second)

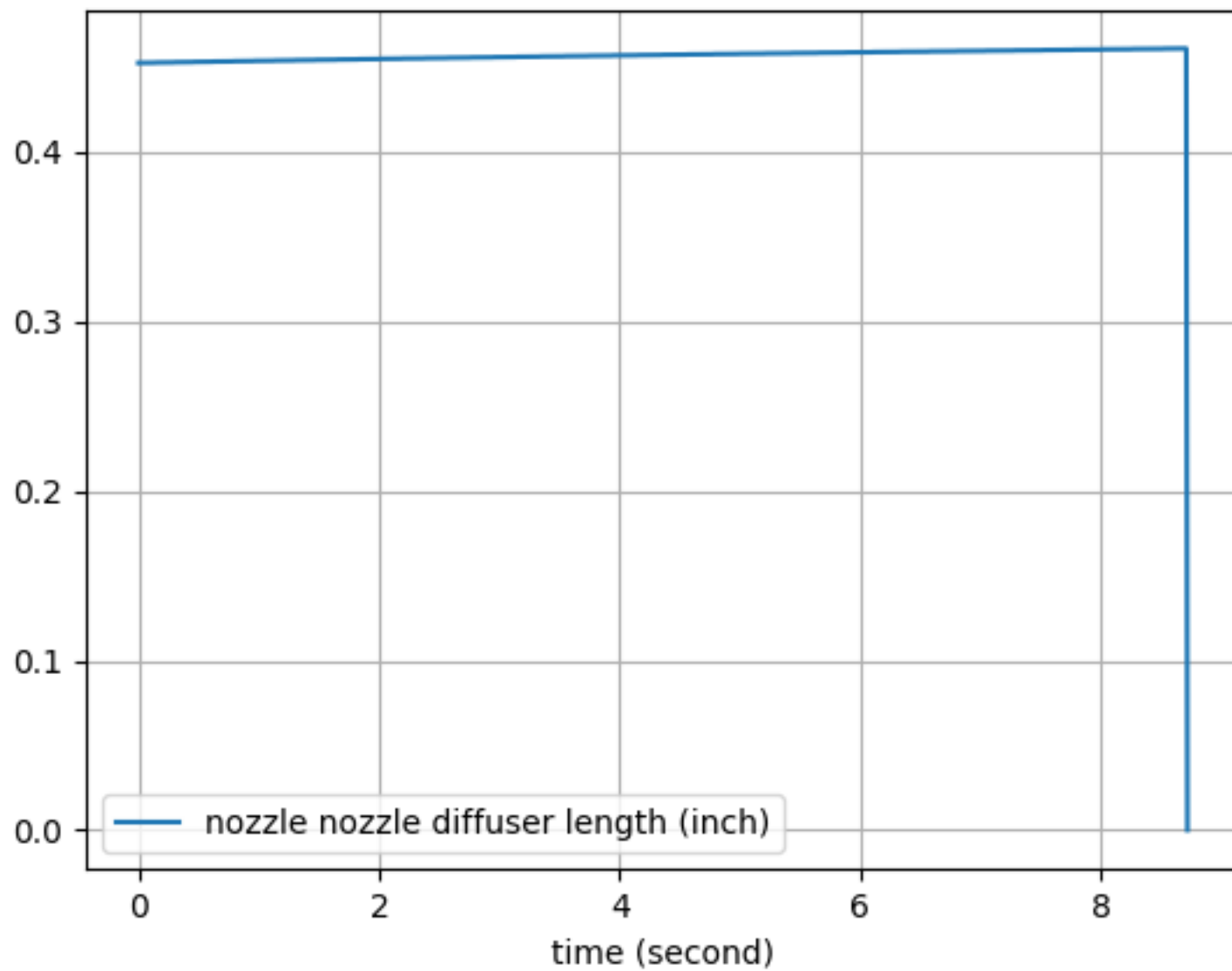


nozzle exit velocity (mph) vs time (second)

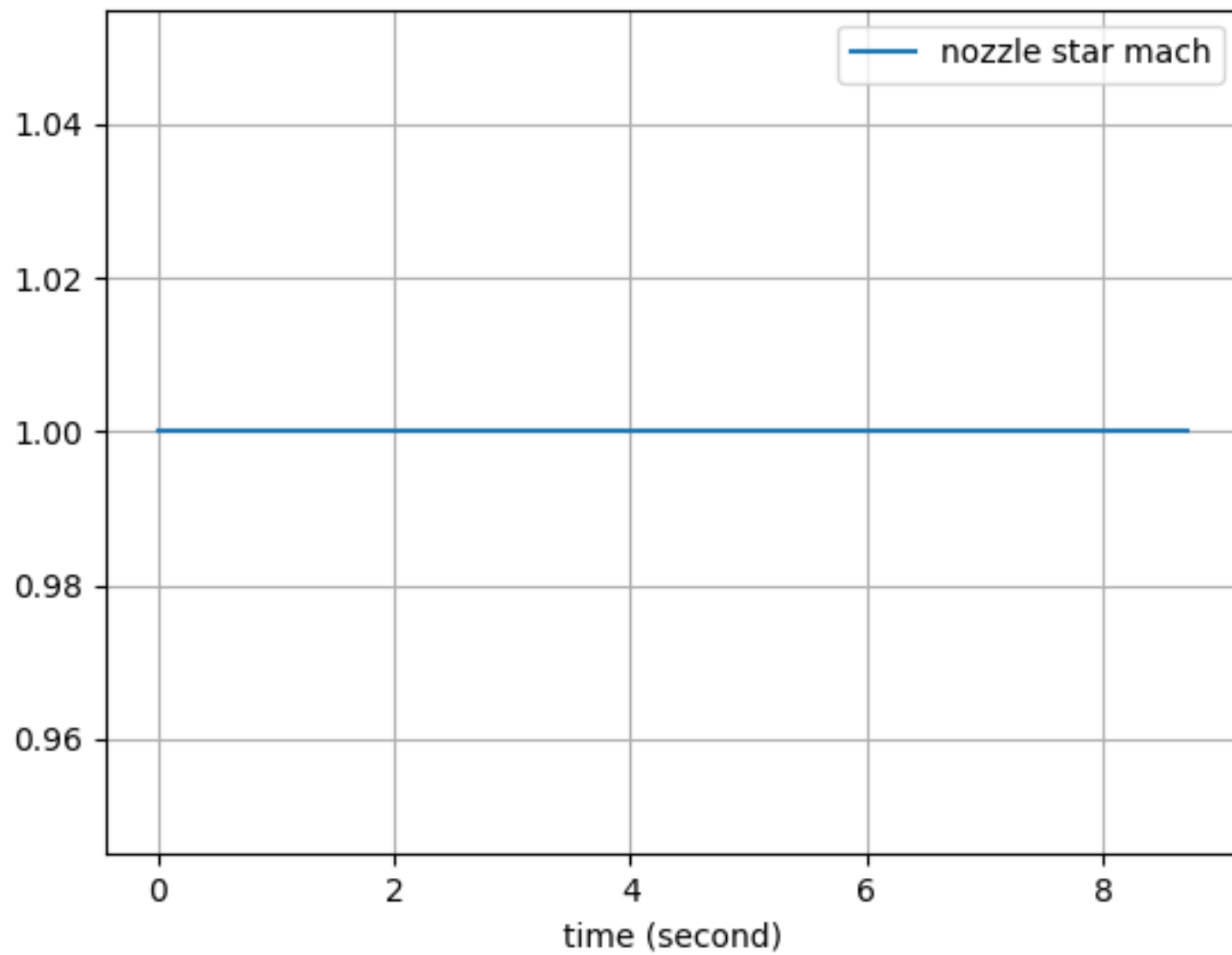




