Laser Cooling Simulation:

Drift Ring (33.2 meter Circumference)
Cooling Section Length (6 meter)

Assumed population in Ground State, and spontaneous transitions occur at maximum lifetime of 8.1 ns

Testing response of cooling at various Saturation parameters (s = 1,3,10,20)

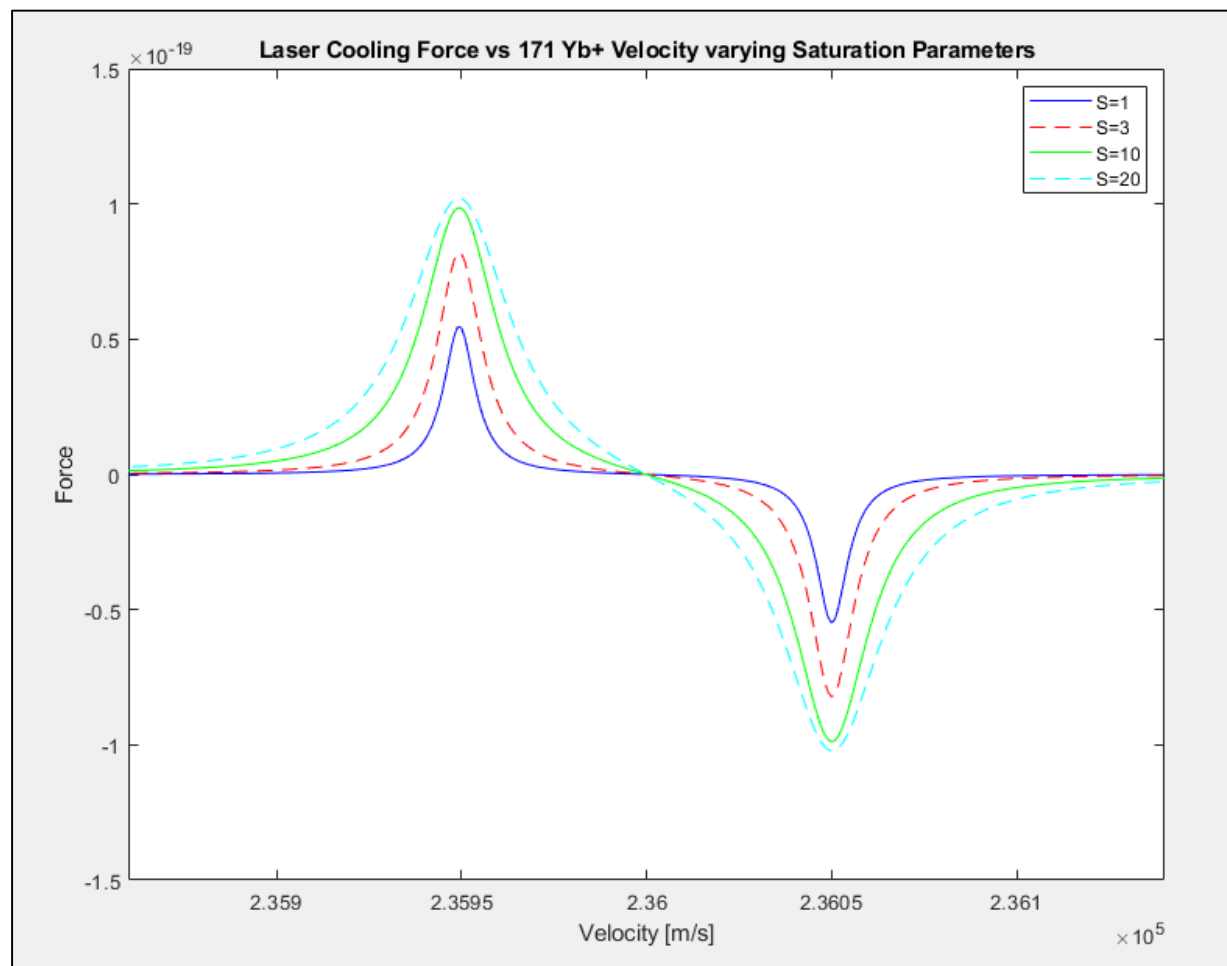Cooling Lasers are detuned at +/- 448 MHz

