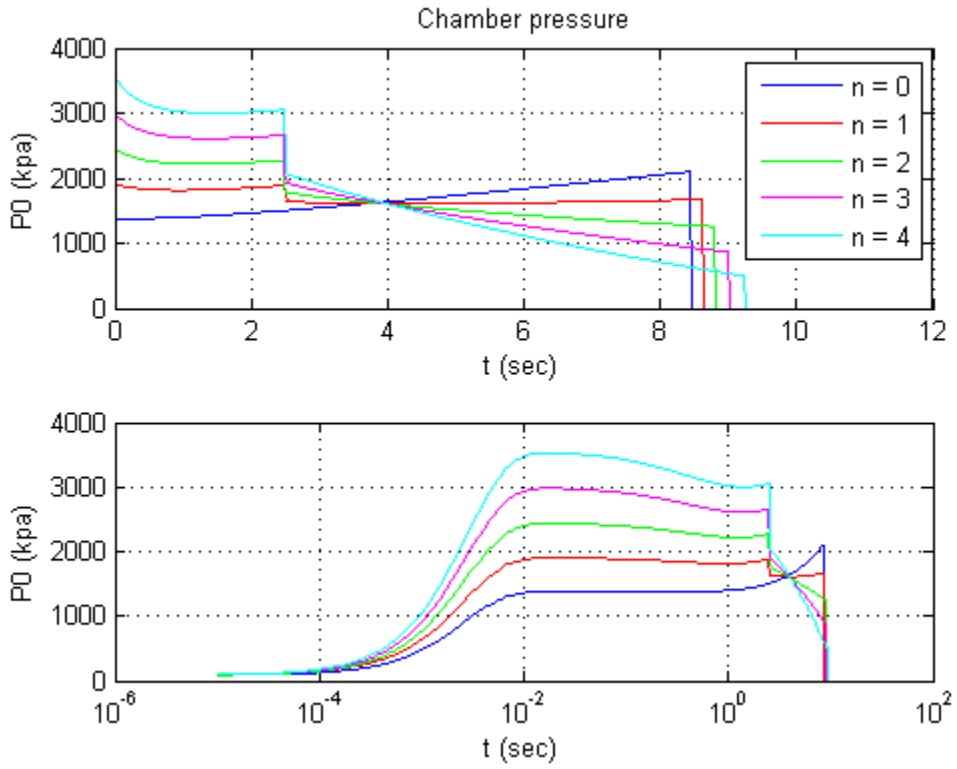
Plot and compare parameters for 0,1,2,3,4 grain fracture/s

Use initial ambient pressure of 86000Pa (From MAE 5540 project 2)