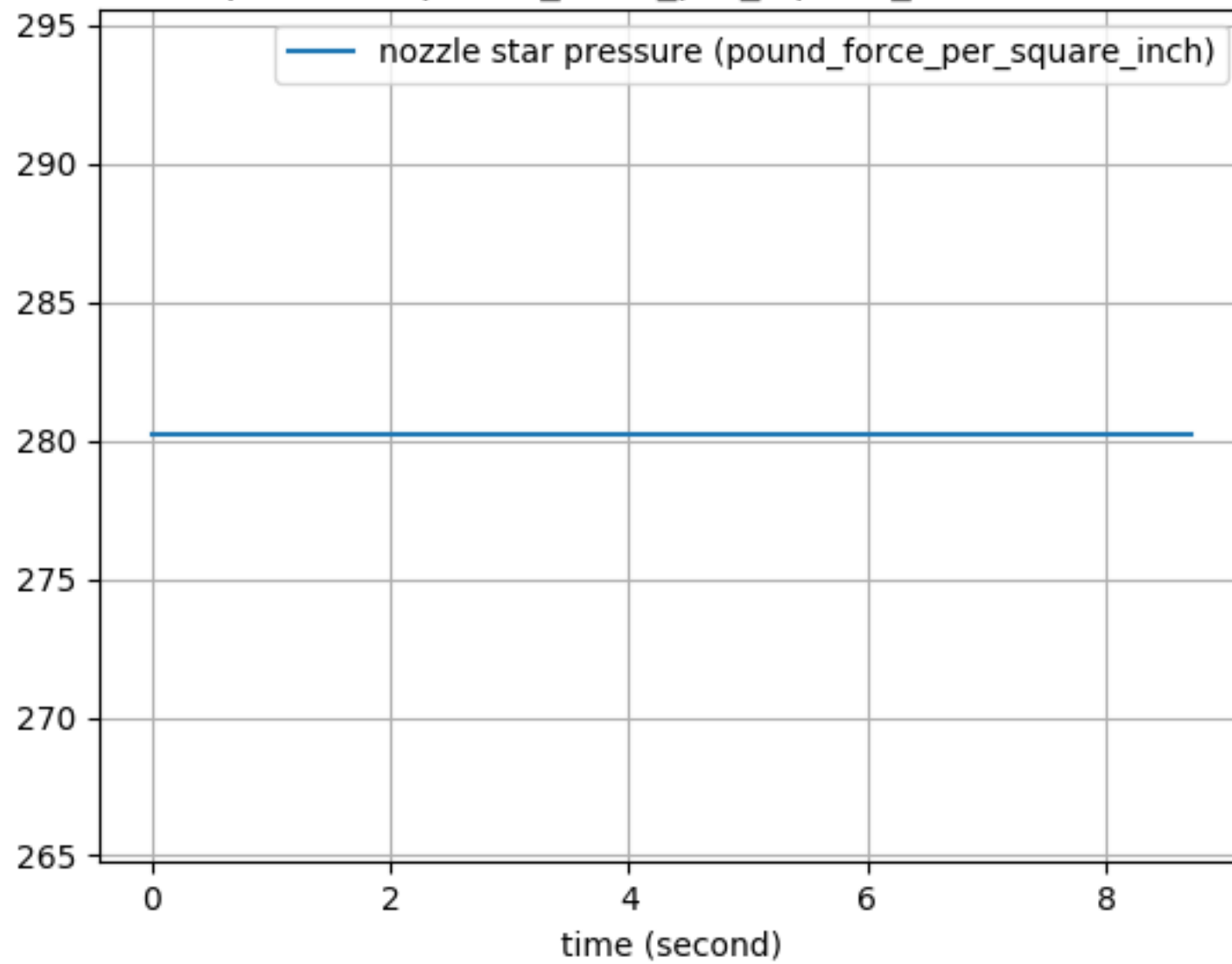
nozzle nozzle diffuser length (inch) vs time (second)



