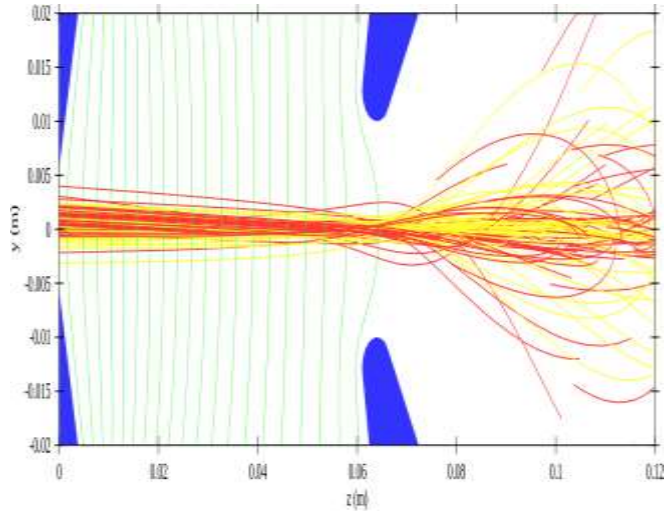
Secondary Electrons

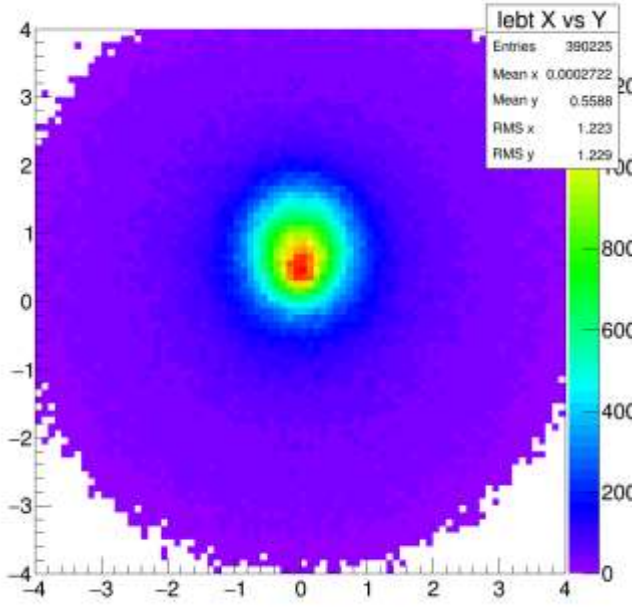
R. Montoya

C. Valerio

- This study is about electrons generated by secondary emission from the cathode
- where maximum energy for the electrons is 1% of the energy of the ions hitting the cathode.
- The electron yield is equal to 1



Ions hitting the cathode



Cathode Ions bombardment

Electron beam generation

- Now the electron beam is generated at the cathode surface following a normal direction to the ion beam trajectory colliding with the cathode surface.
- The beamline magnetic parameters were the same as the normal beam, therefore the secondary electron beam transmission is not optimized.
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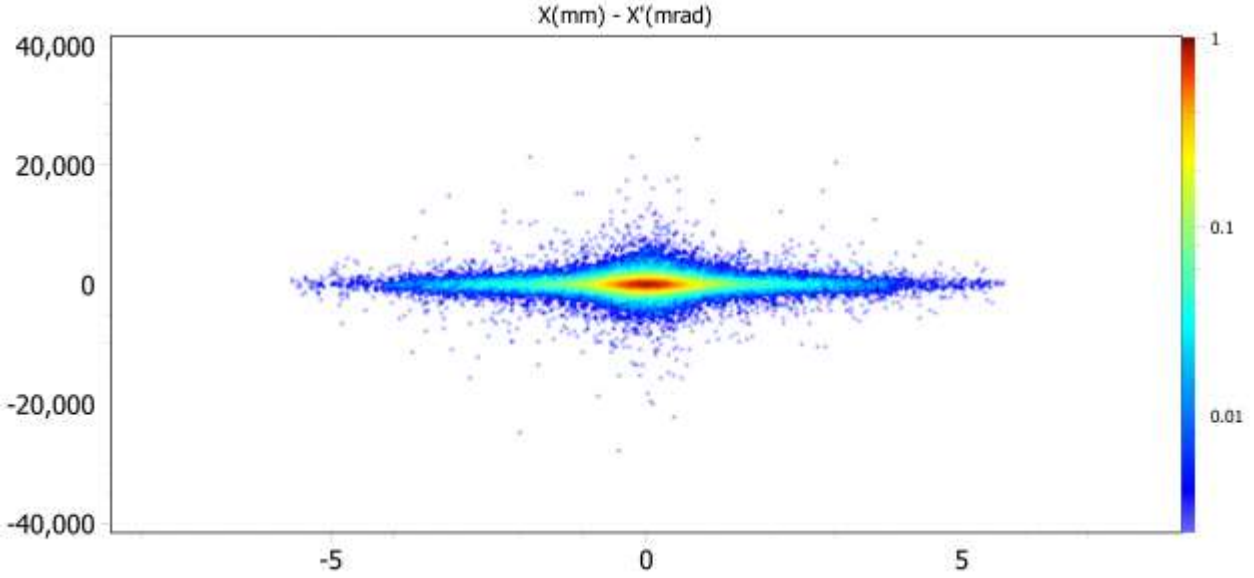
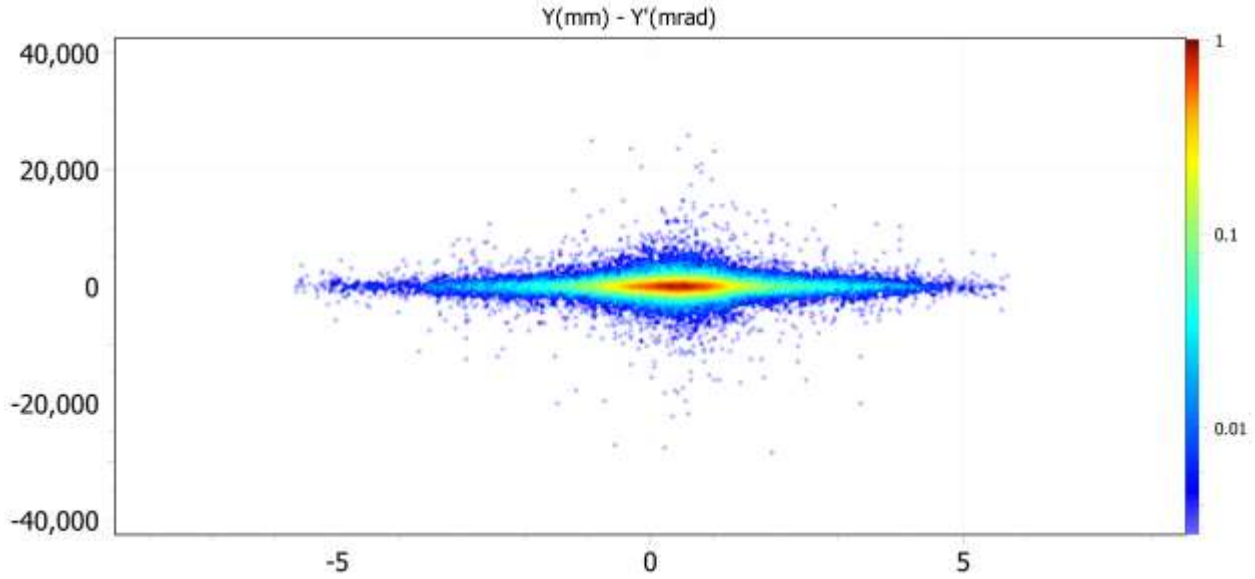
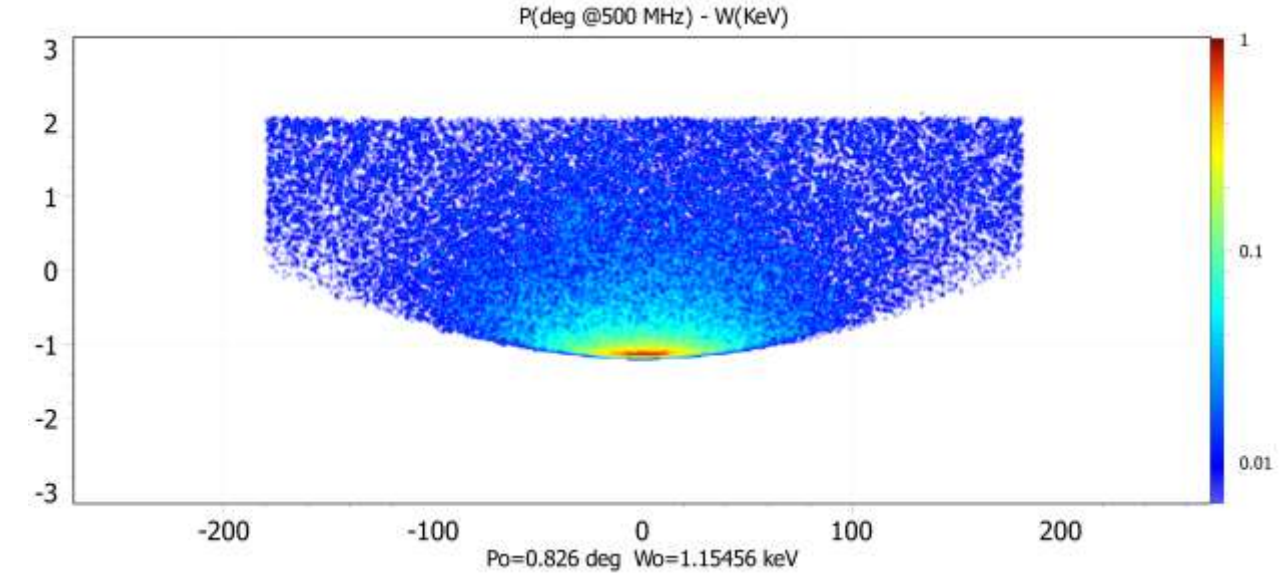
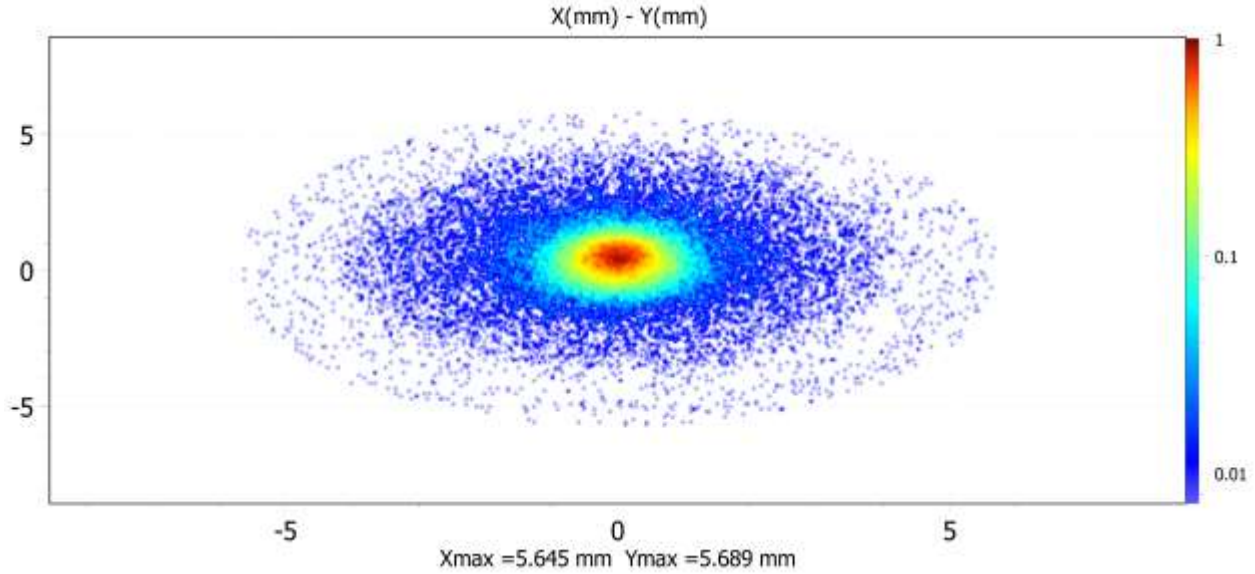
Secondary electrons in the cathode, 50 000 electrons