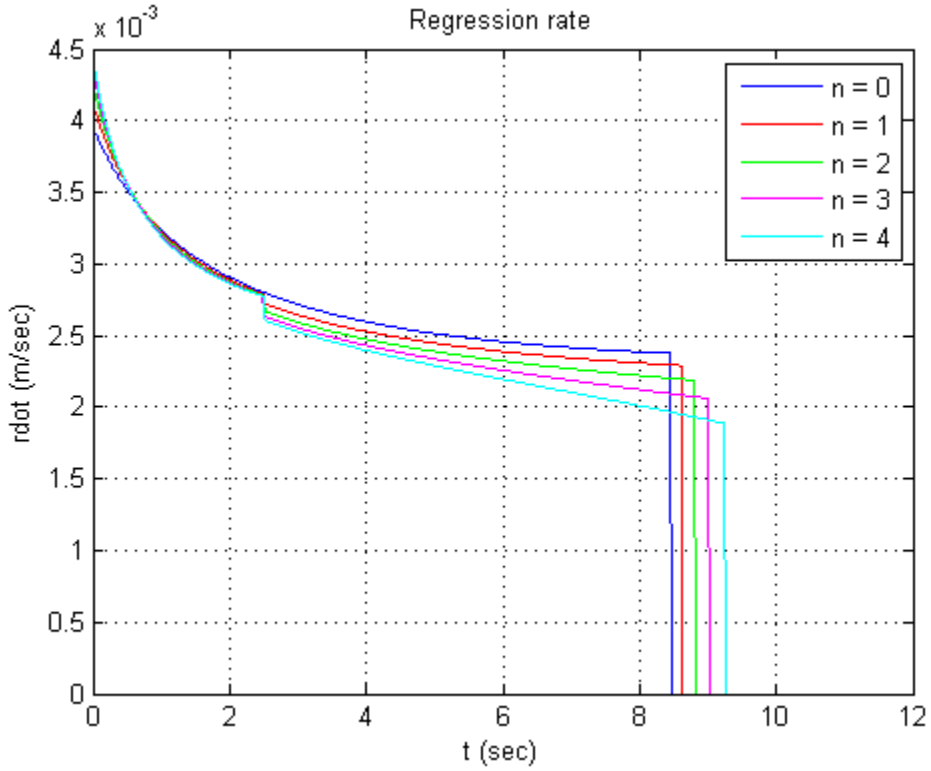
Chamber Pressure Profile



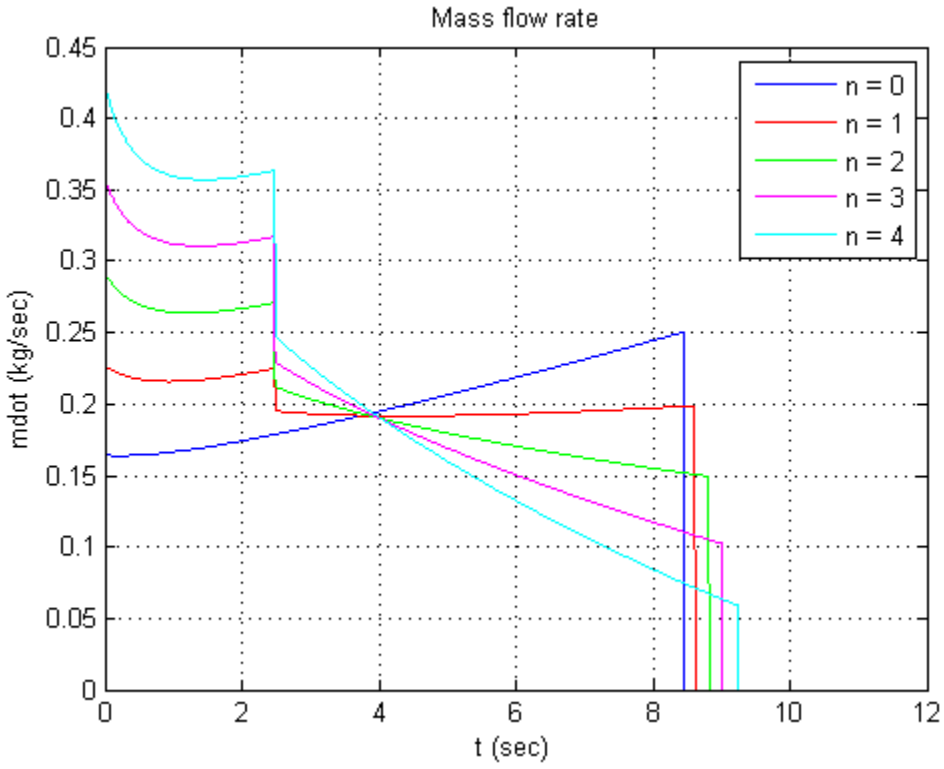
Chamber pressure starts at ambient and gets high value for more fractures because of larger burn area and smaller chamber volume. Also because of high chamber pressure, the motor with fractures may have more risk of failure (blowing up). The tip of grain fracture/s will hit the casing wall around 2.5 seconds. That is why the pressure drops off around that time (Burn area drops suddenly).

