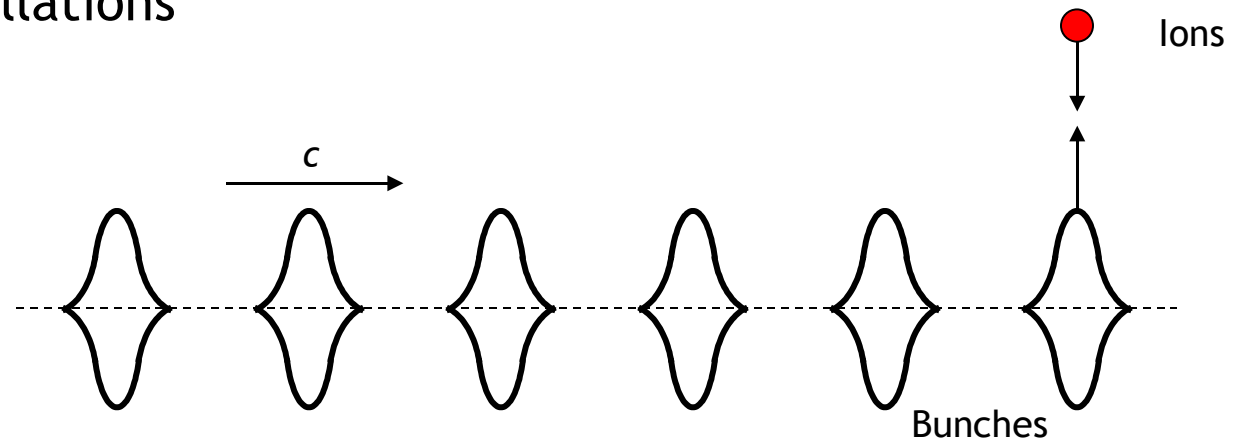
FII Simulation Development (1)

Program #1

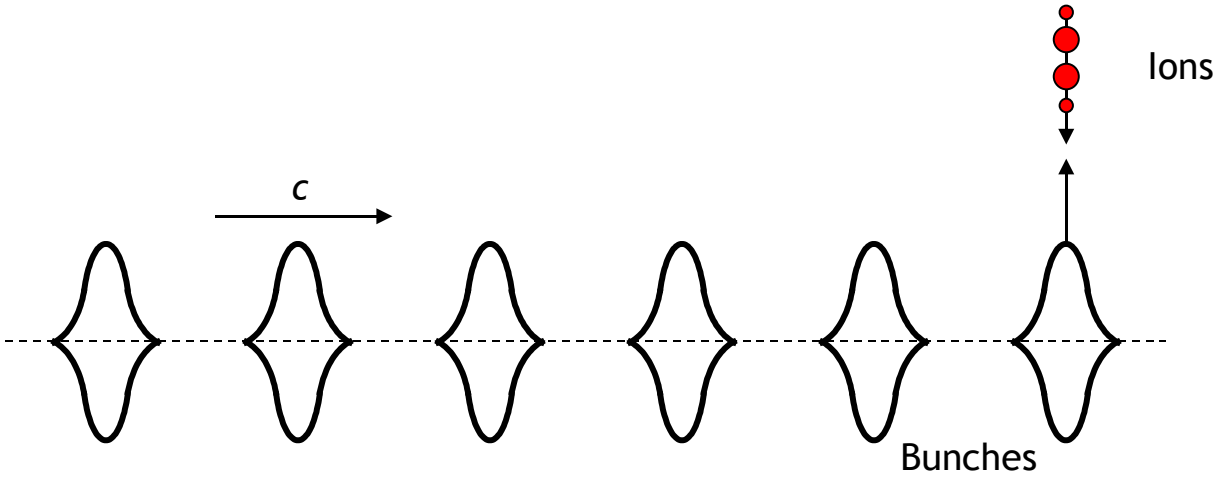
- Single ion (macroparticle) with initial displacement
- Evenly spaced Gaussian bunches with no transverse offset
- Ion interacts with the beam as before (receives kicks from evenly spaced slices)
- Each bunch receives a kick (ion Δp) and starts betatron oscillations