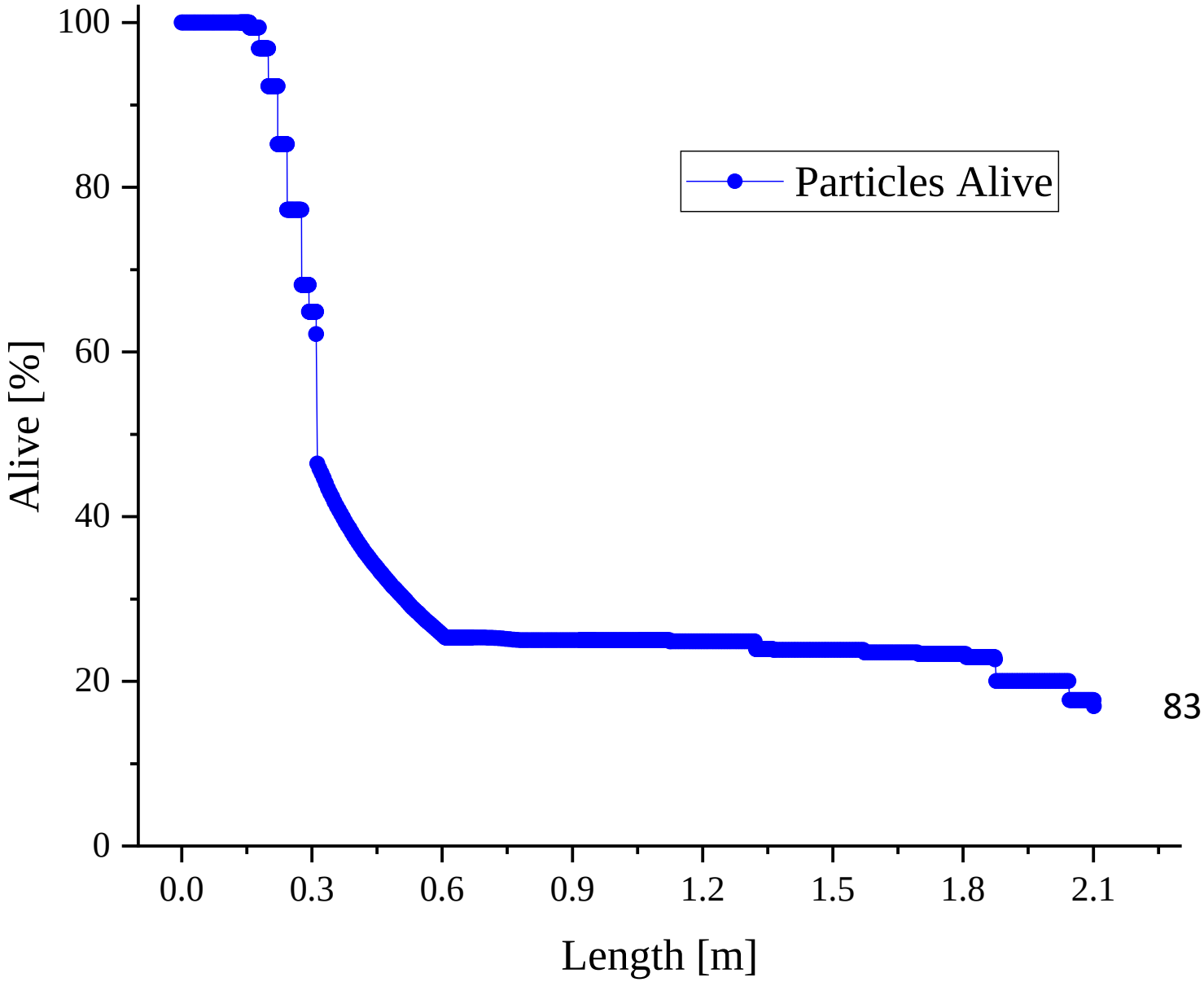




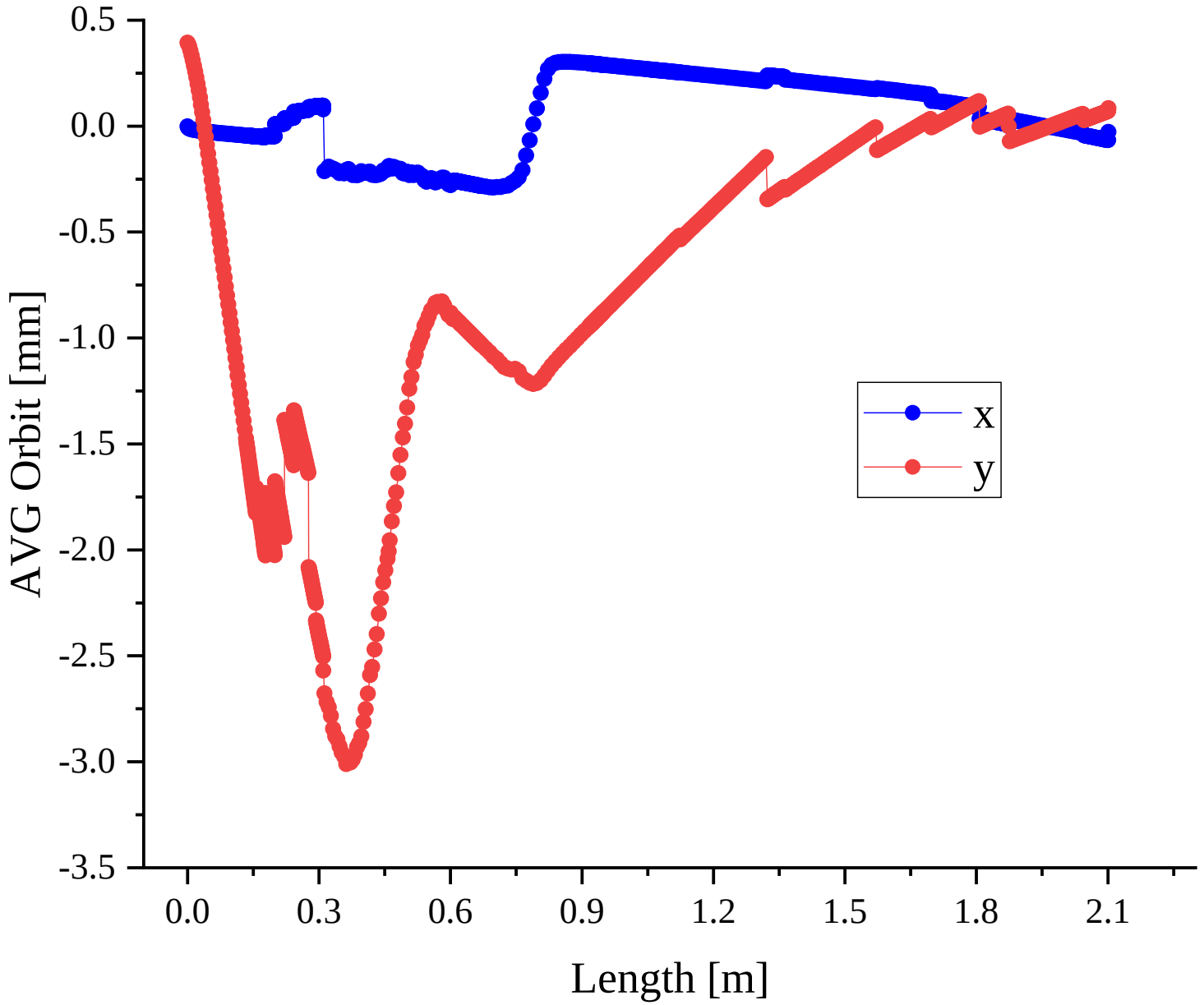




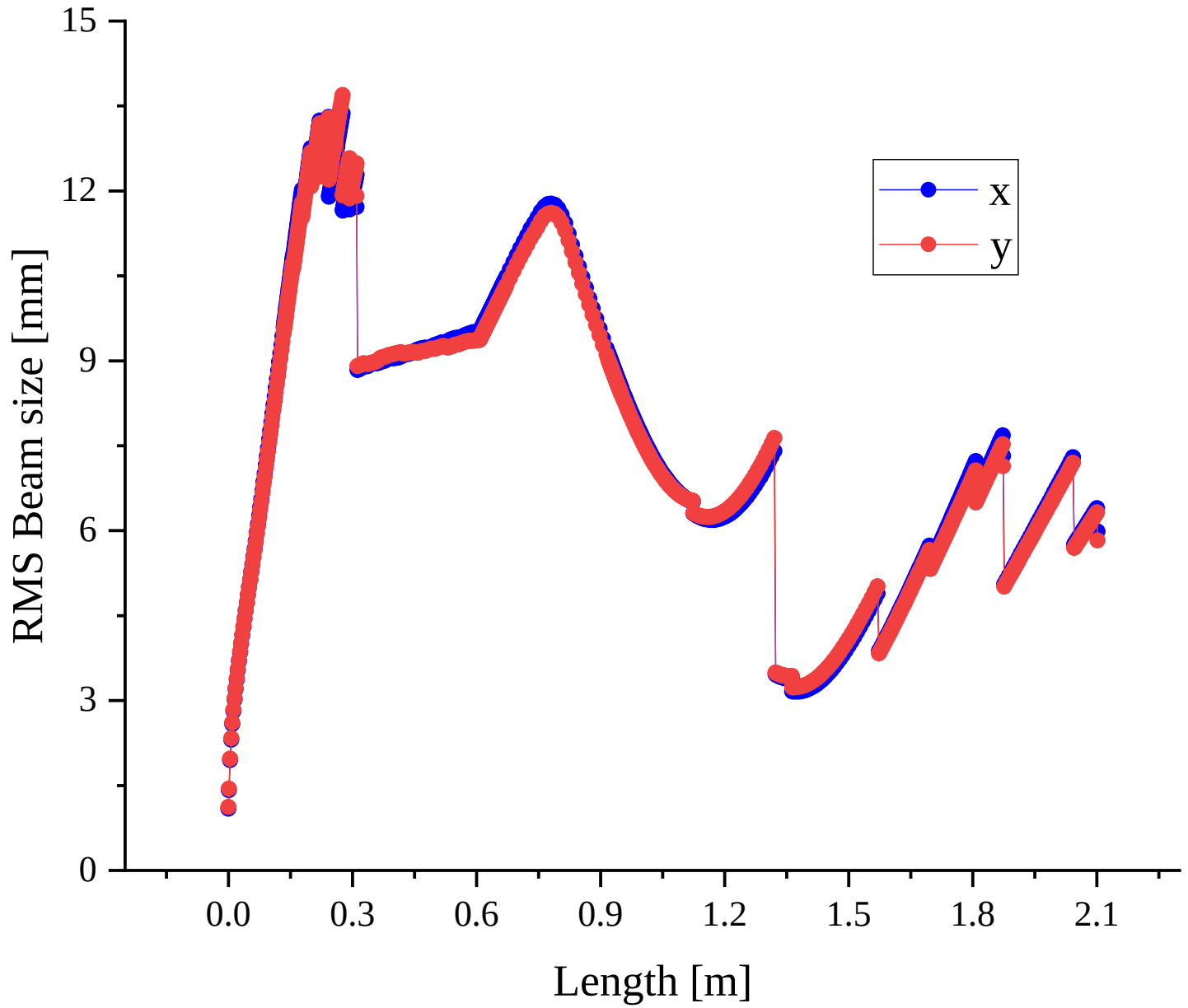
Particle losses in the beamline



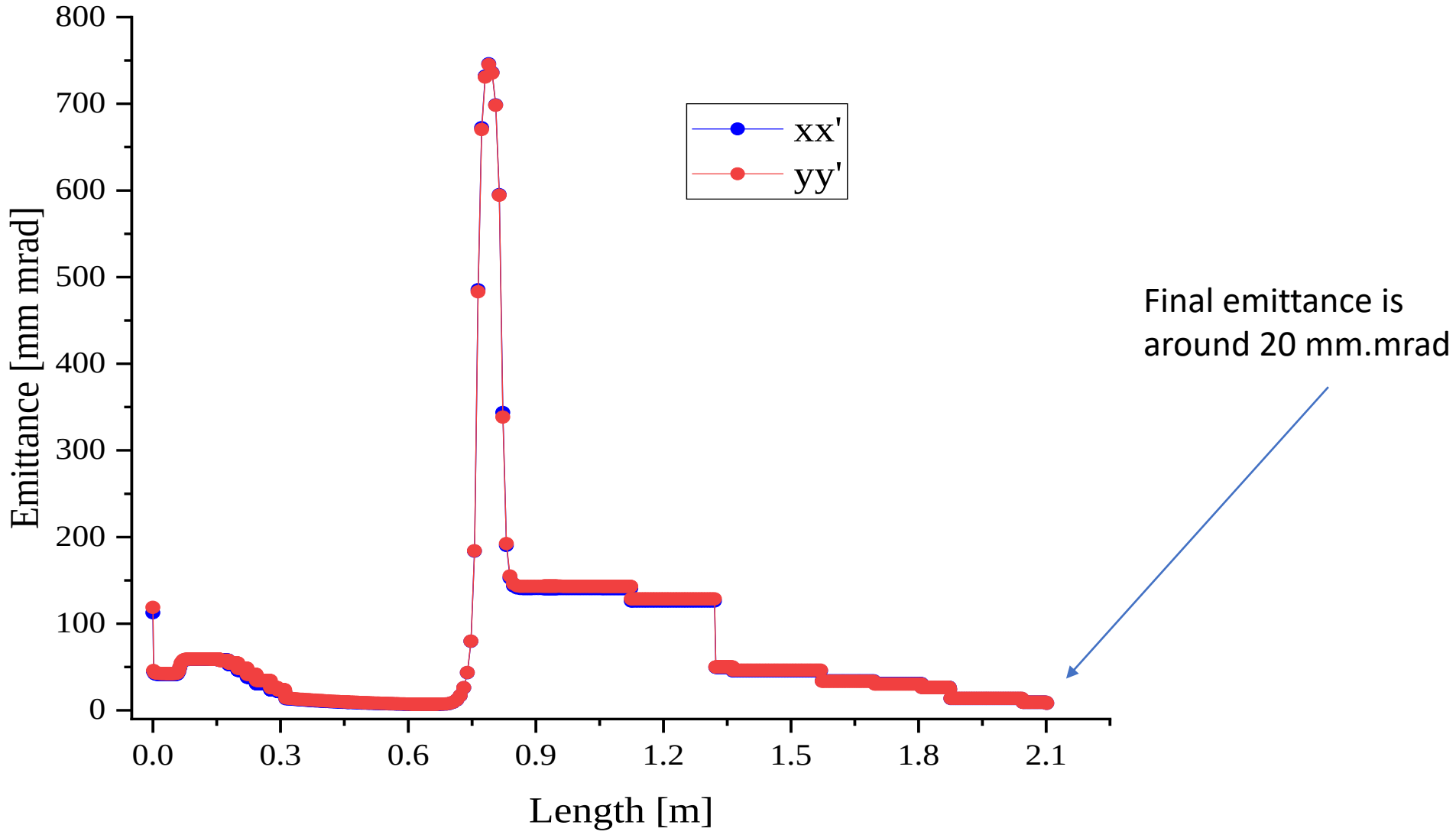