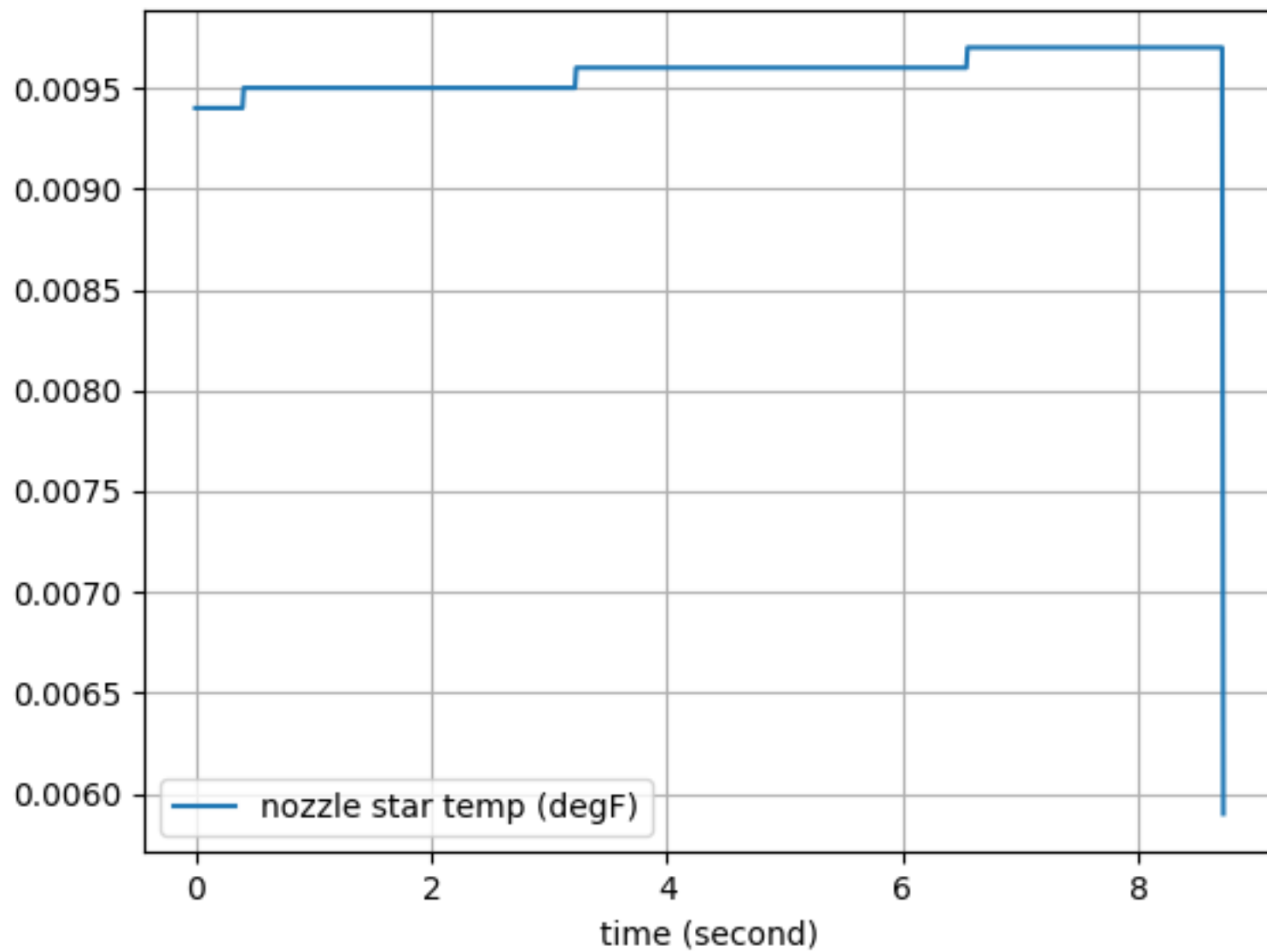
nozzle star mach vs time (second)



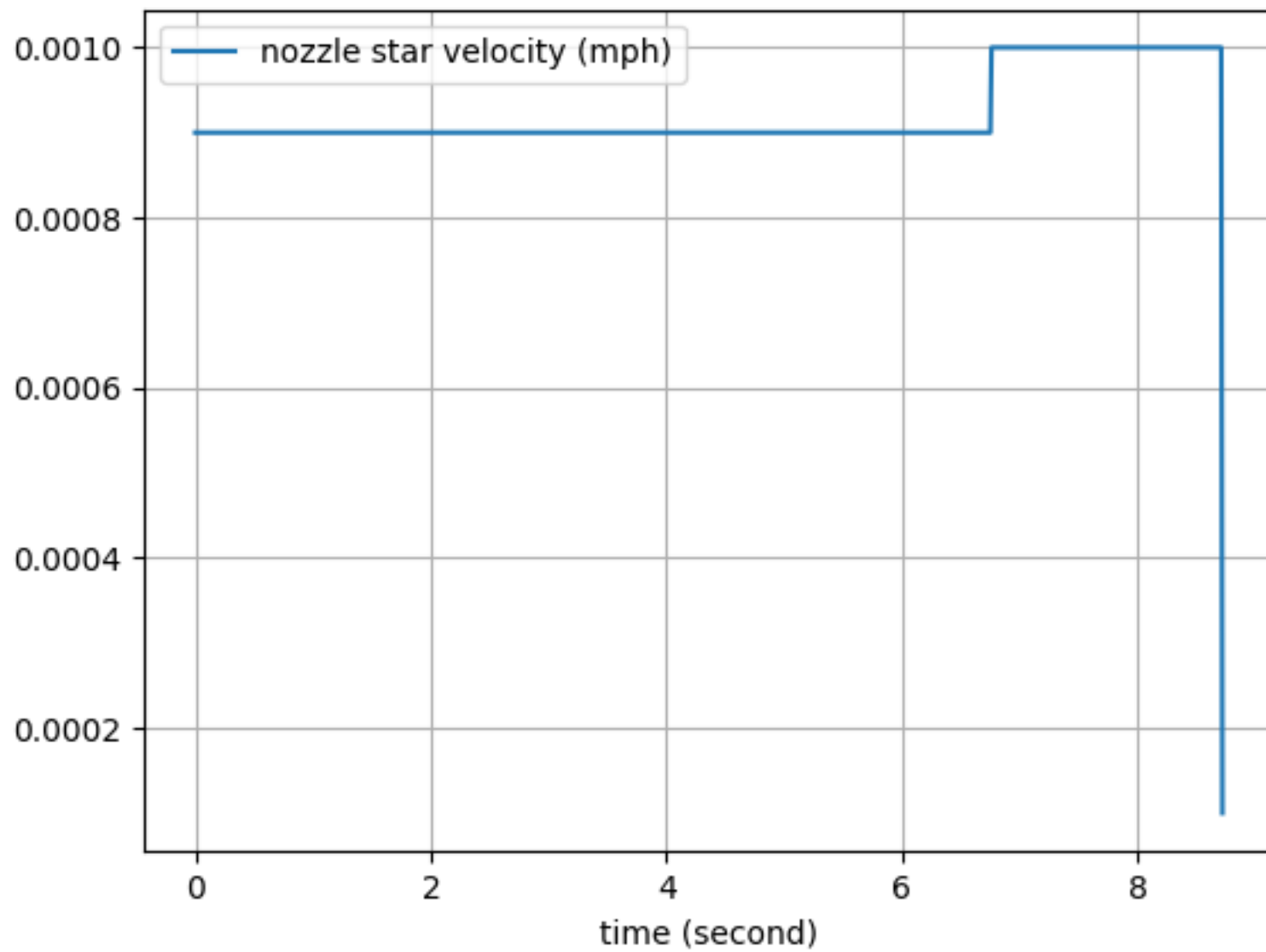
