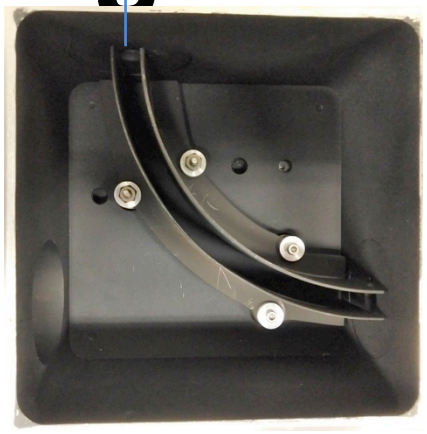
Weekly Updates 1

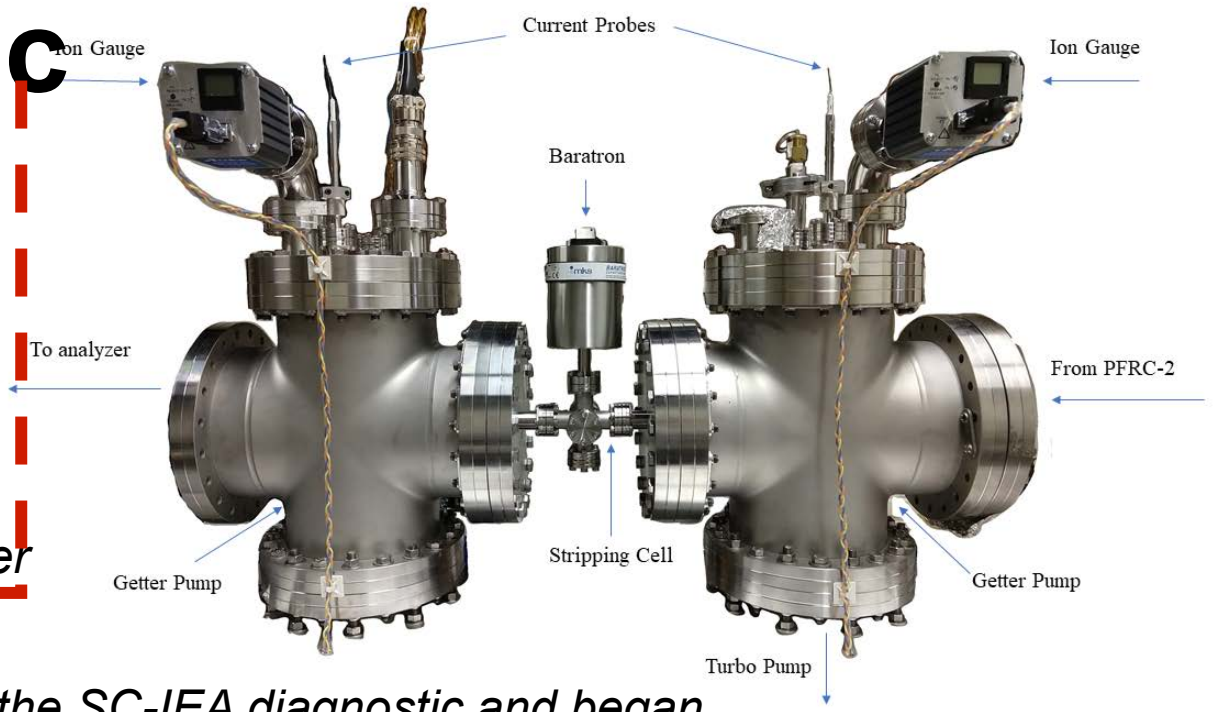
Thursday, June 16

Devdigvijay Singh

Ion Energy Analyzer Diagnostic



Curved-plate analyzer



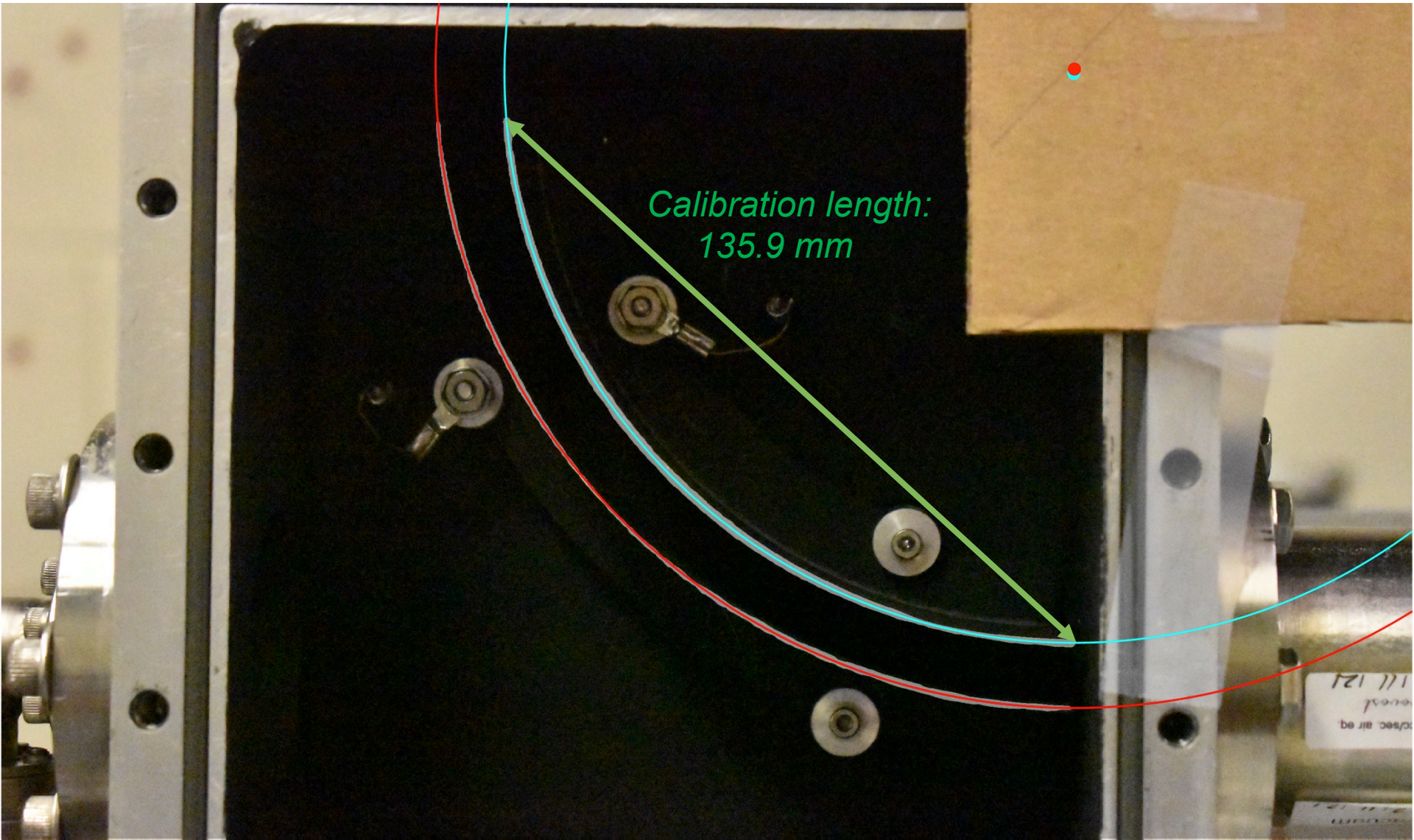
Noah began work on the SC-IEA diagnostic and began calibration.

Areas of improvement:

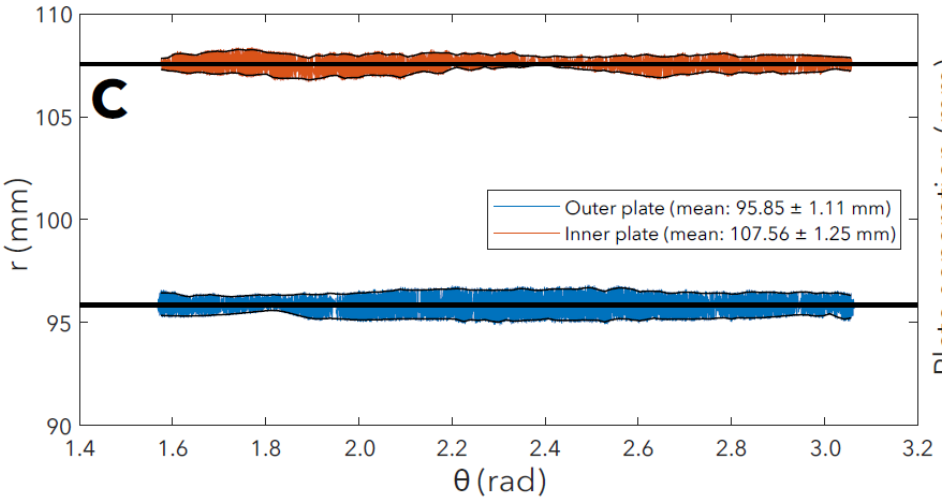