Next:

Implement RF Barrier

Implement IOTA Lattice (current lattice is 6 DOF drift)

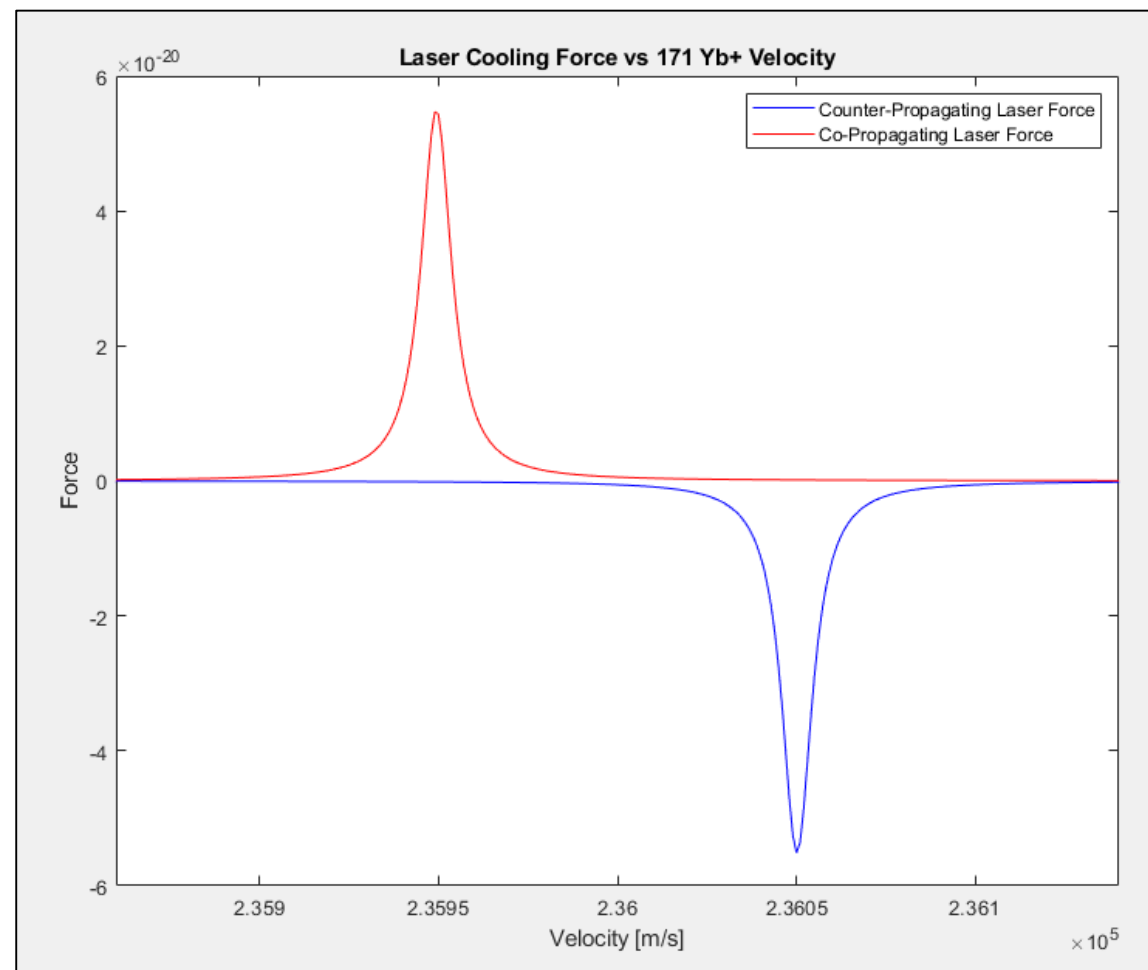Transverse coupling (coulomb interactions, secondary photon interactions)