Burn times vary with number of fractures too. (around 8.46sec to 9.24sec)

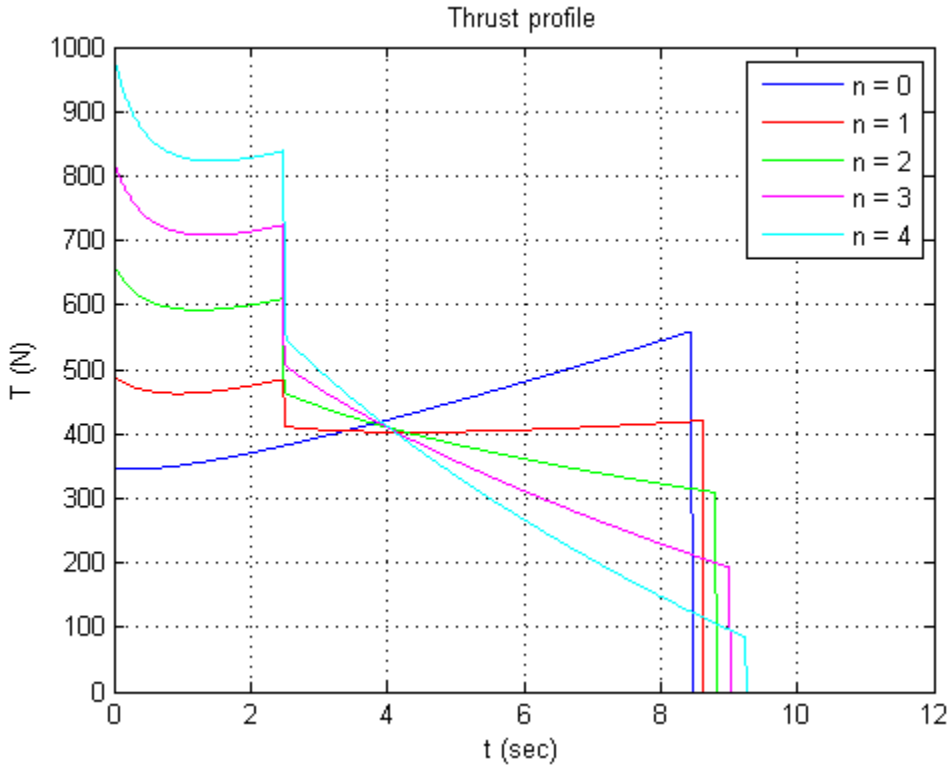
Regression Rate Profile



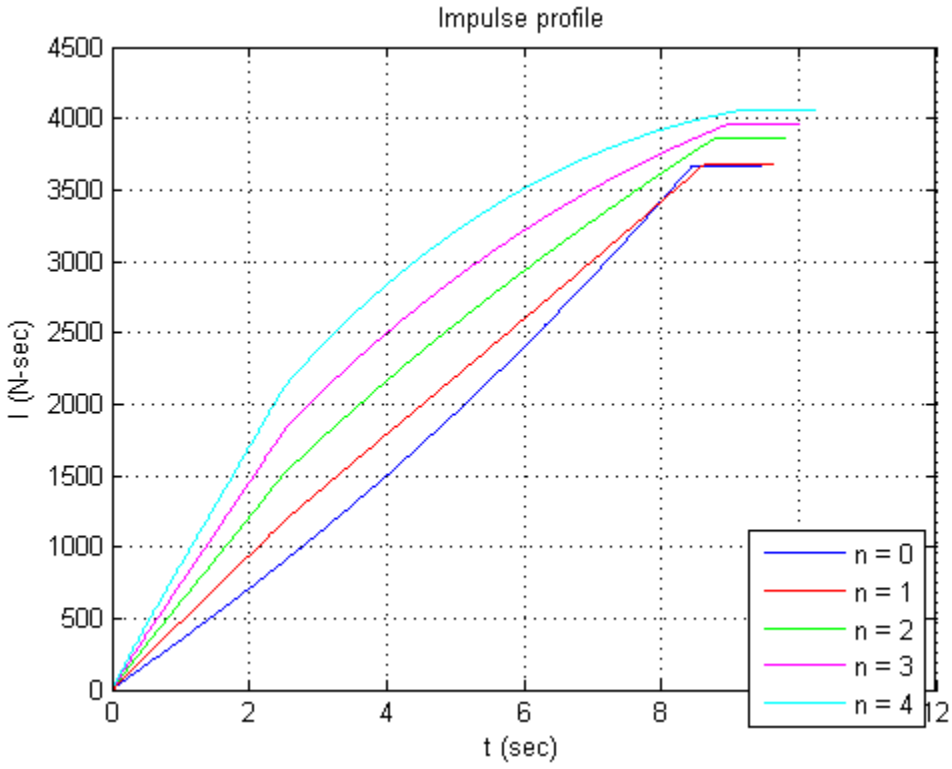