1. *Difficult to measure radii of curvature accurately*
2. *Approximates E-field as infinitely long, cylindrical plates*
3. *Approximates trajectory as 2D beam without angular deflection*

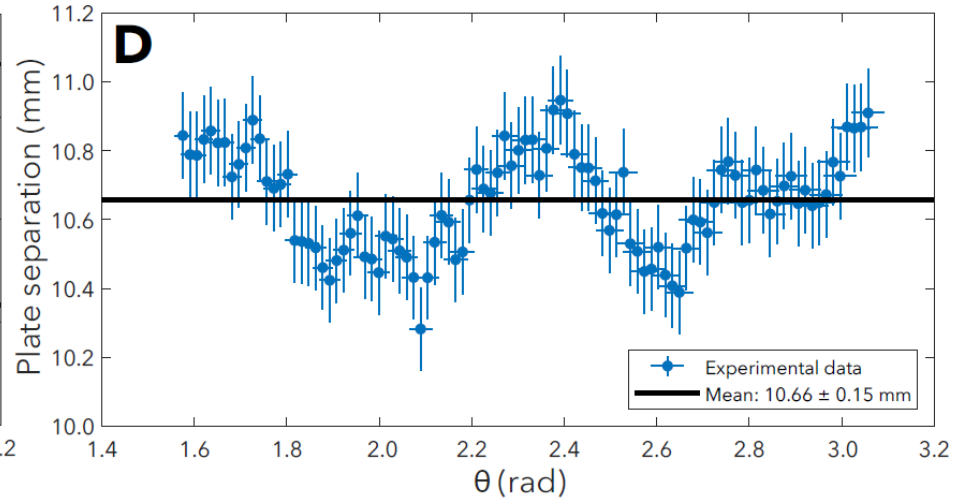
***Goal:** Accurately predict the allowed ion energy distributions through curved plate analyzer*