83 % of the electrons are loss



The secondary beam is centered in a similar way to the main beam



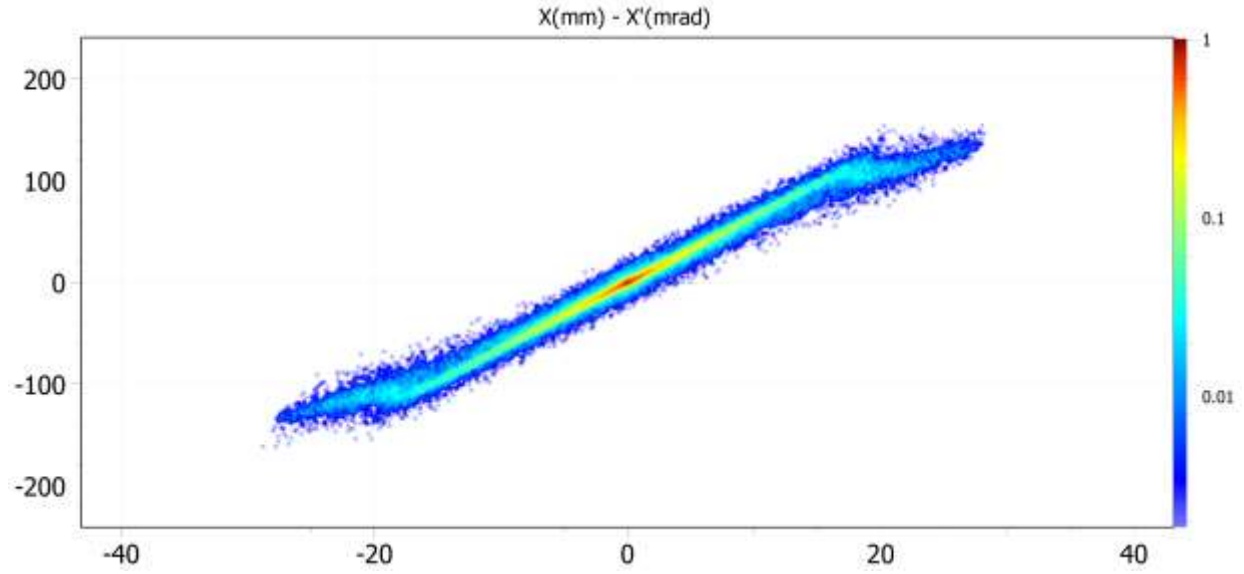
Beam size evolution