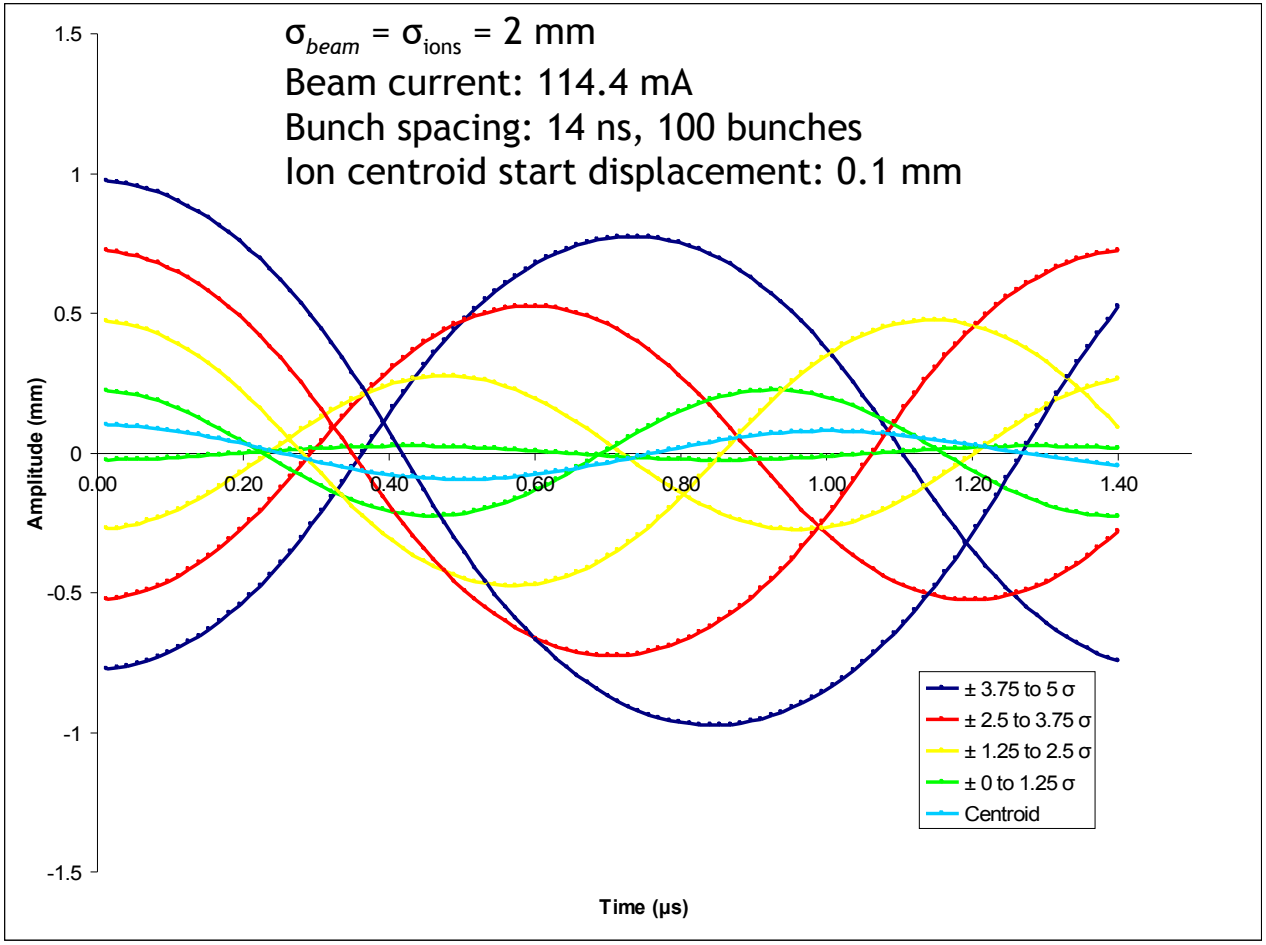
FII Simulation Development (2)