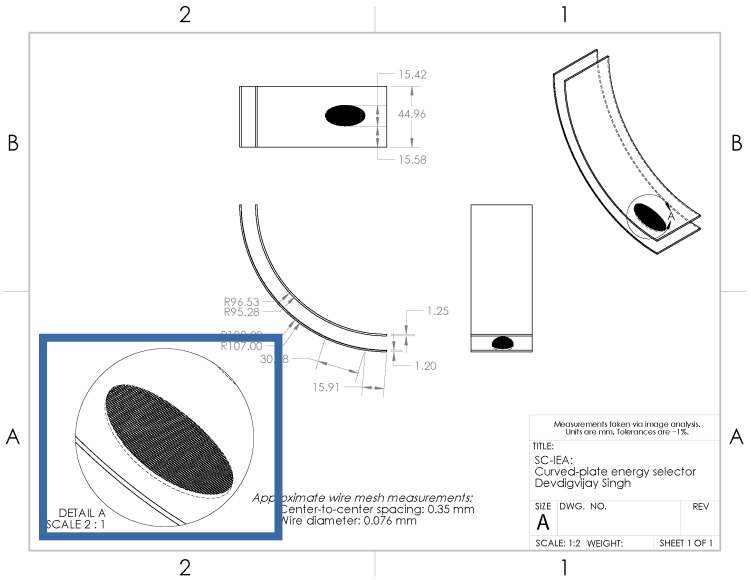
Measuring plate profiles via

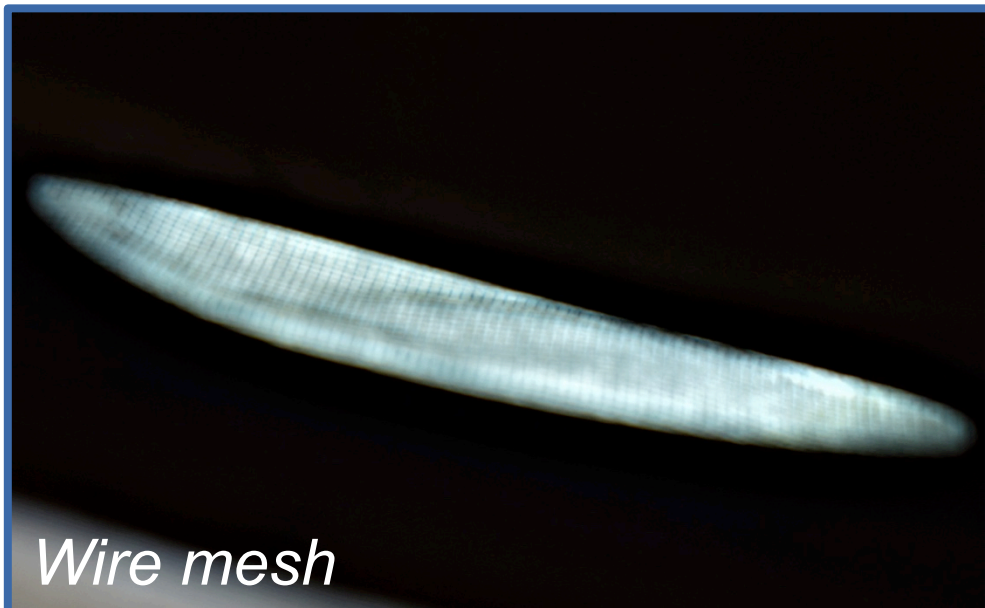


Measuring plate profiles via

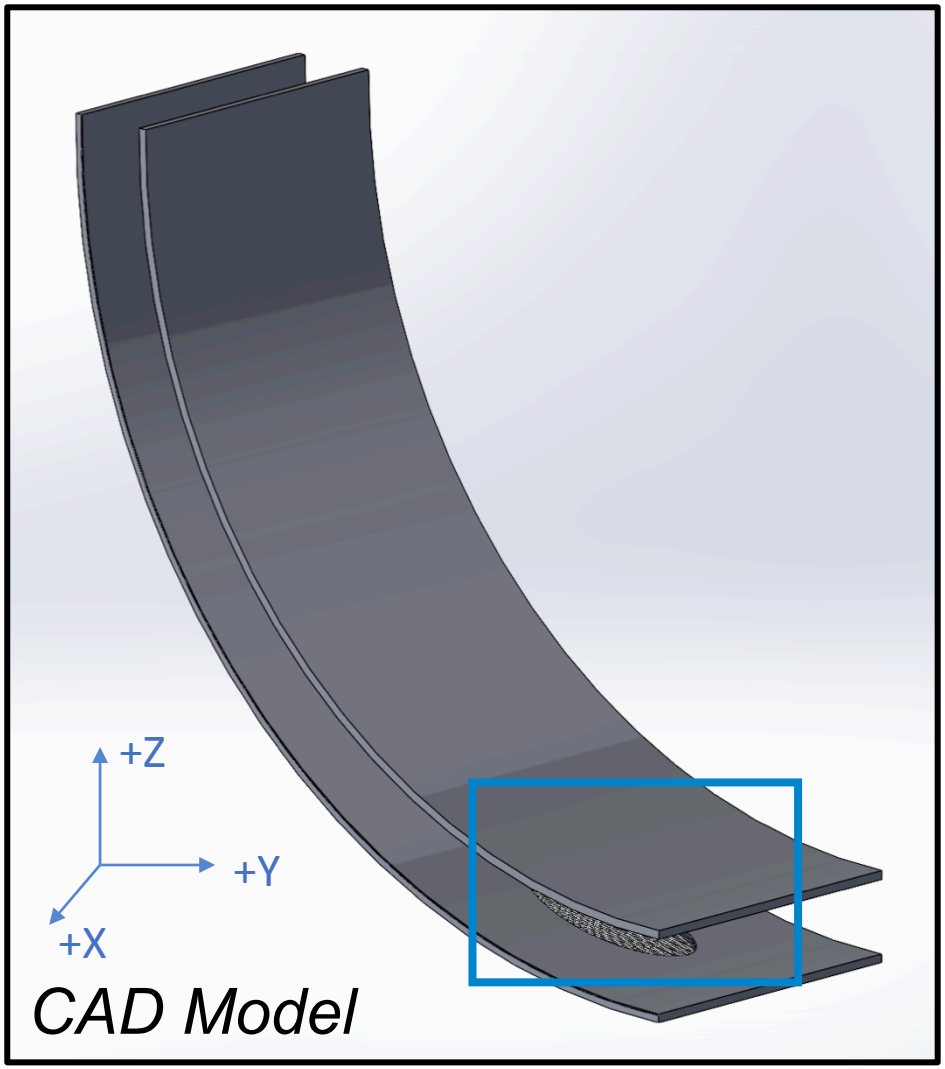