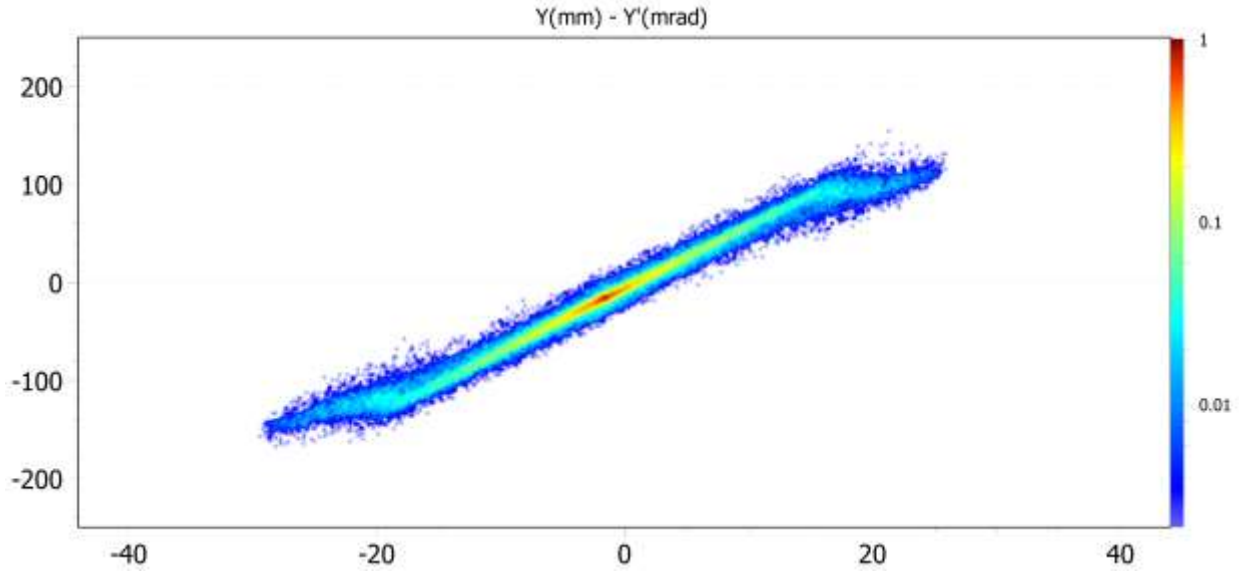


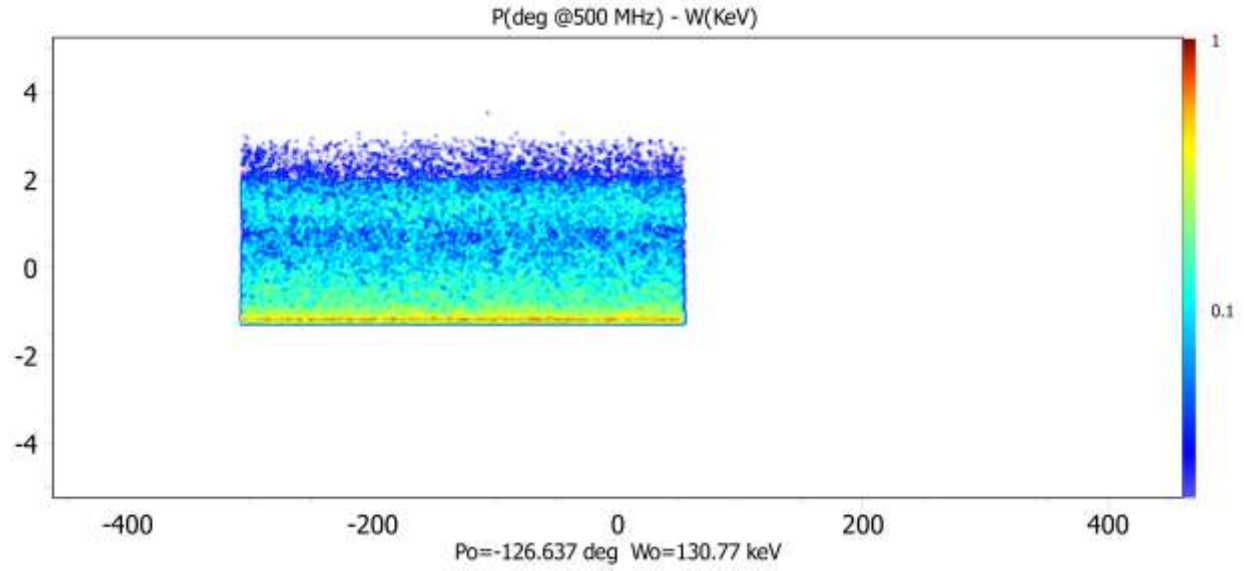
Final emittance is around 20 mm.mrad

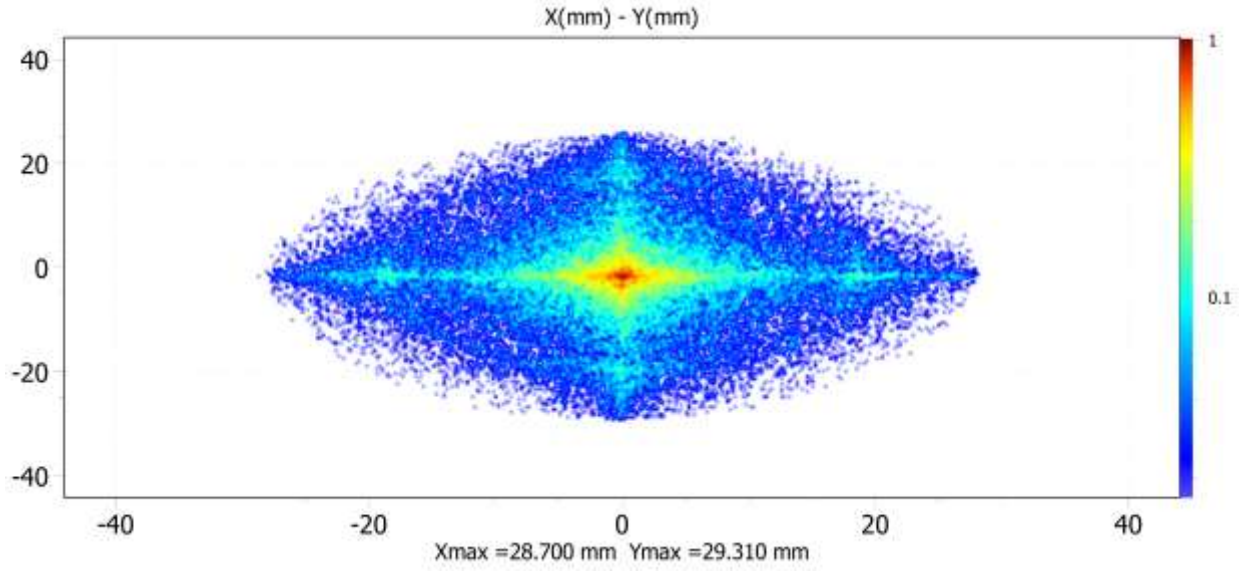
Secondary Beam profiles at different positions