Massflow Rate Profile



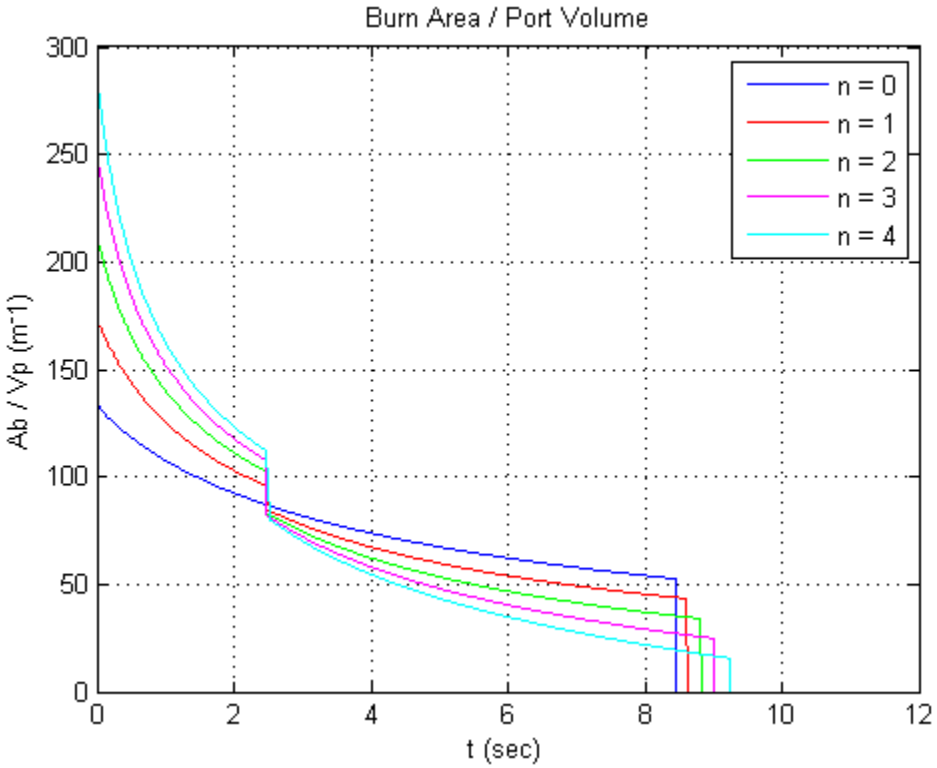
Thrust Profile



Total Impulse Profile



Ratio of Surface Burn Area to Port Volume