nozzle star pressure (pound_force_per_square_inch) vs time (second)



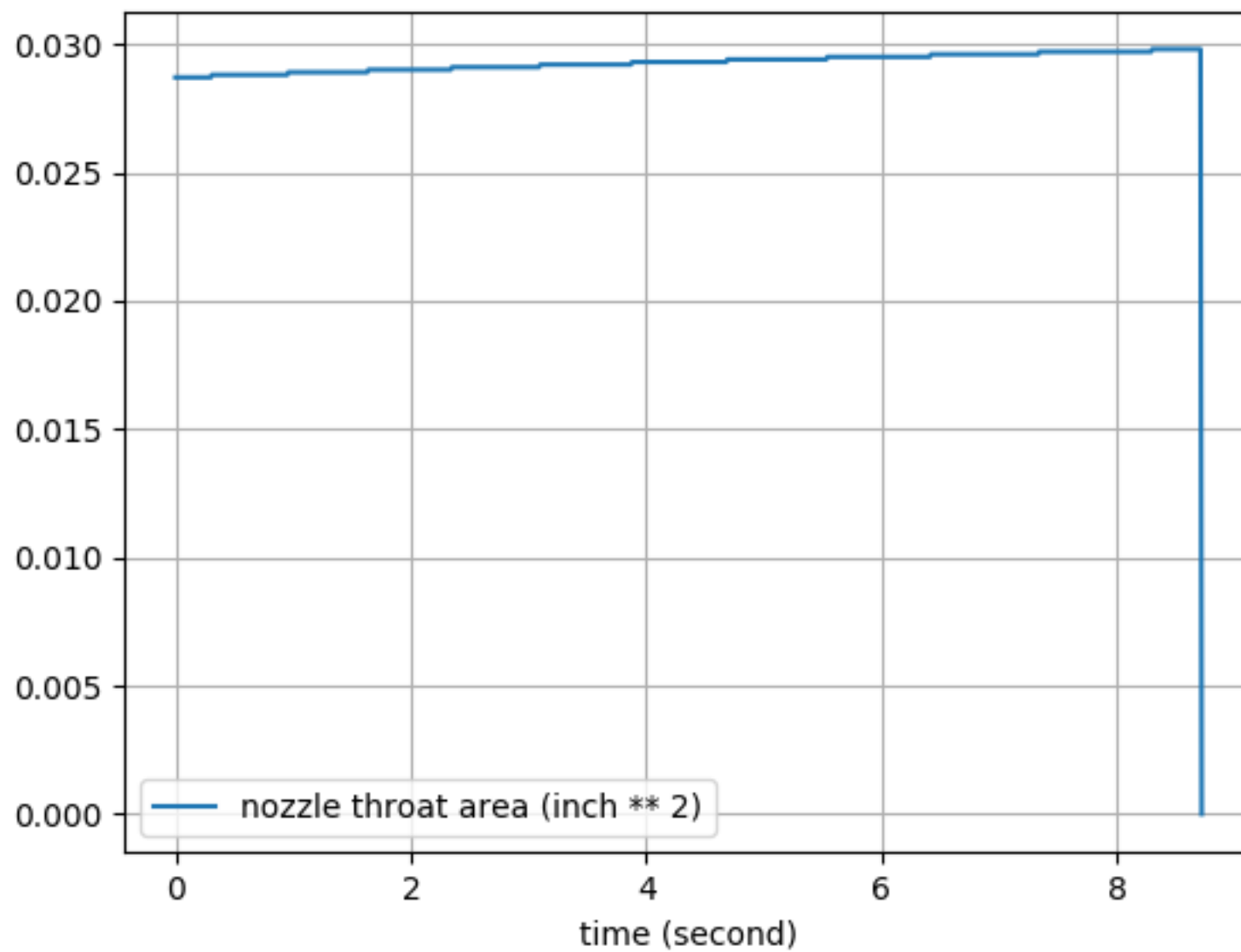
nozzle star temp (degF) vs time (second)



