

GPT simulations of e-injector

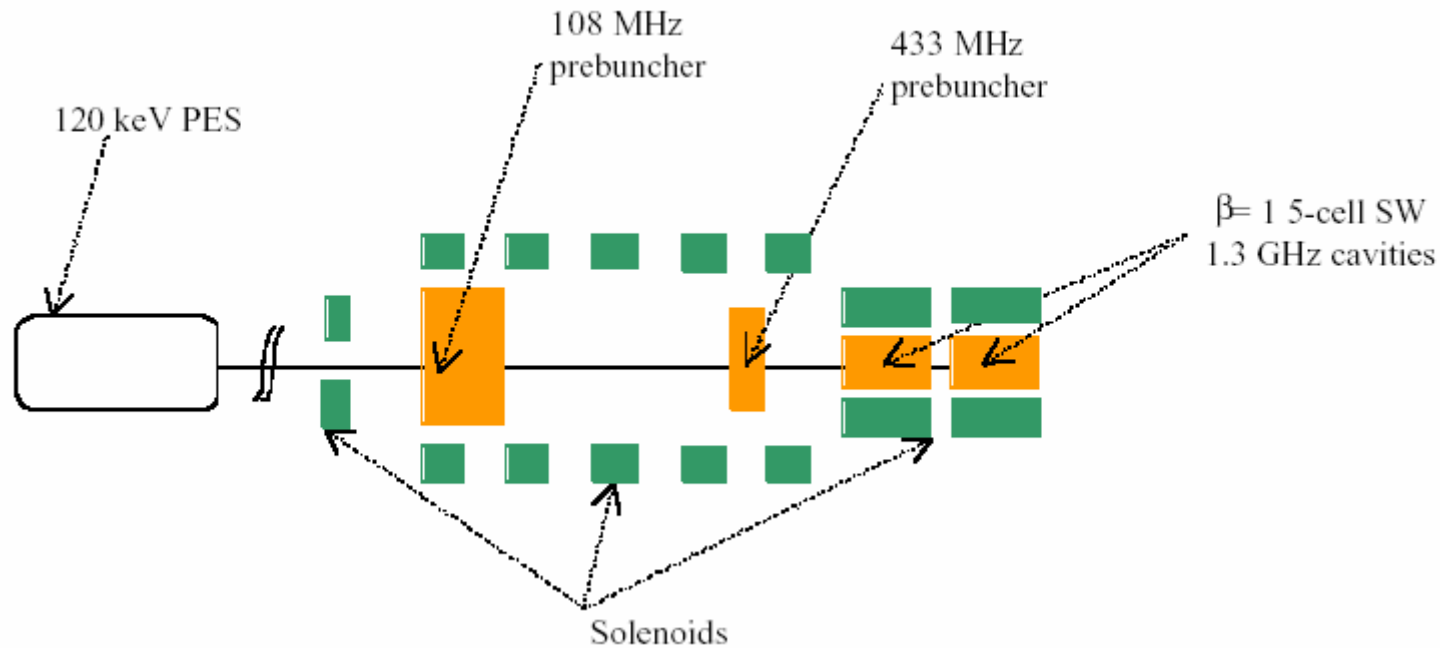
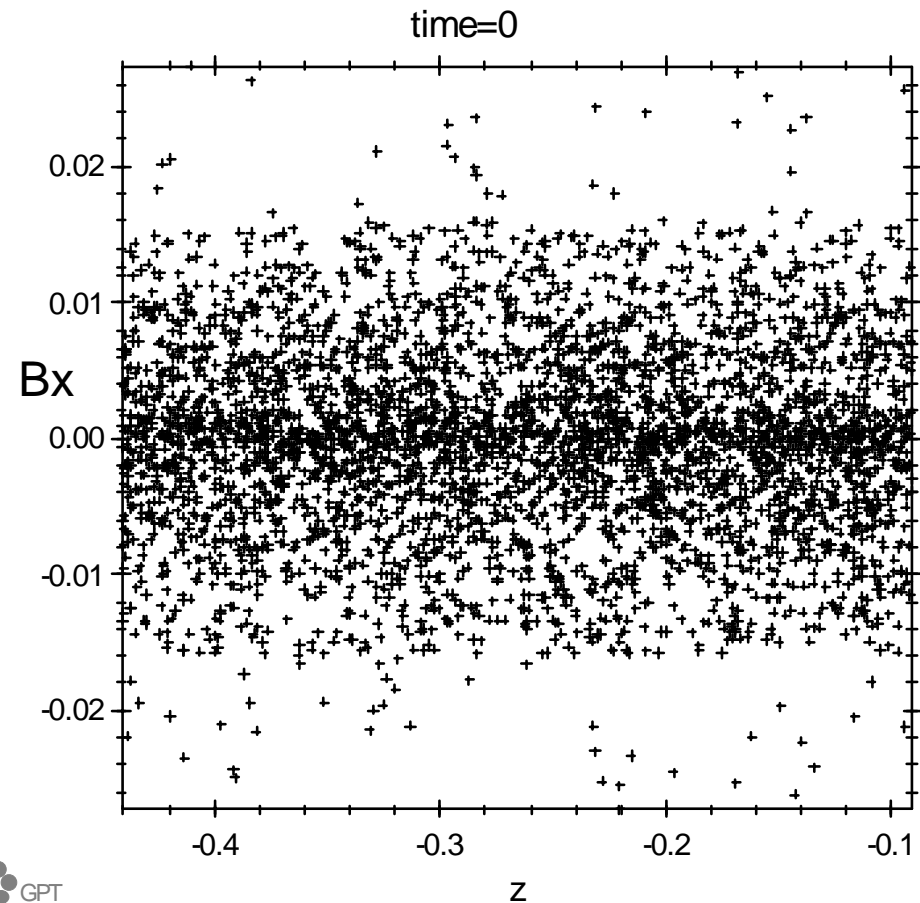
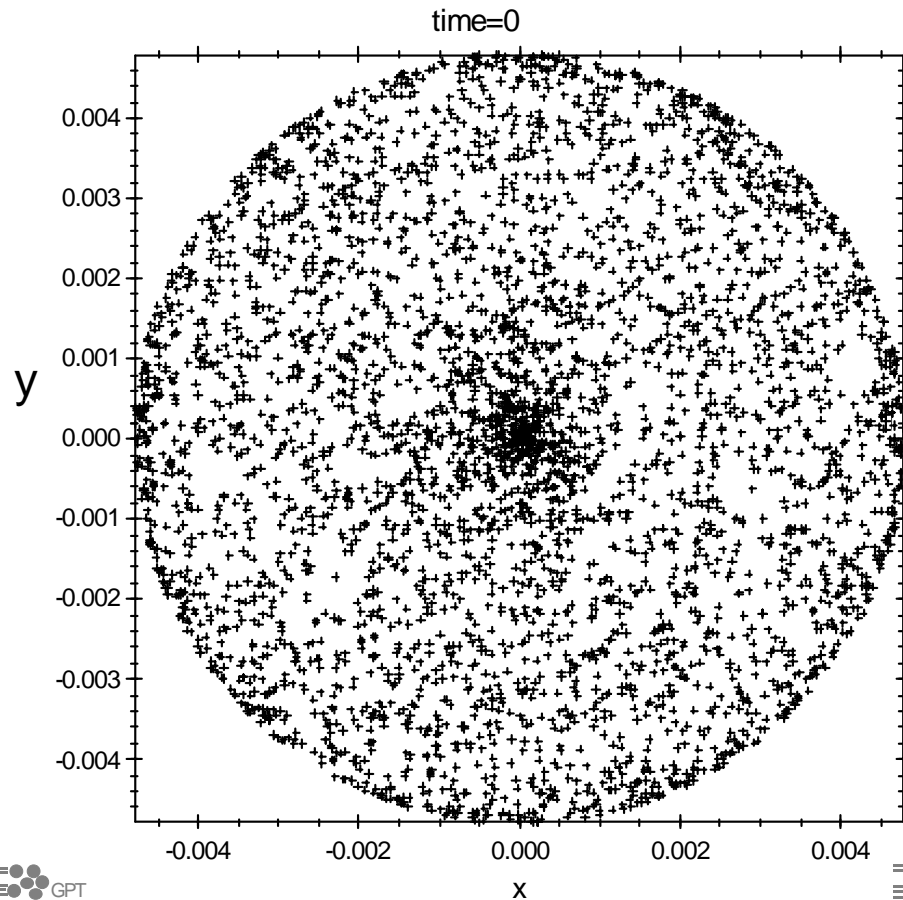