After the acceleration z = 135 mm, 49 999 electrons

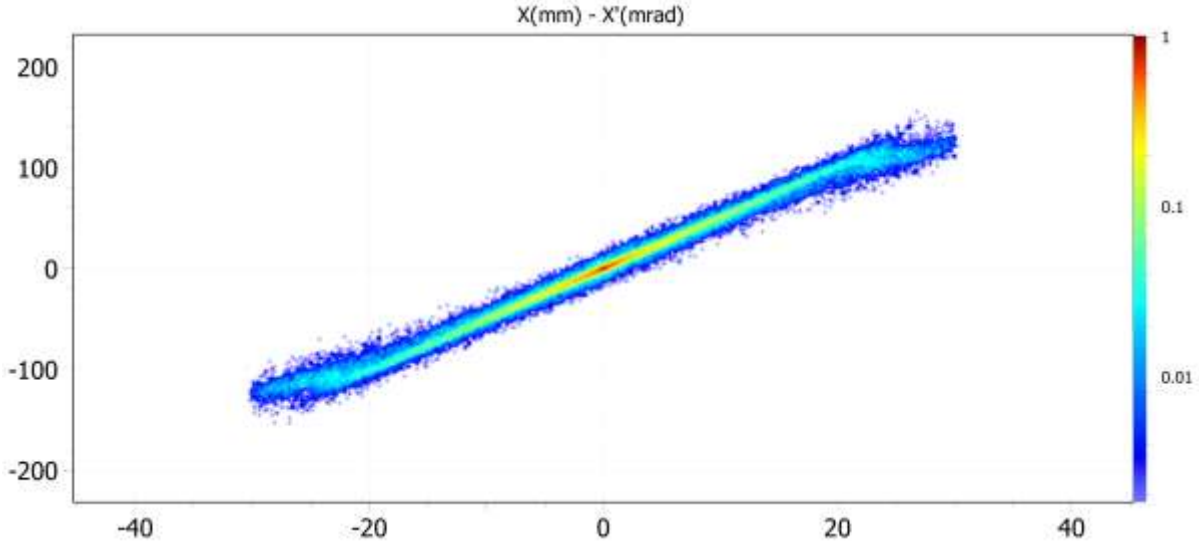


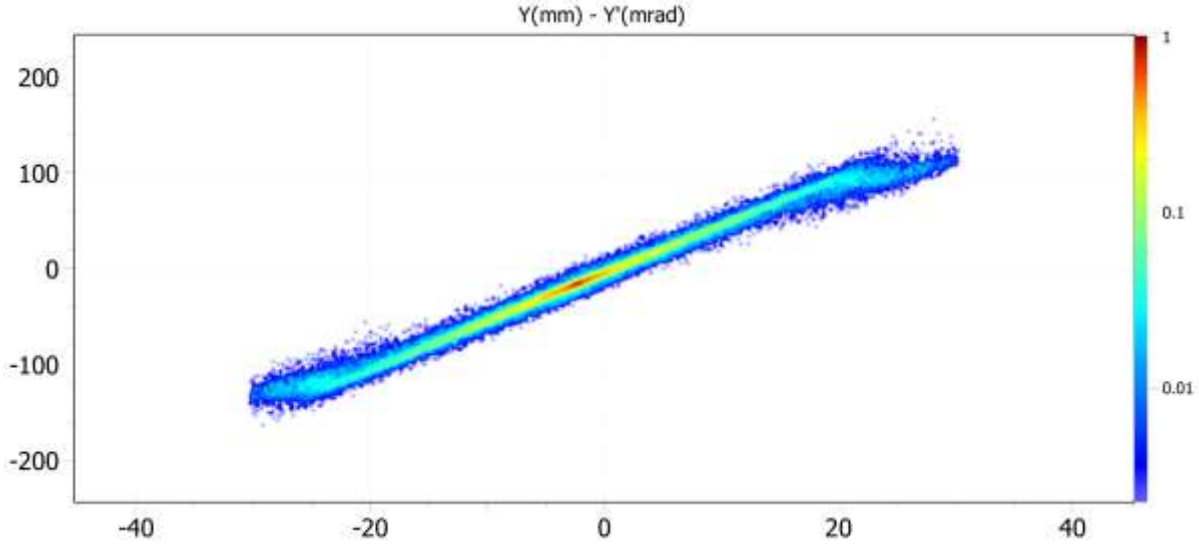


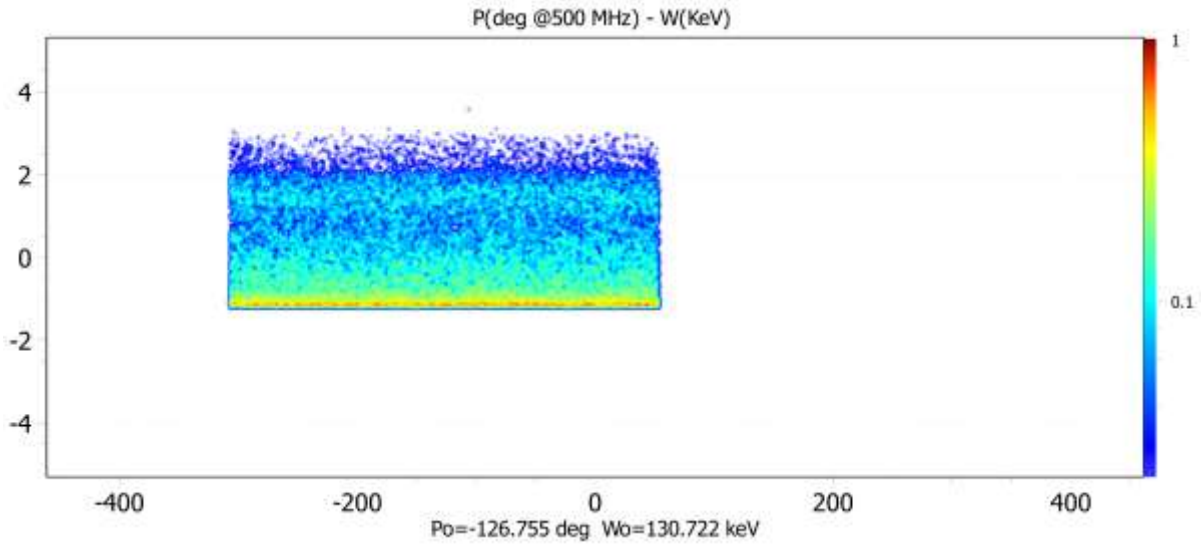


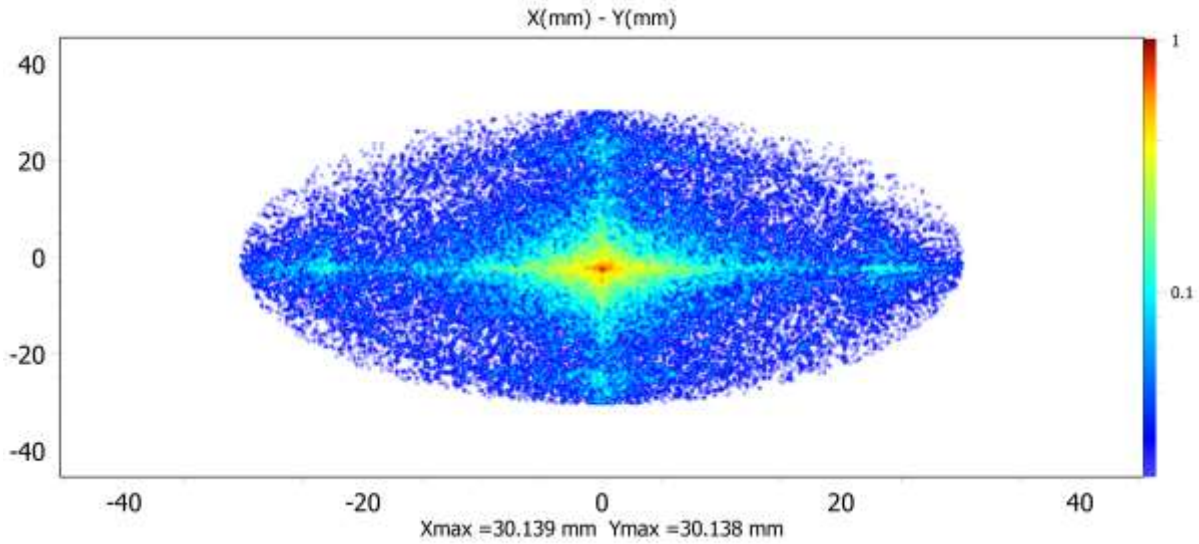