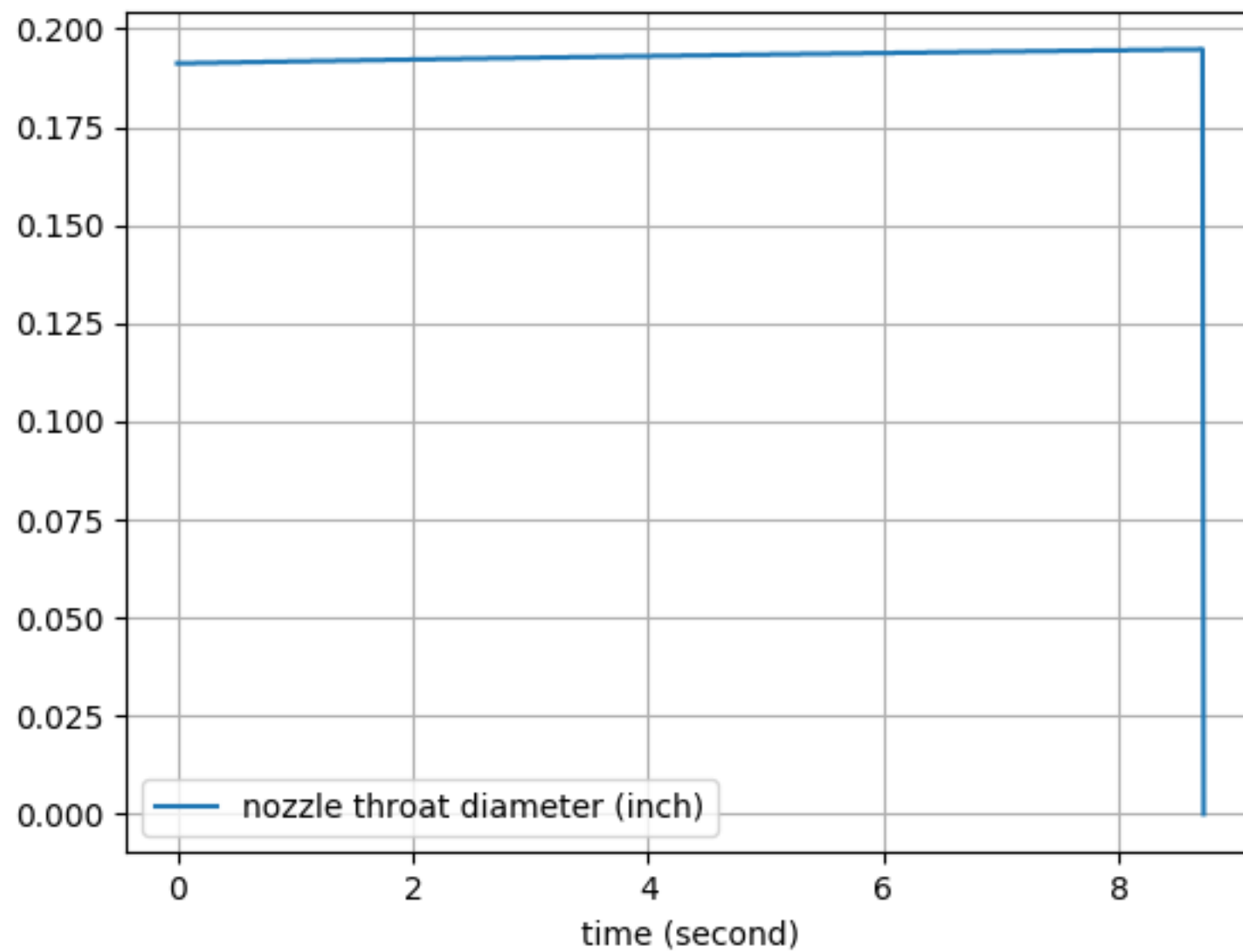
nozzle star velocity (mph) vs time (second)



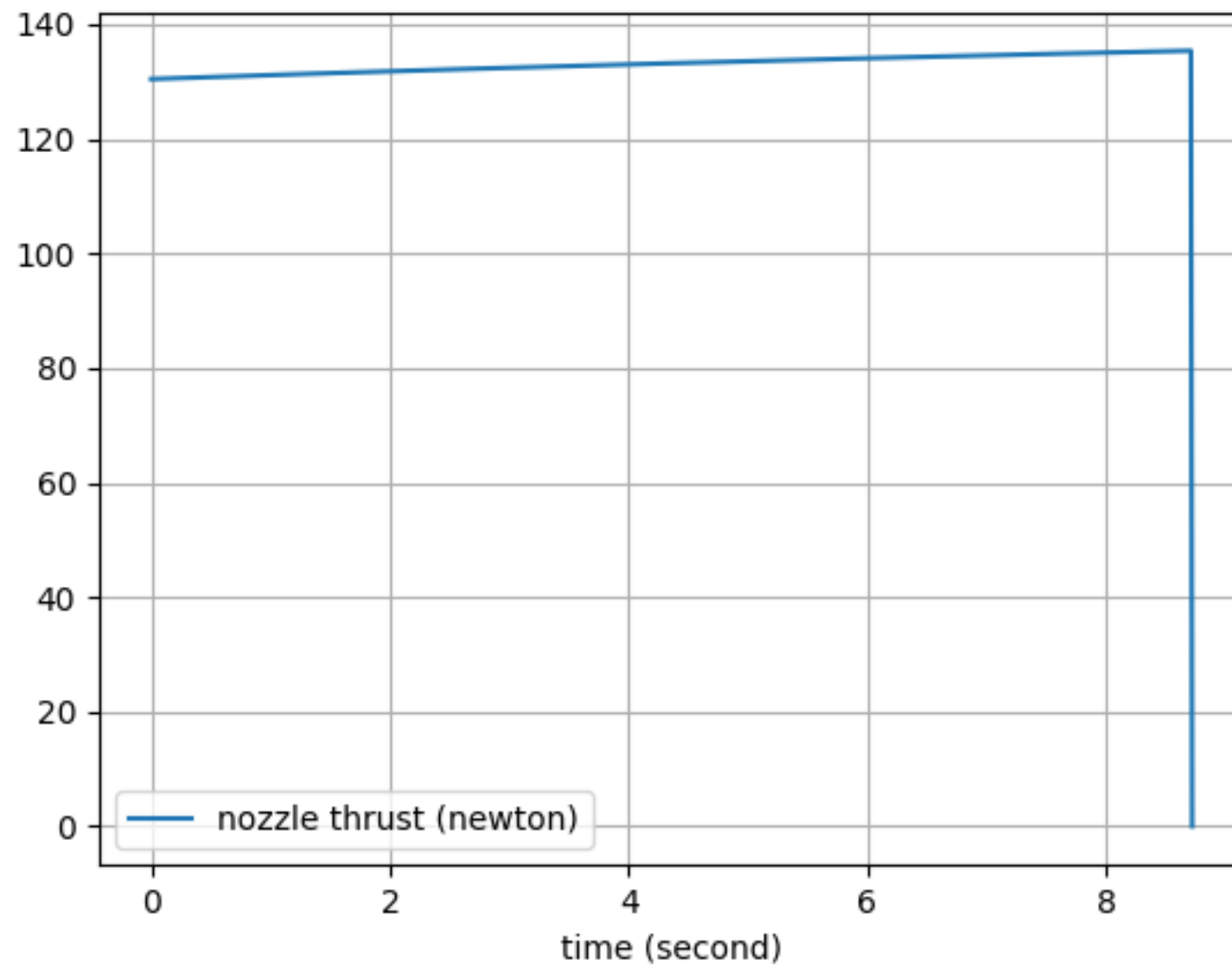