Program #2

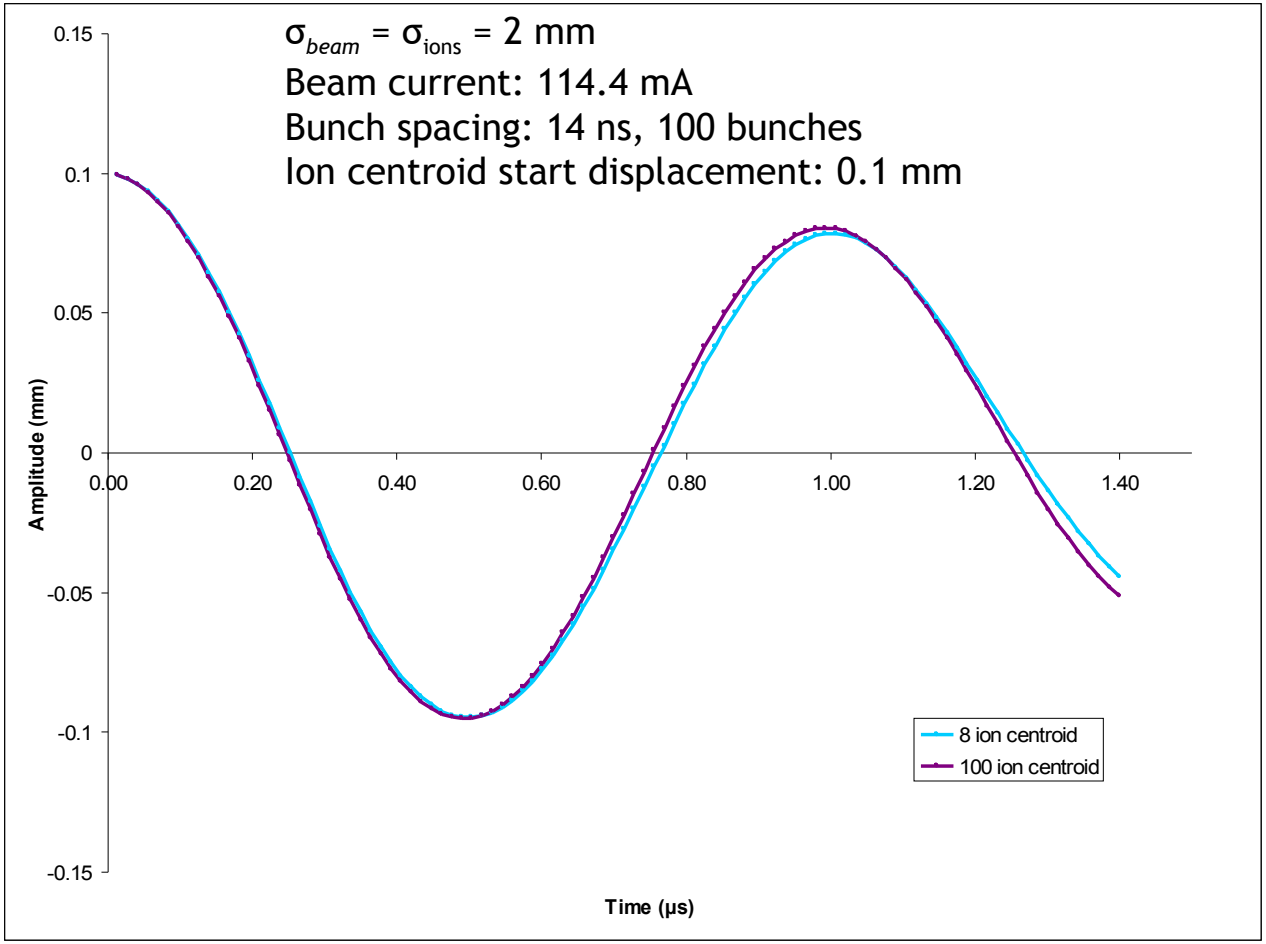
- Many ion macroparticles with the same longitudinal position
  - Used Gaussian distribution for transverse ion density
  - Compute kick on bunch from summed ion Δp
- Otherwise, same assumptions used



Ion Macroparticle Oscillations



Ion Macroparticle Centroids



FII Simulation Development (3)

Program #3

- Many ion macroparticle distributions with different longitudinal positions (10 ns apart)
  - Initial ion centroids determined by a "0th bunch", which has betatron oscillations
- Nonzero initial bunch displacements/velocities incorporated