

Update on VSim simulation

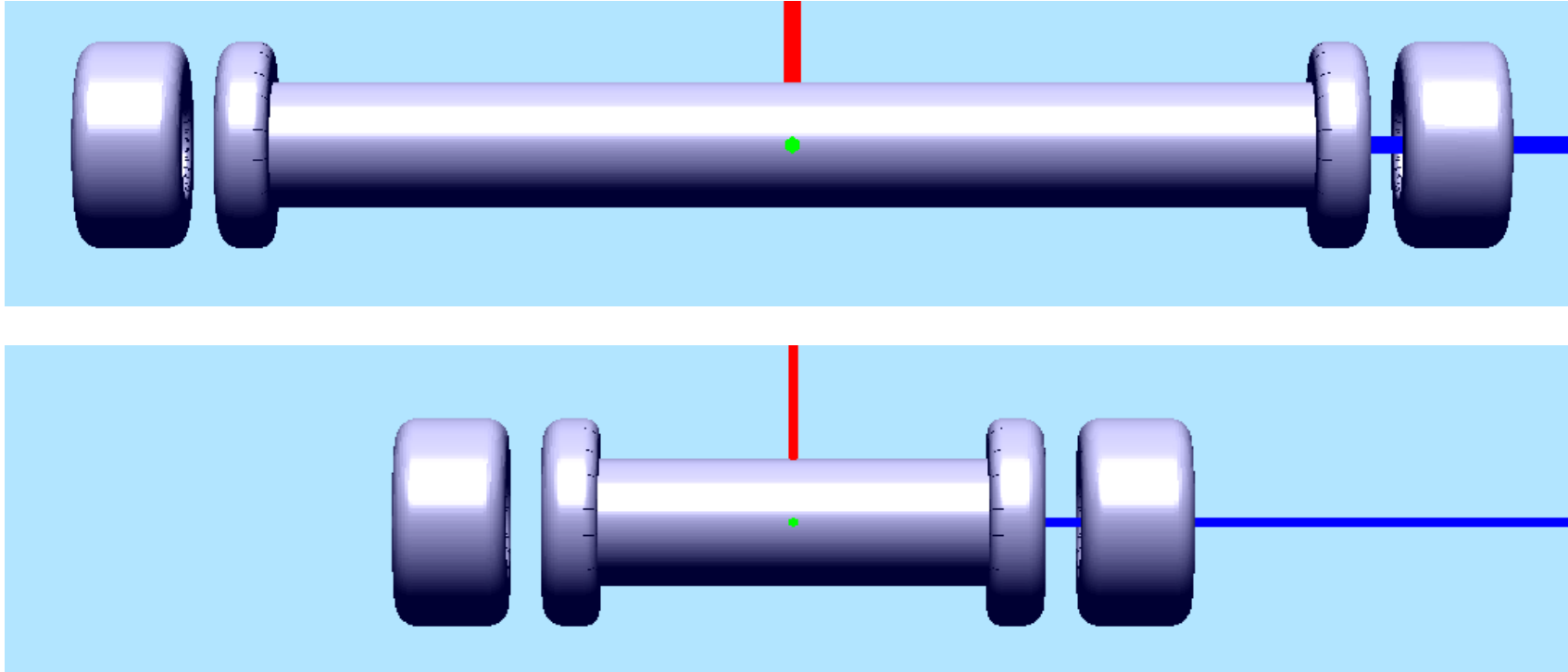
Titus Dascalu

23rd July 2020

Simulation #5 (parameters)