nozzle throat area (inch ** 2) vs time (second)



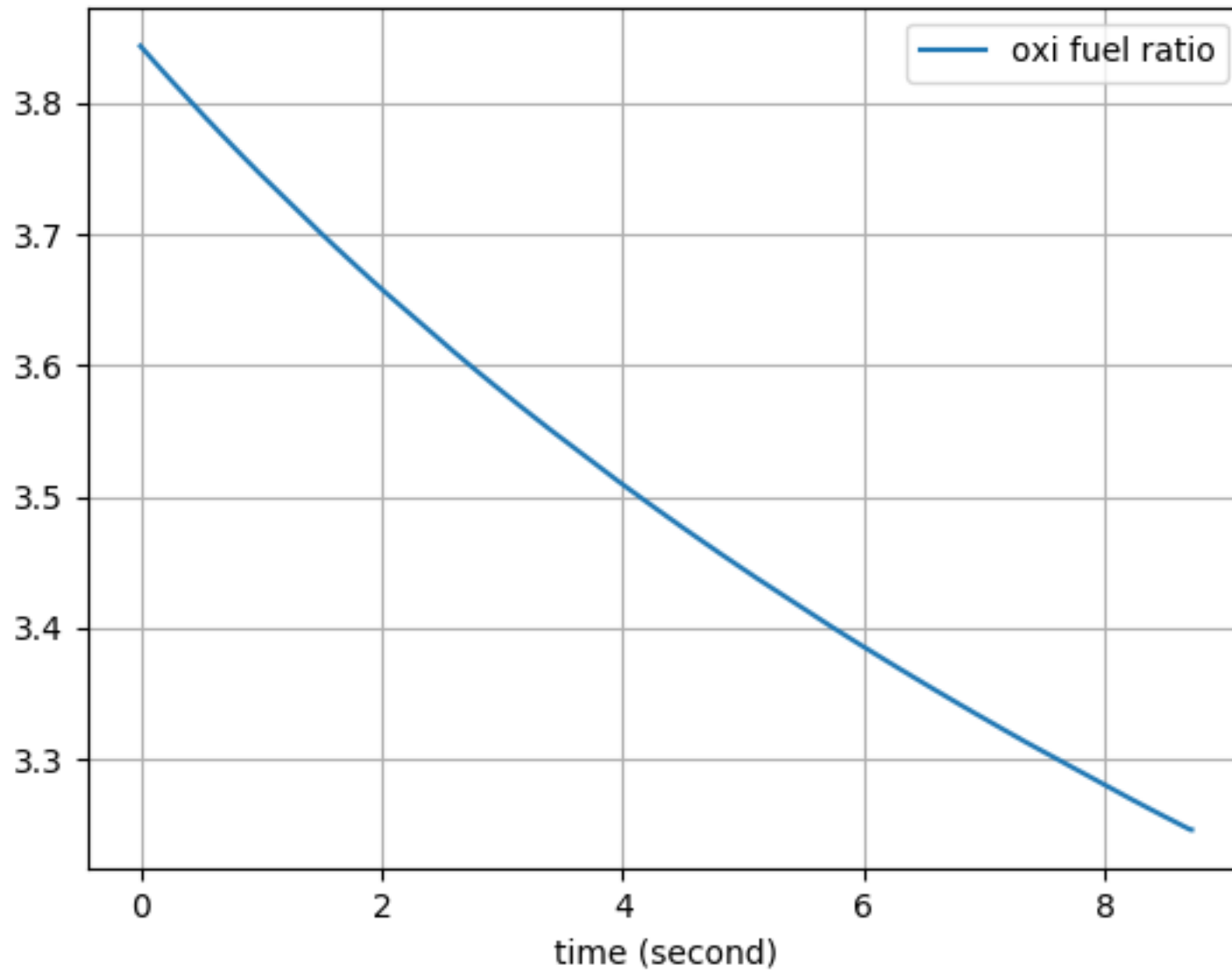