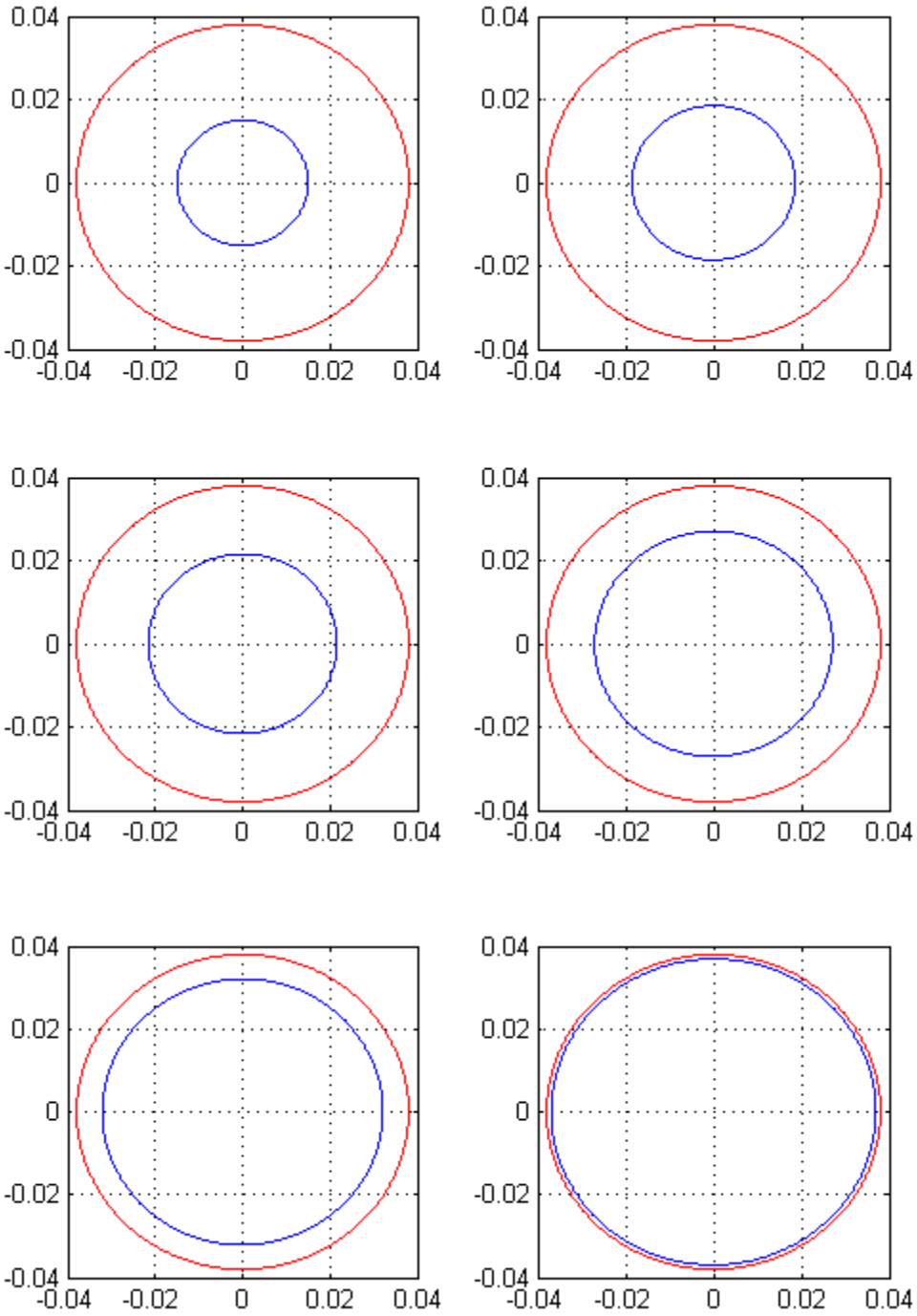
Mean Effective Isp

0 fracture : 221.50 sec
1 fracture : 222.52 sec
2 fractures : 235.04 sec
3 fractures : 241.72 sec
4 fractures : 248.44 sec