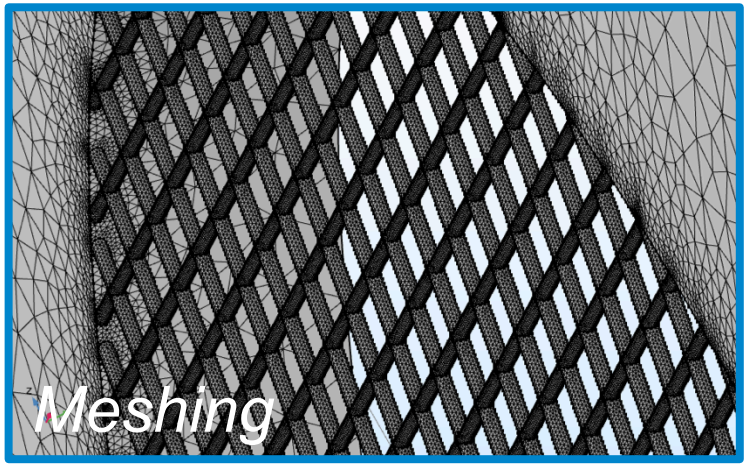


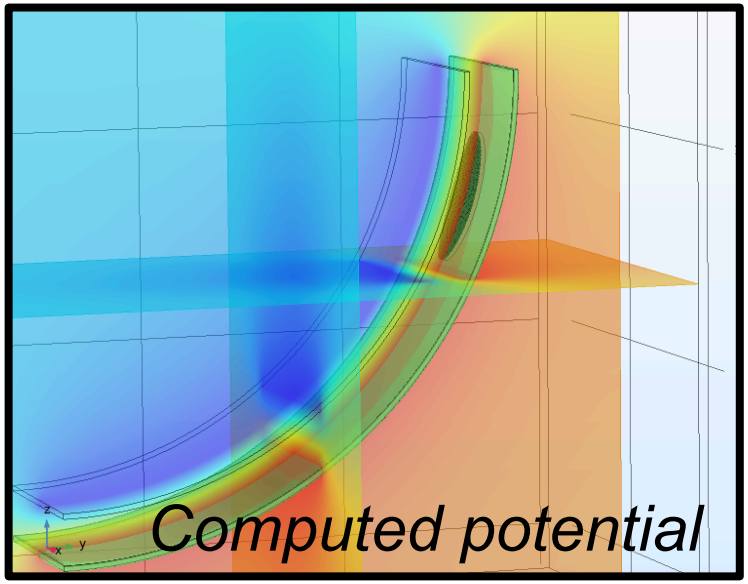




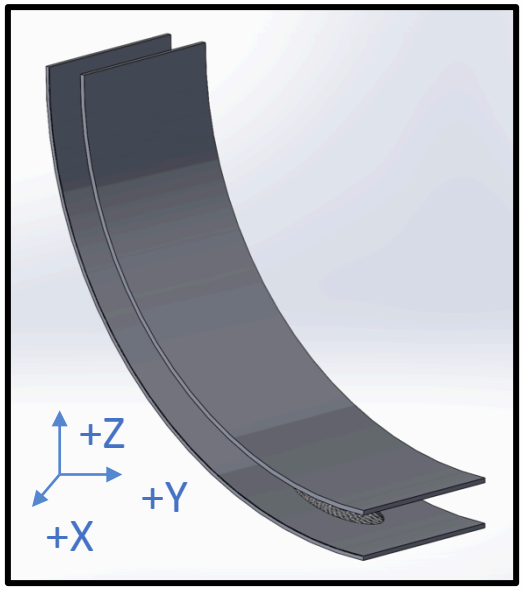
Simulating E-field with FEM