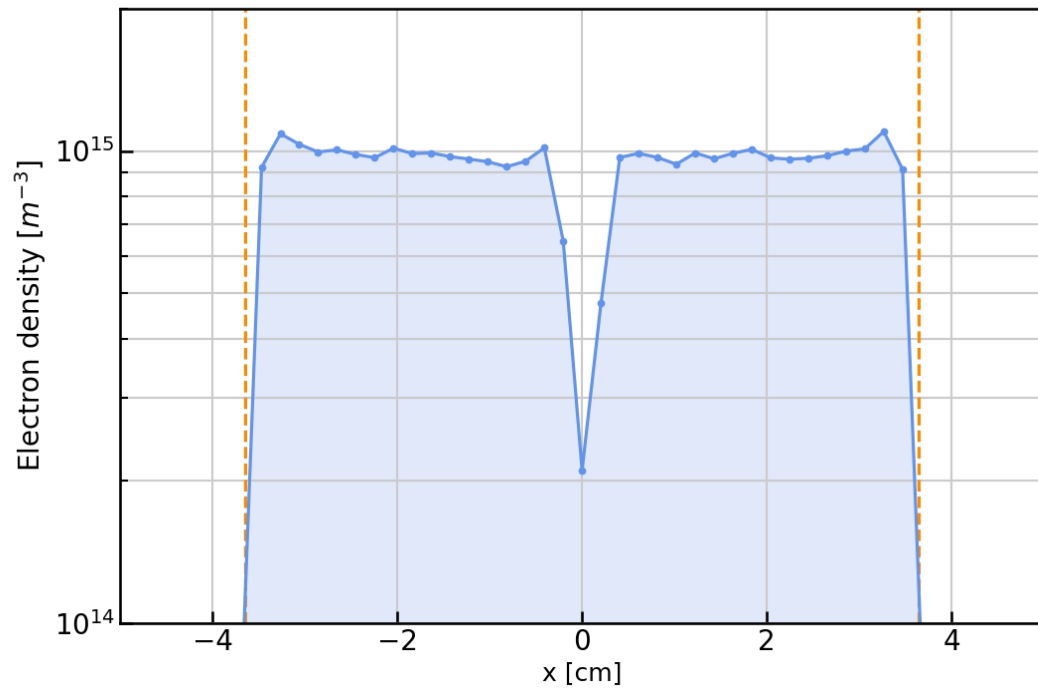
- Some of the more important parameters:
 - Electron density $n_e = 10^{15} \text{ m}^{-3}$
 - External B-field (spatially uniform) – 100 mT
 - Time step $dt = \text{plasma period} / \text{number of steps per plasma period}$
 - Number of steps per plasma period: 10
 - Number of simulation steps: 1825 (0.64 us)
 - Grid size: 50 x 50 x 300
 - Macroparticles per cell: 5
 - Cathode voltage - set based on n_e and the longitudinal confinement condition
- At this stage there is no secondary emission included in the simulation or background gas

Simulation #5 (parameters)