Port Profile at t = 0,1,2,4,6,8 sec

For no fractures,

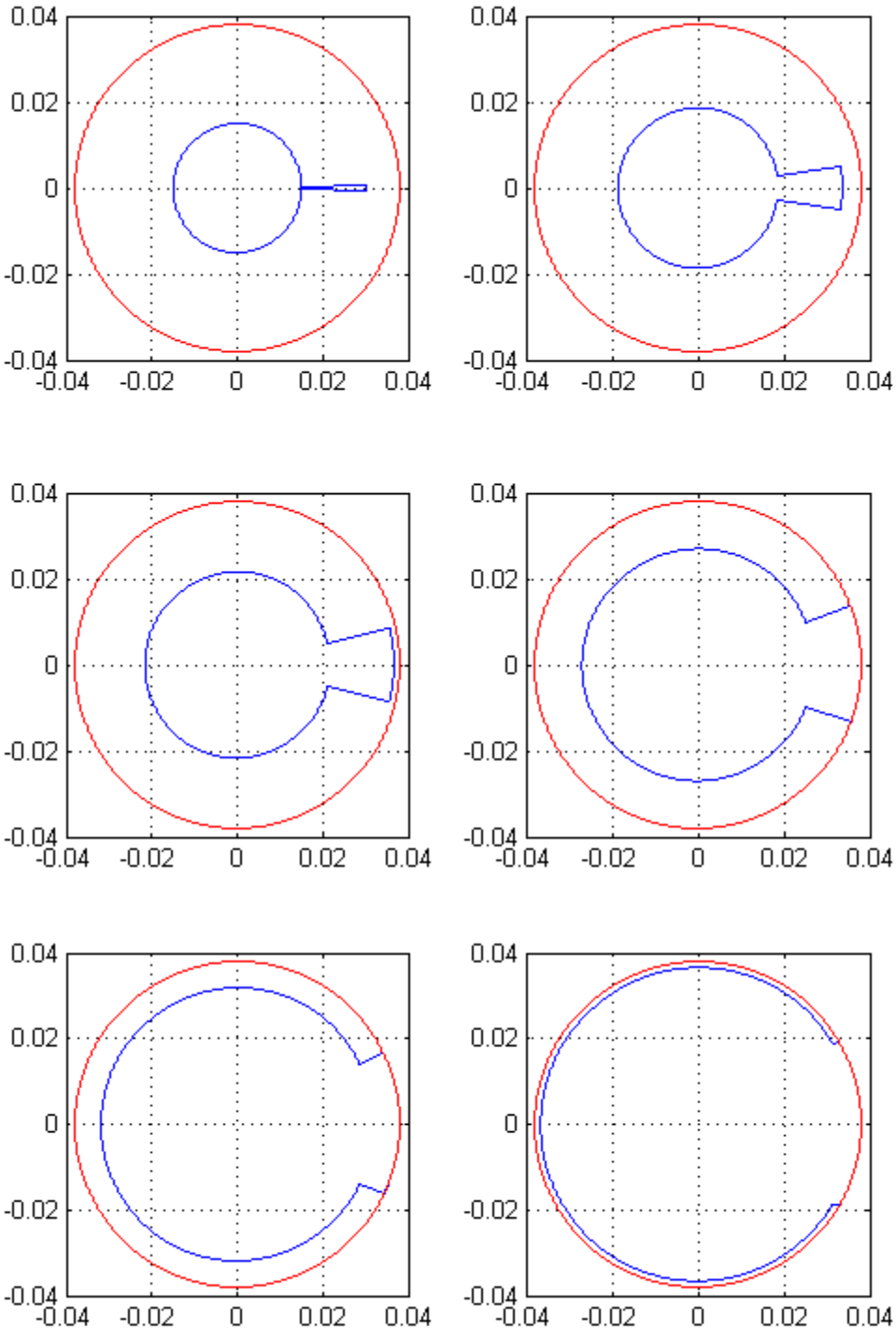
t = 0	t = 1
t = 2	t = 4
t = 6	t = 8



Port Profile at t = 0,1,2,4,6,8 sec

For 1 fracture,