Z = 178 mm, 48 436 electrons

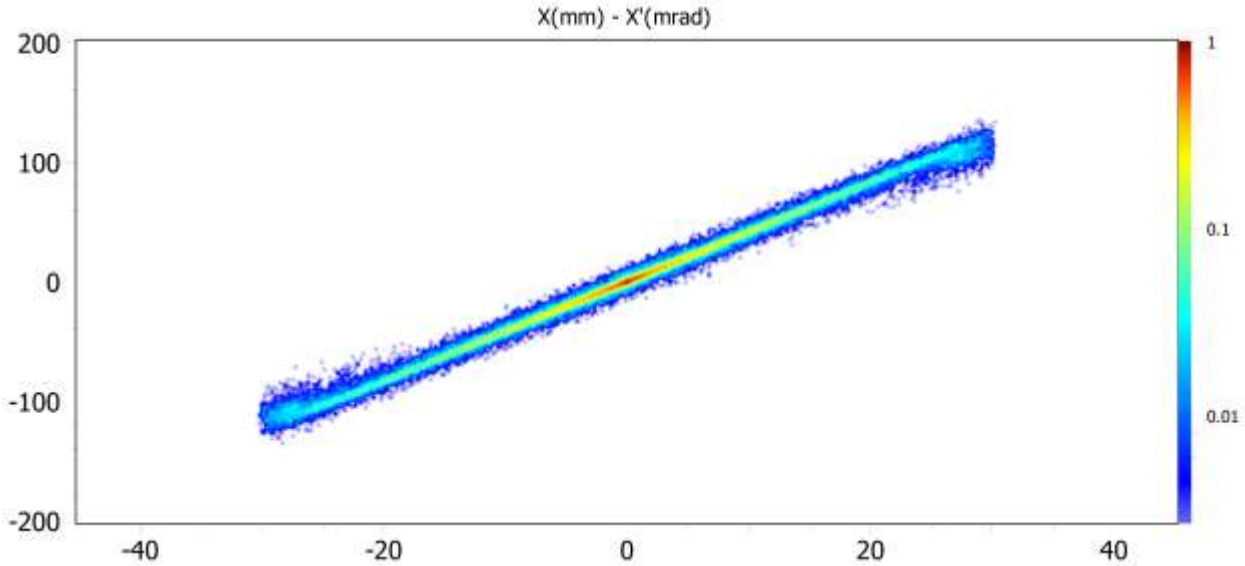


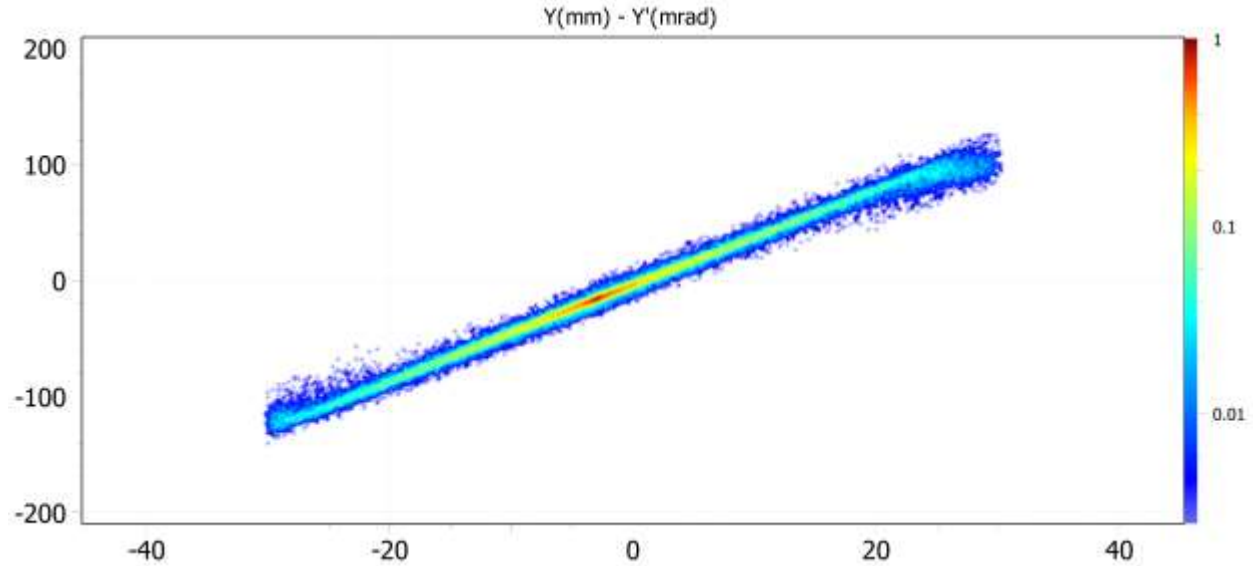


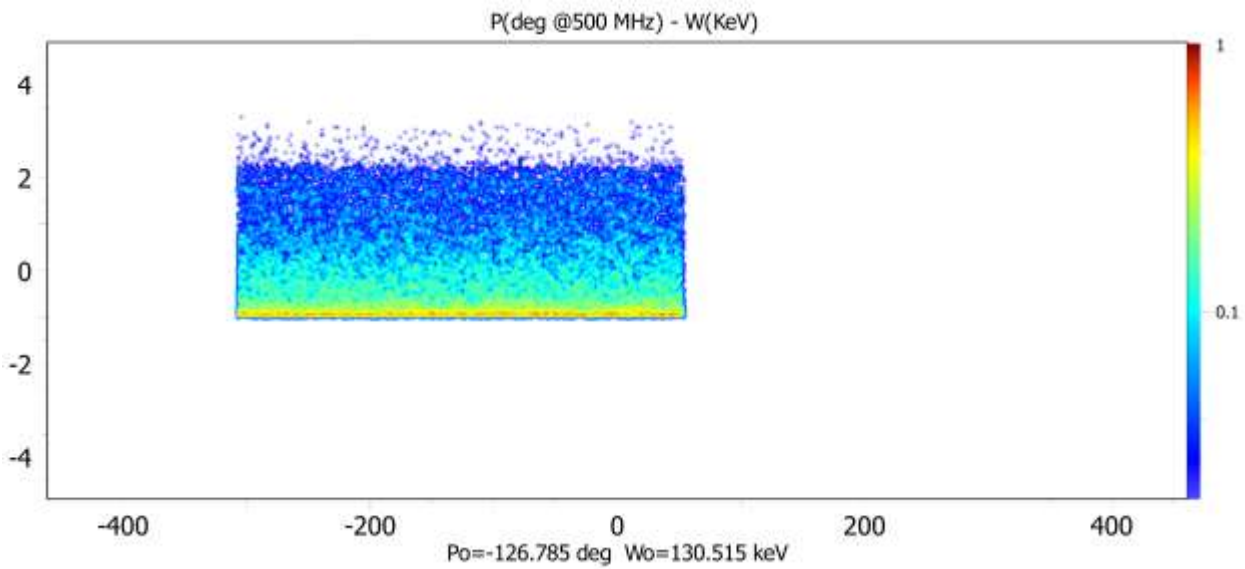


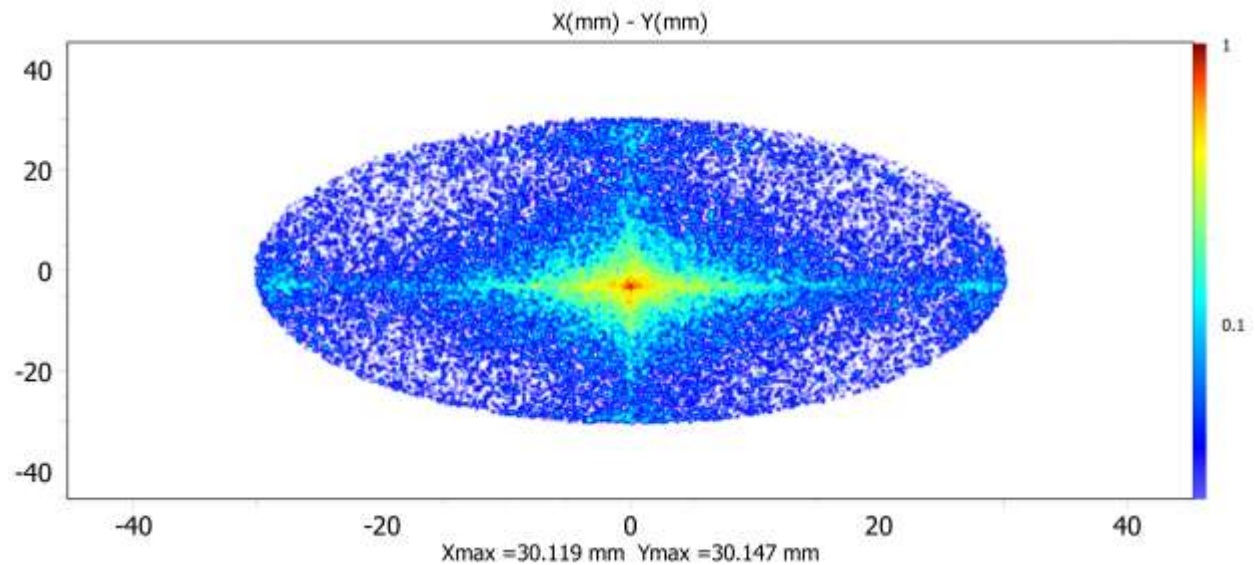


Z = 222 mm, 42 622 electrons