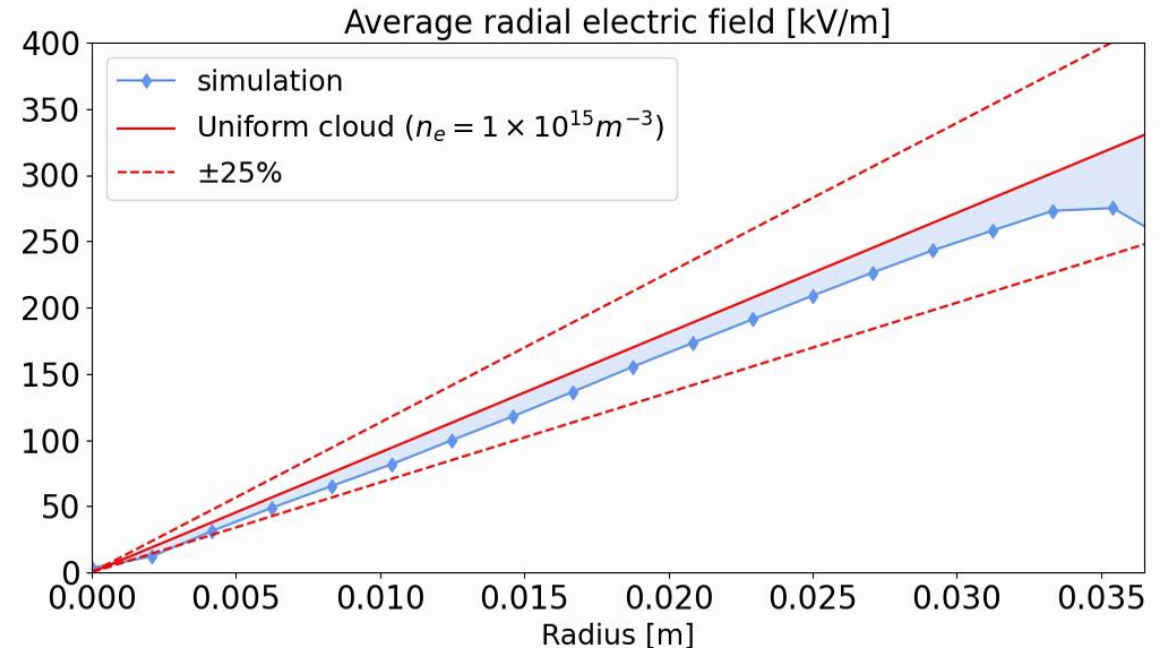


Reduce the length of the anode by 0.5 m

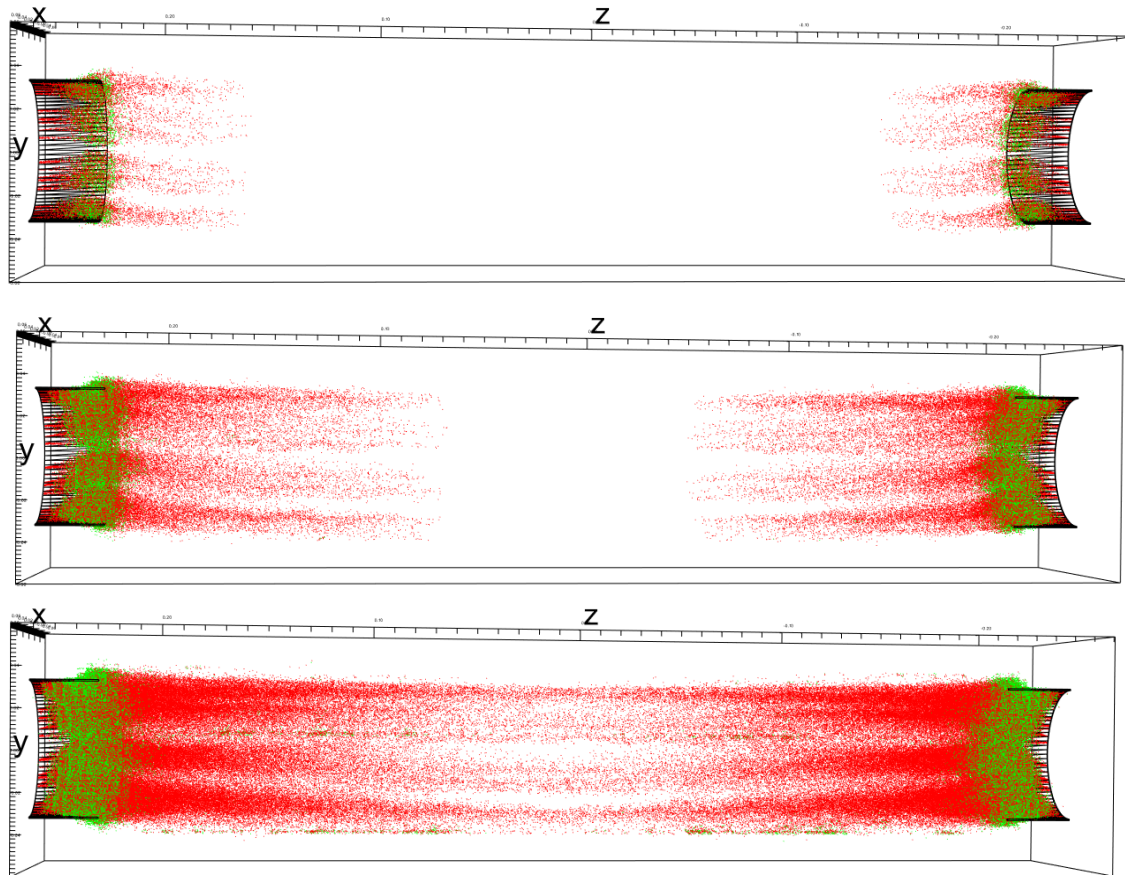
Radial electron distribution



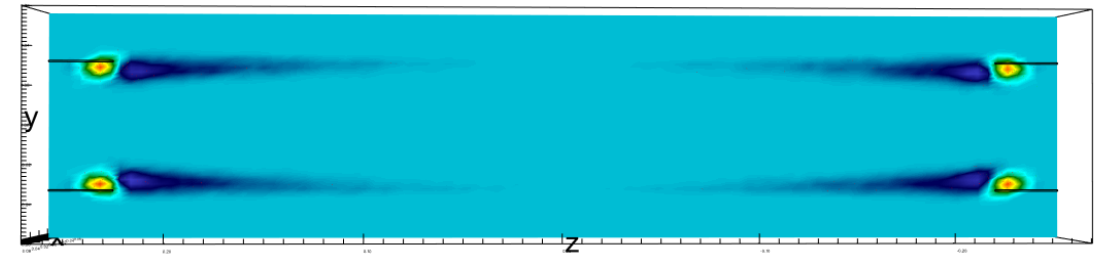
640 ns



Plasma discharge



Toy simulation of previous prototype



Charge density