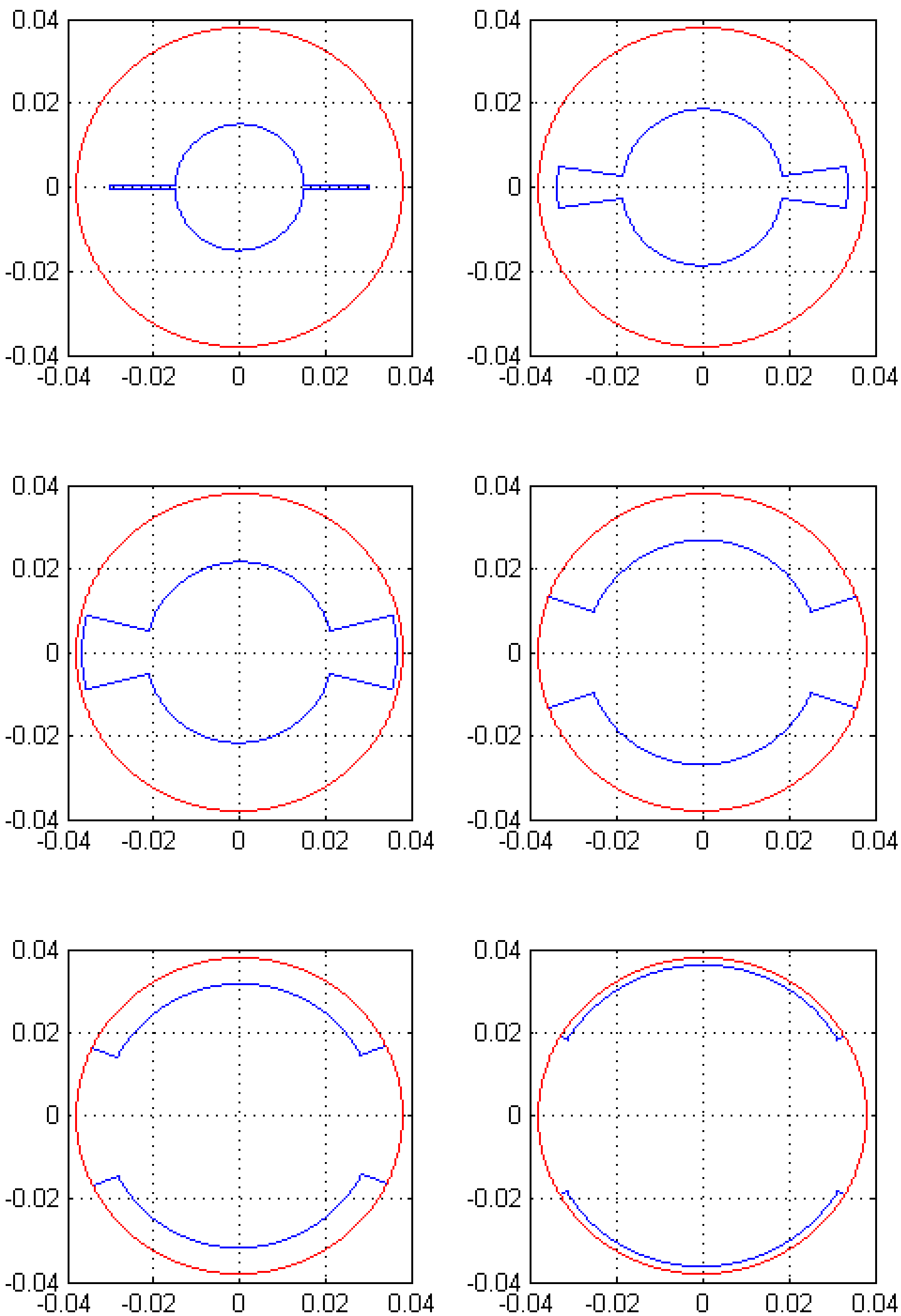
t = 0	t = 1
t = 2	t = 4
t = 6	t = 8



Port Profile at t = 0,1,2,4,6,8 sec

For 2 fractures,

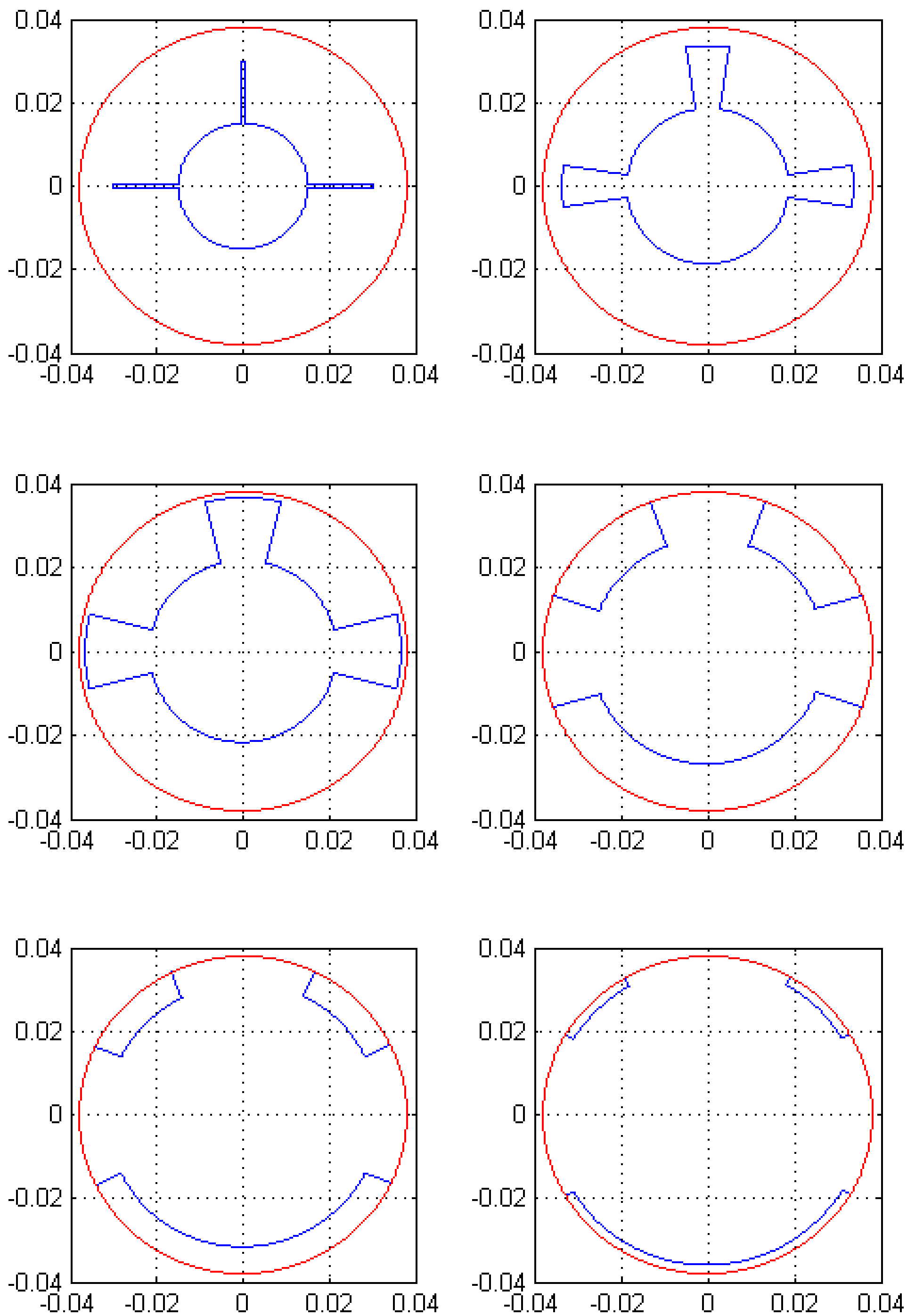
t = 0	t = 1
t = 2	t = 4
t = 6	t = 8



Port Profile at t = 0,1,2,4,6,8 sec

For 3 fractures,

t = 0	t = 1
t = 2	t = 4
t = 6	t = 8



Port Profile at t = 0,1,2,4,6,8 sec

For 4 fractures,

t = 0	t = 1
t = 2	t = 4
t = 6	t = 8