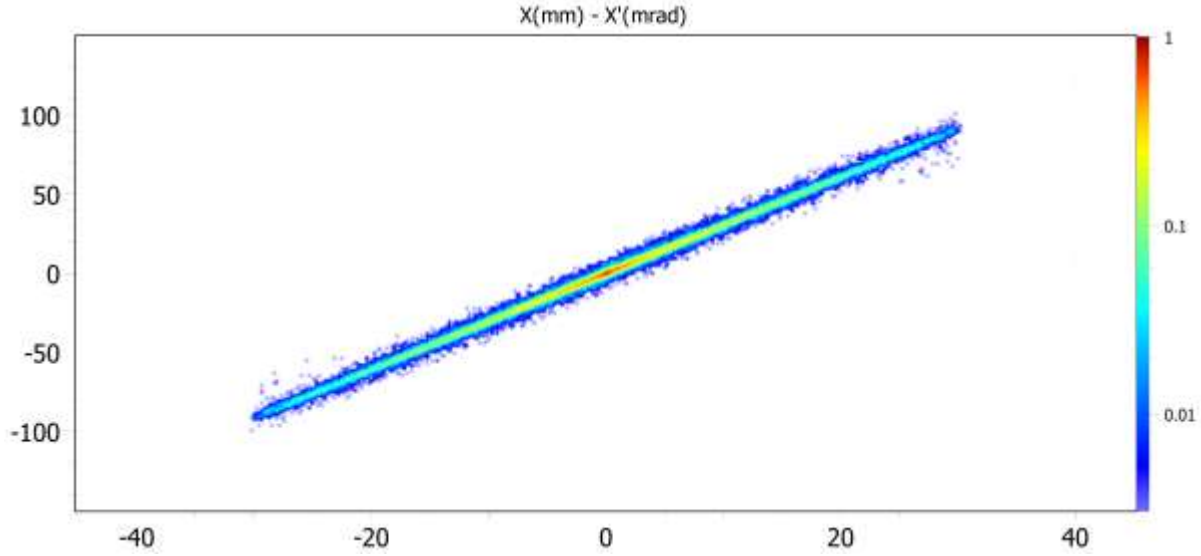


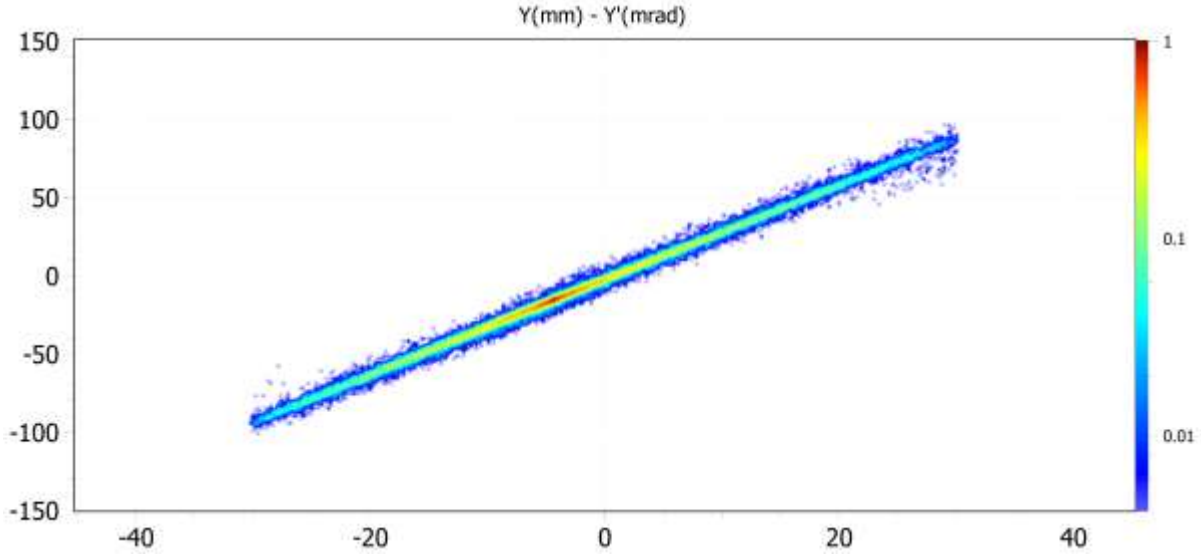


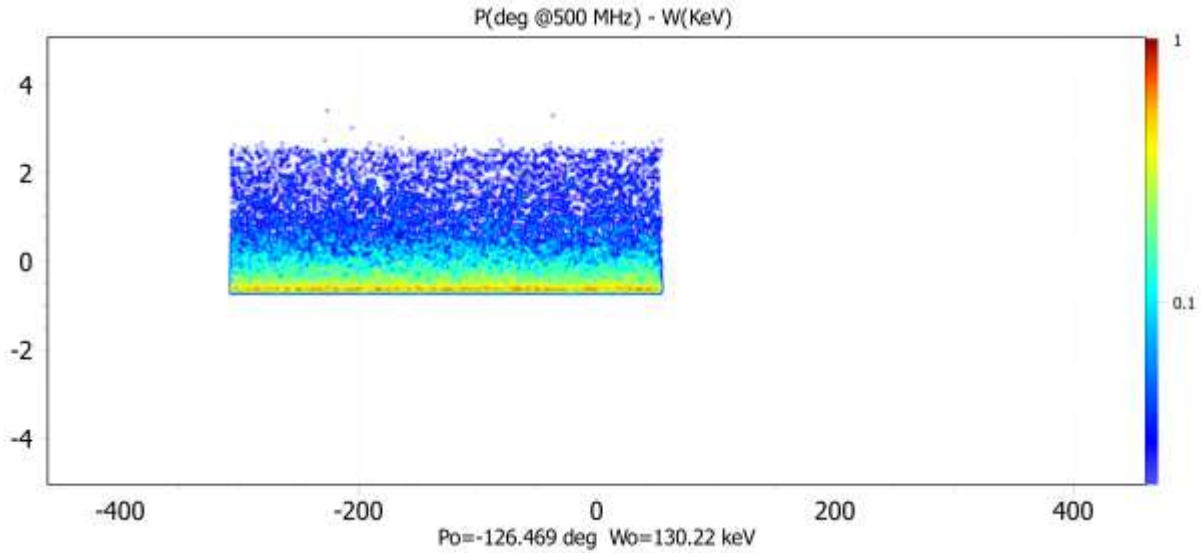


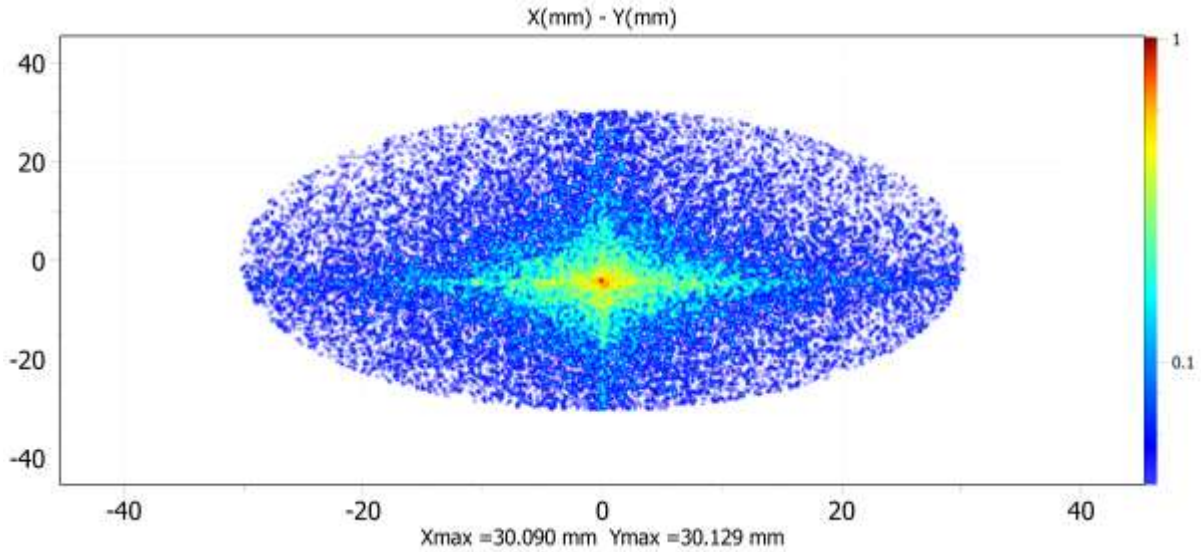


Z = 276 mm (before steerers), 31 089 electrons

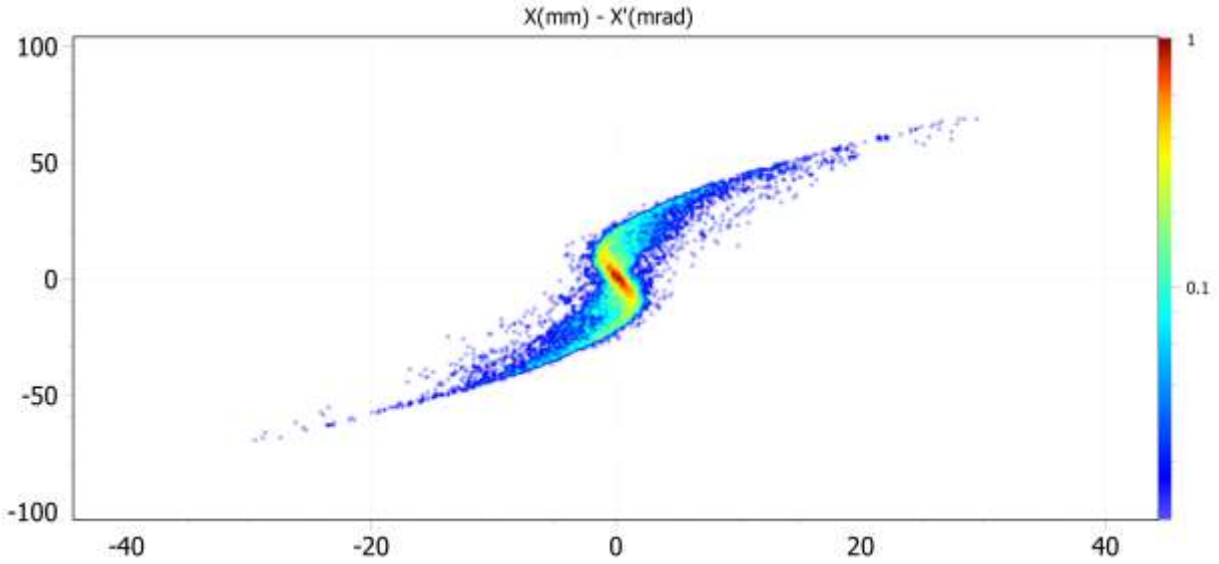