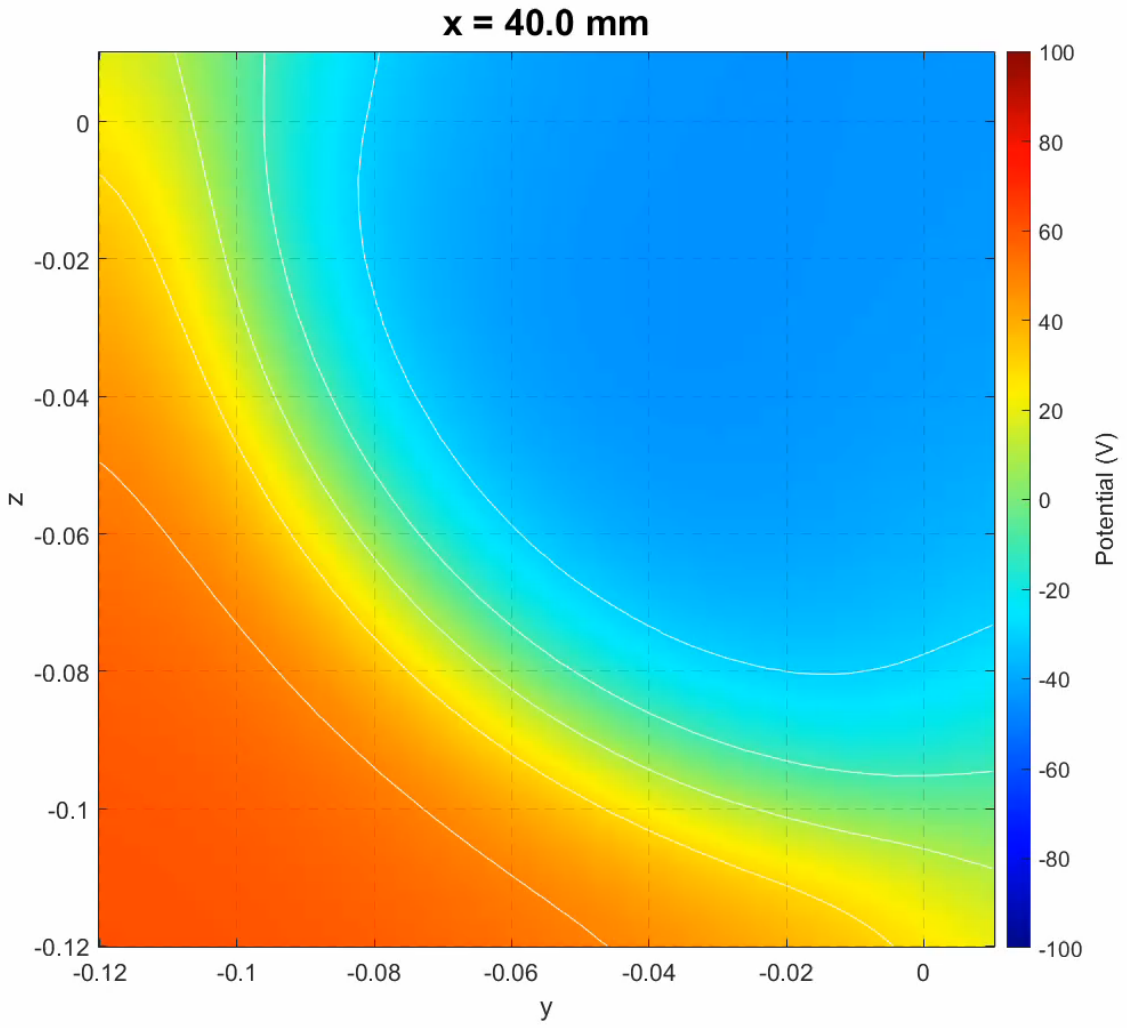




Simulating E-field with FEM



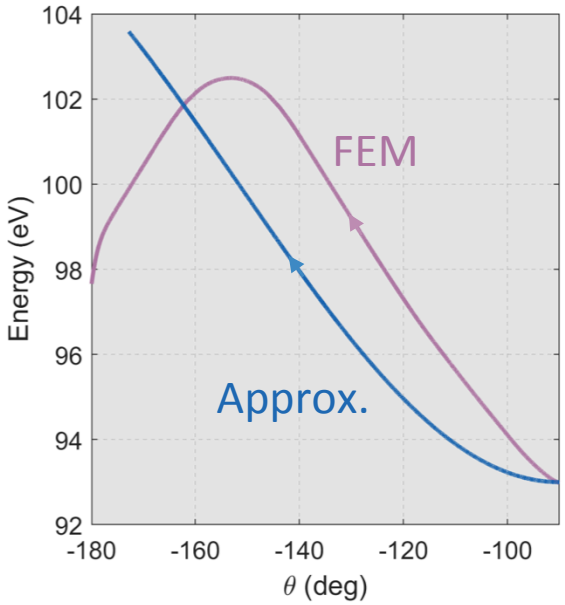
CAD Model

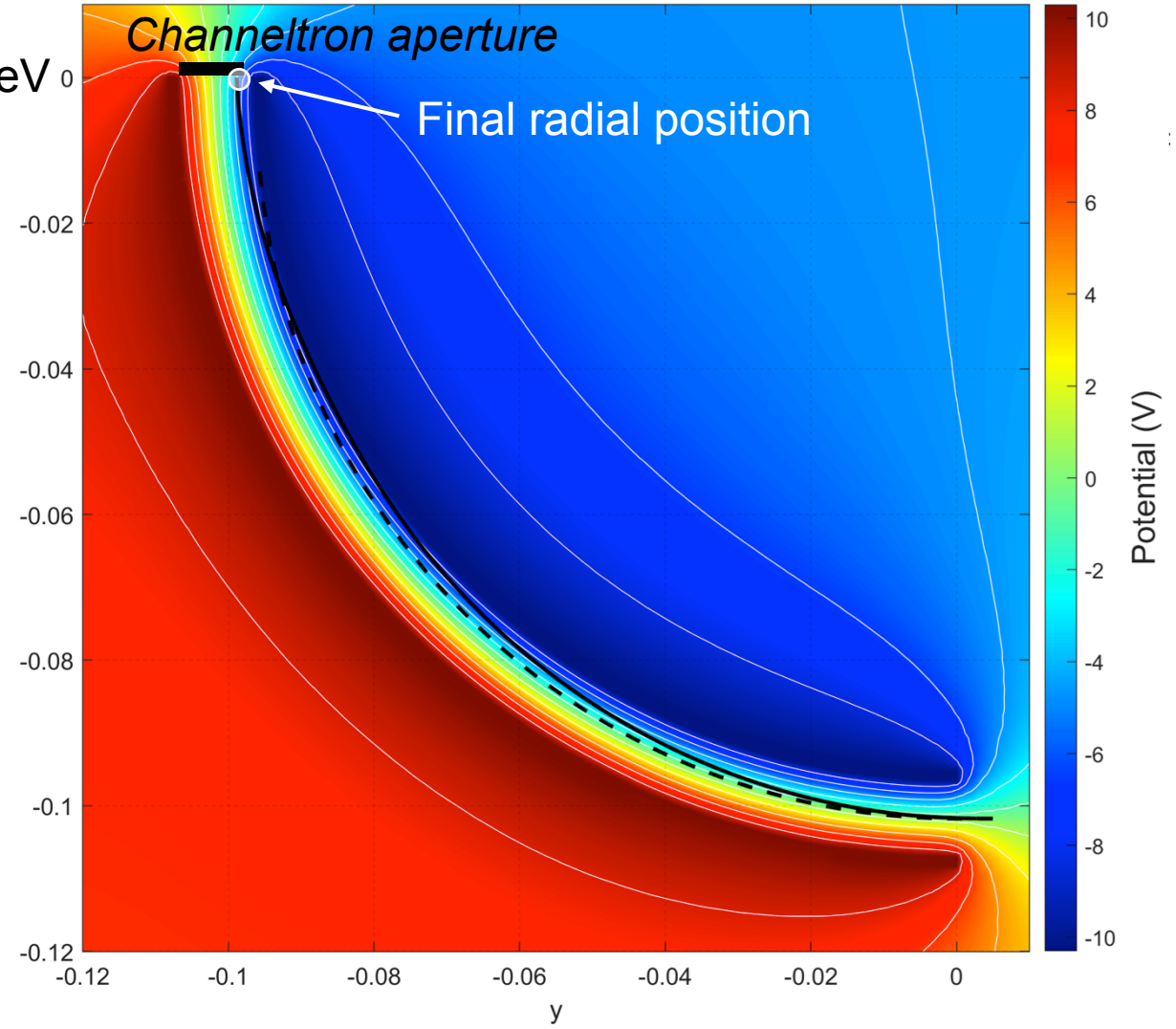