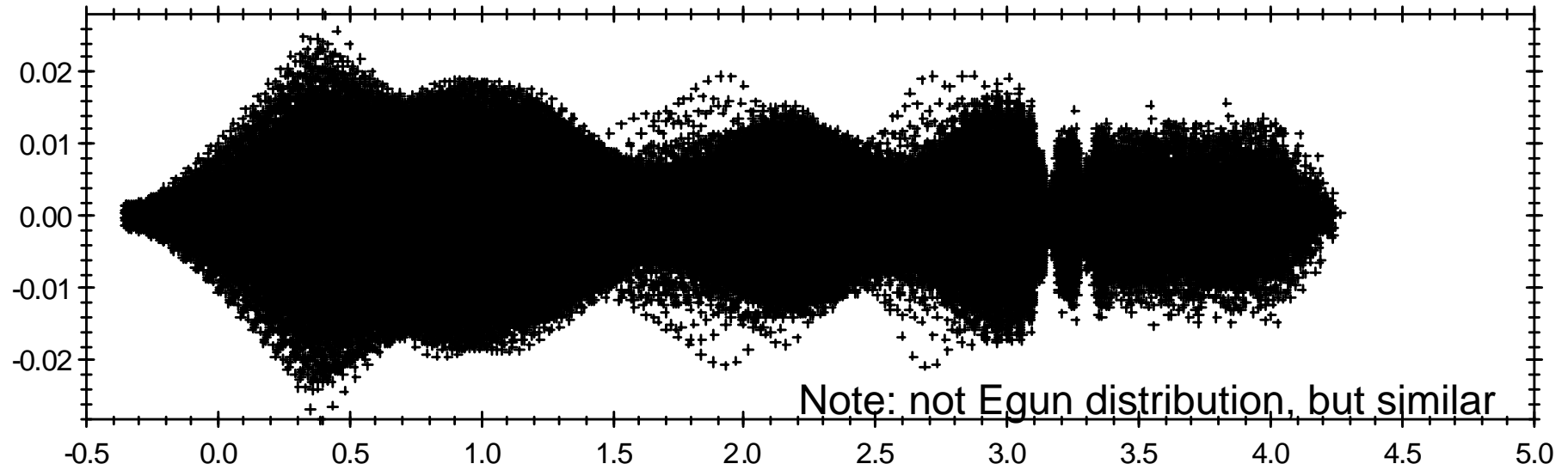
Diagram of low energy part of injector
(from TESLA paper by Curtoni and Jablonka)