nozzle throat diameter (inch) vs time (second)



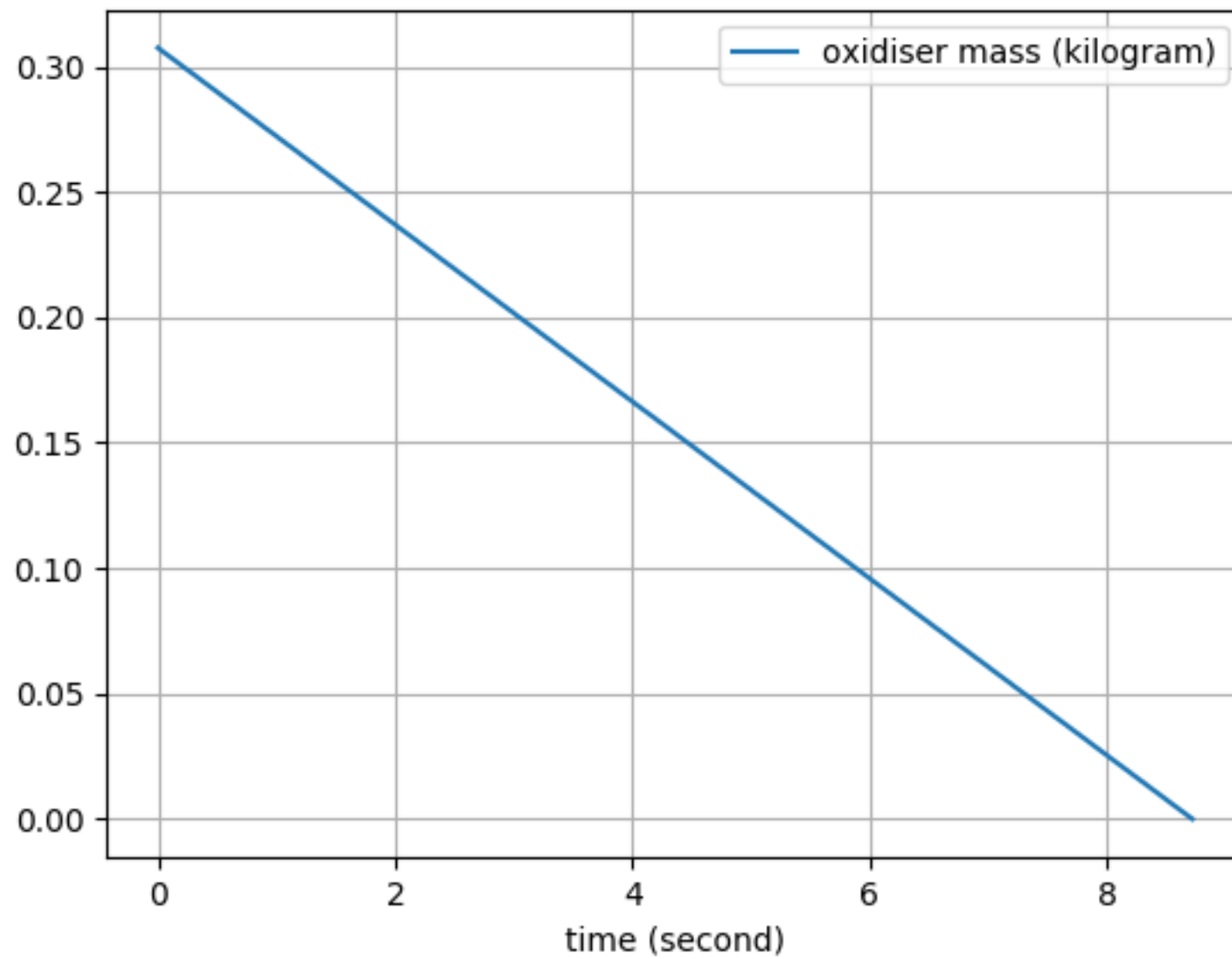
nozzle thrust (newton) vs time (second)



oxi fuel ratio vs time (second)



oxidiser mass (kilogram) vs time (second)



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