Trajectory Results

FEM trajectory
Approximation trajectory

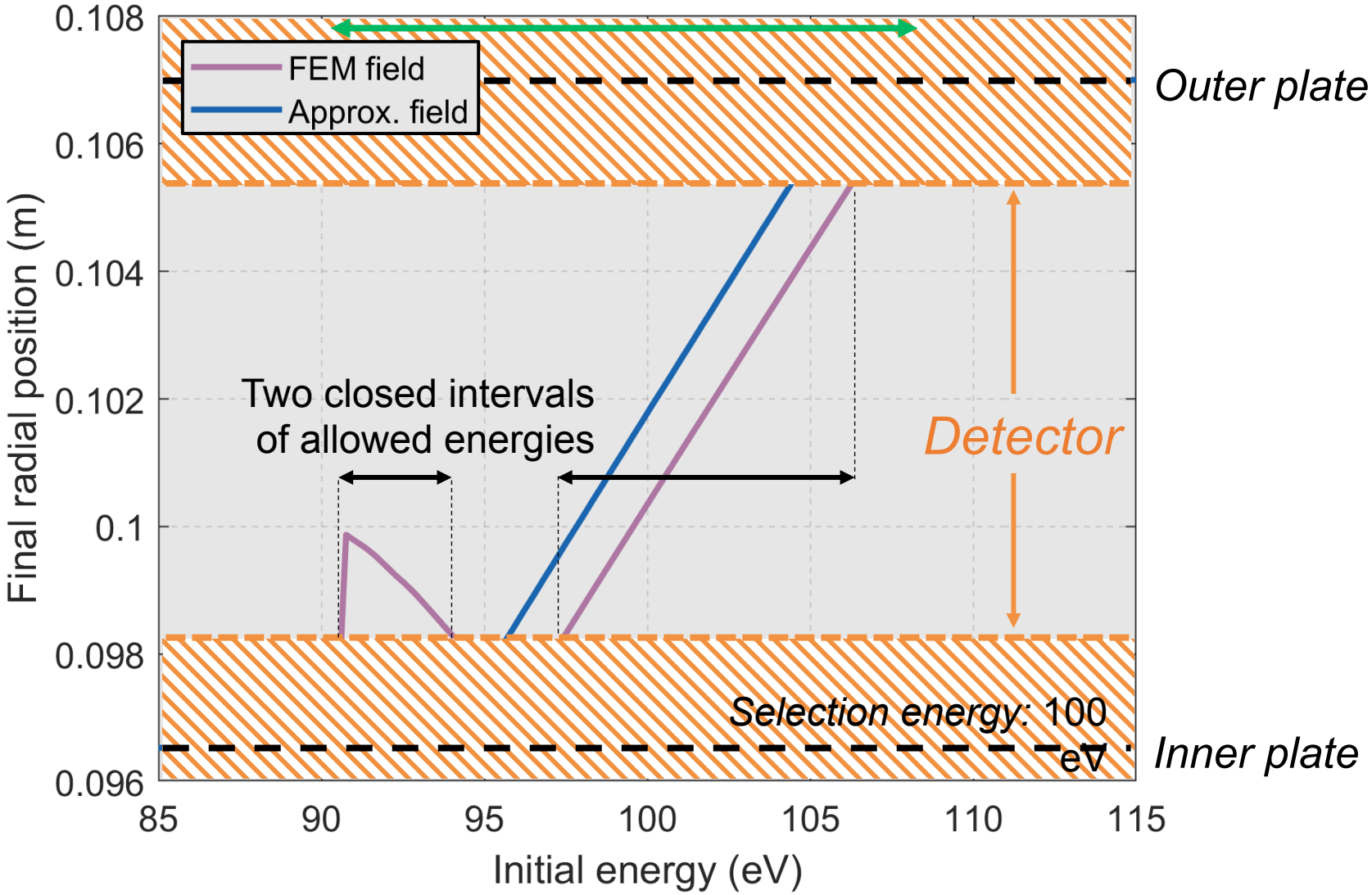
Selection energy: 100 eV
Initial particle energy: 93 eV