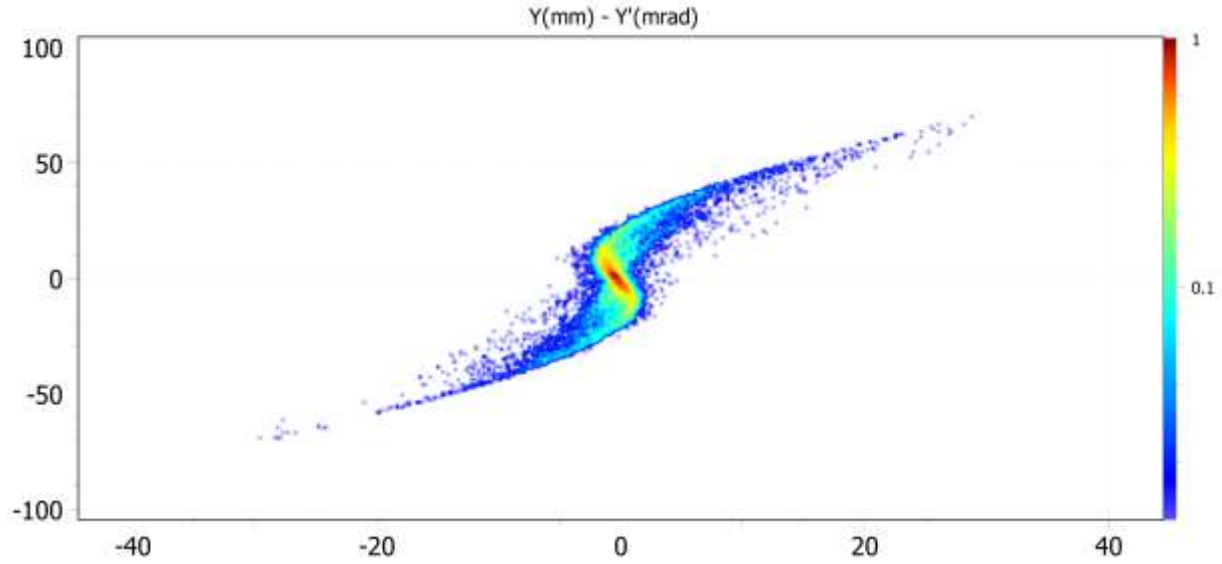


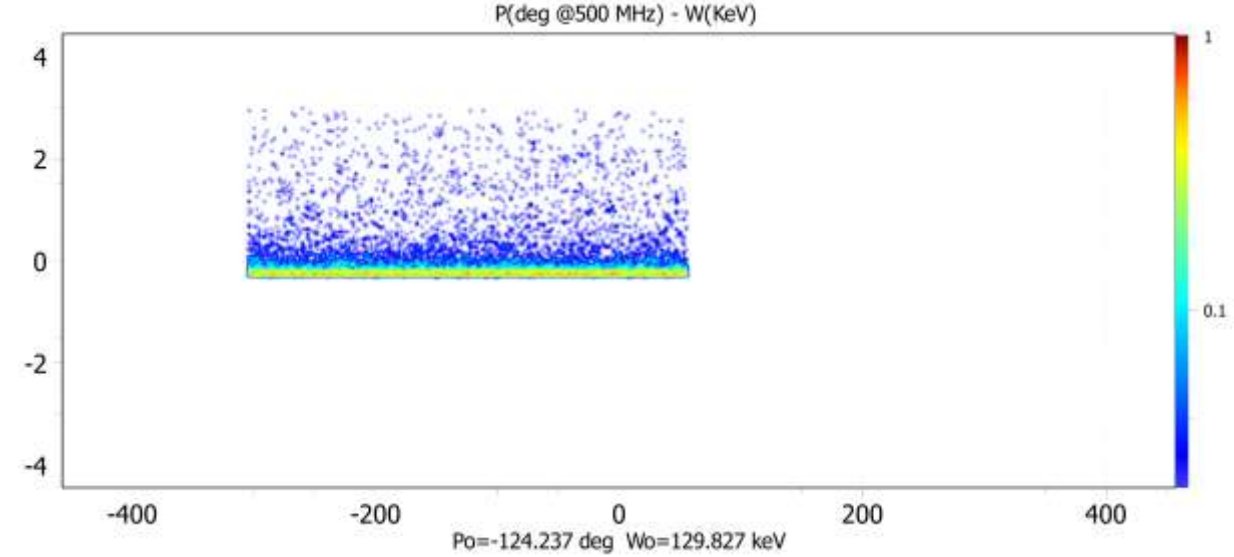


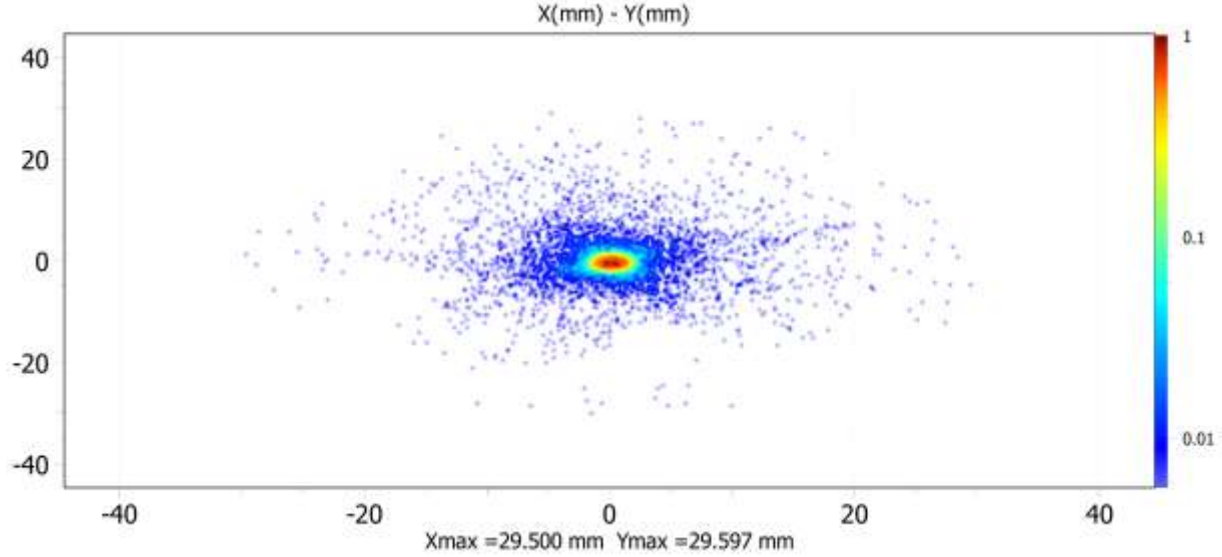


Viewer-ITV2I01 = 1540mm , 11 750 electrons









ITV1I02= 2100 mm (after dipole) , 8 480 electrons