Many particle simulation

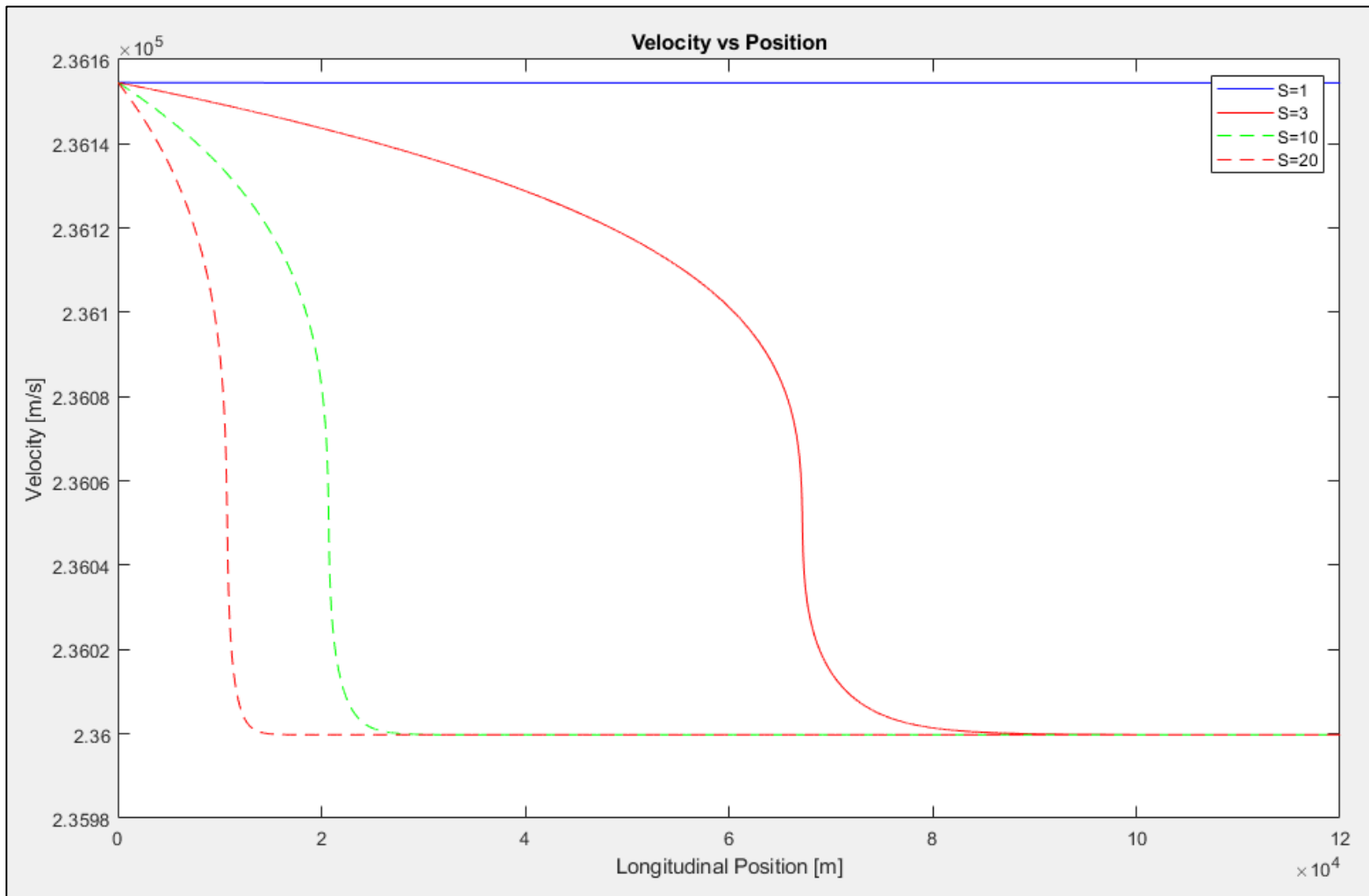Then Many particle simulation with interactions

Laser Cooling Force with 448 MHz detuning
Ideal ion velocity = 236,000 m/s

Varying the saturation parameter s

Cooling profiles symmetric about the ideal ion velocity

Longitudinal Cooling where the velocity of the Ion exceeds the
Ideal particle velocity of 236,000 m/s
Velocity vs Longitudinal Position where each run is 33.2 meters long
Plot indicates s =1,3, and 10 cool by 2,600 runs in the ring