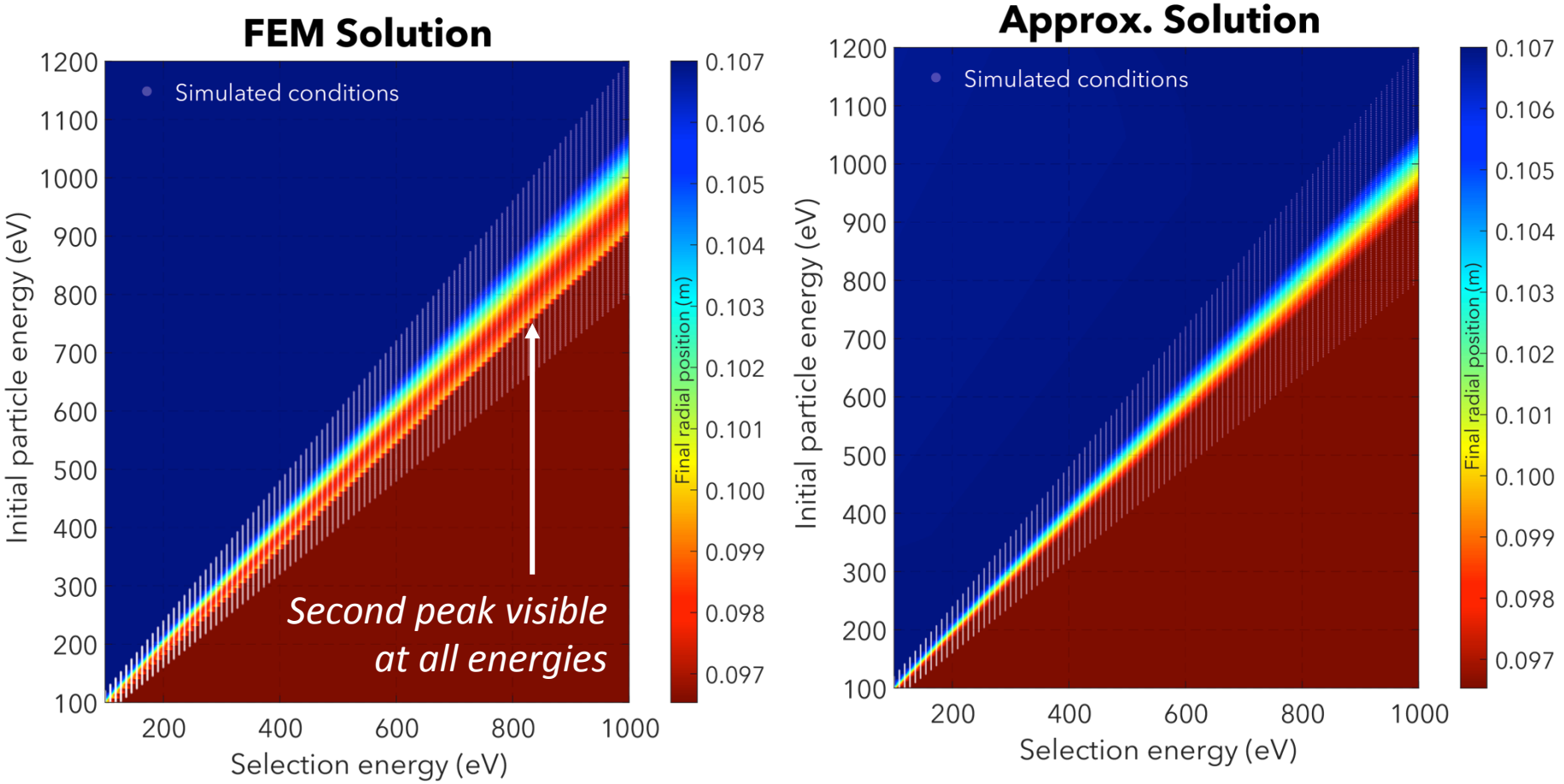
Selected Energies

Larger range of allowable energies consistent with experimental measurements



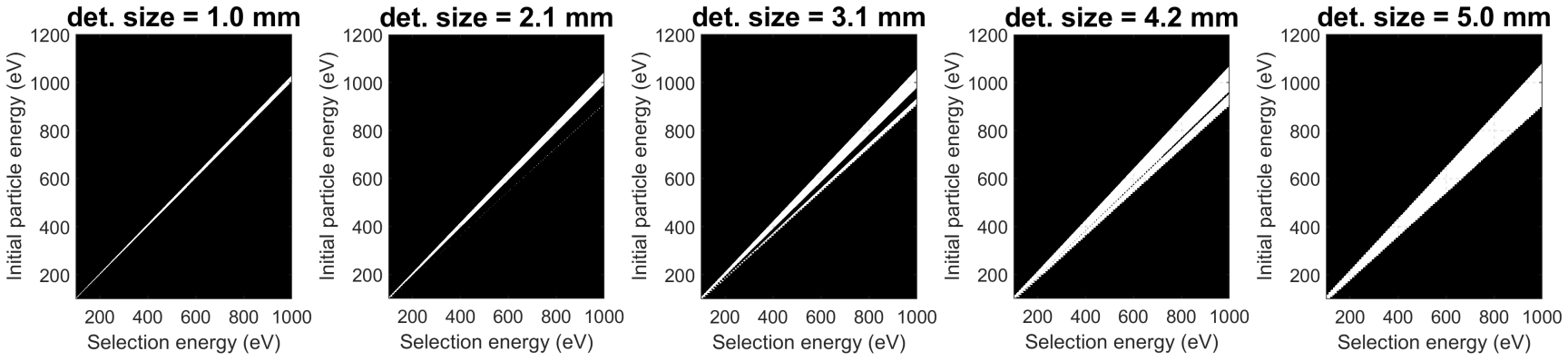
Selected Energies

Does this occur at other energies?

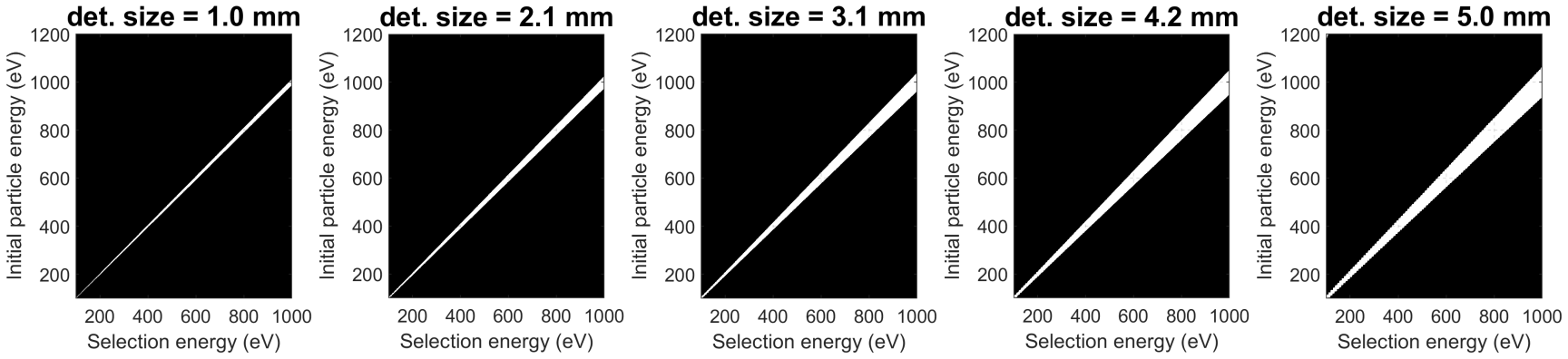


Selected Energies

FEM



Approximate



Next steps: *Estimate scattering of beam due to self-repulsion and collisions*