Initial Particle Distribution

- Egun output manipulated using Excel, but could be implemented in C
- Random cylindrical phi angle added to get from line to disk
- Random z displacement added to make 2ns cylindrical pulse
- Emittance calculated using GPT agrees with Egun value to 20%

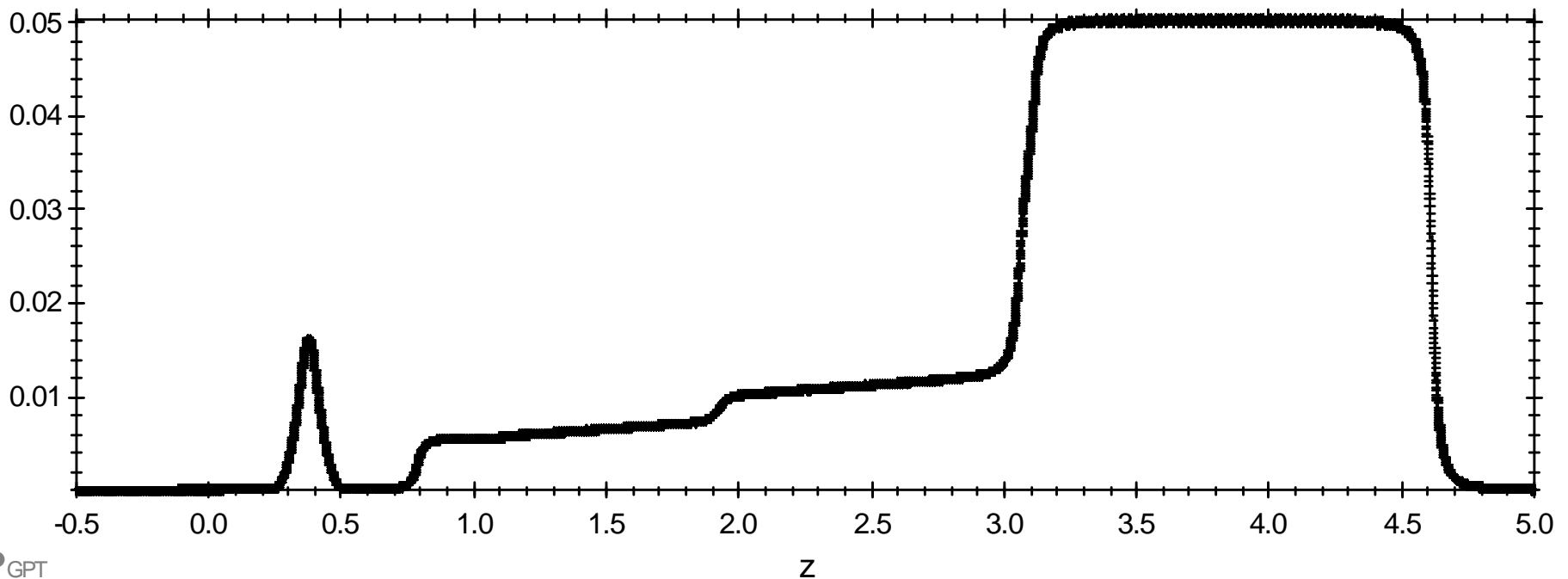


Combined plot of snapshots of bunch x-z plot



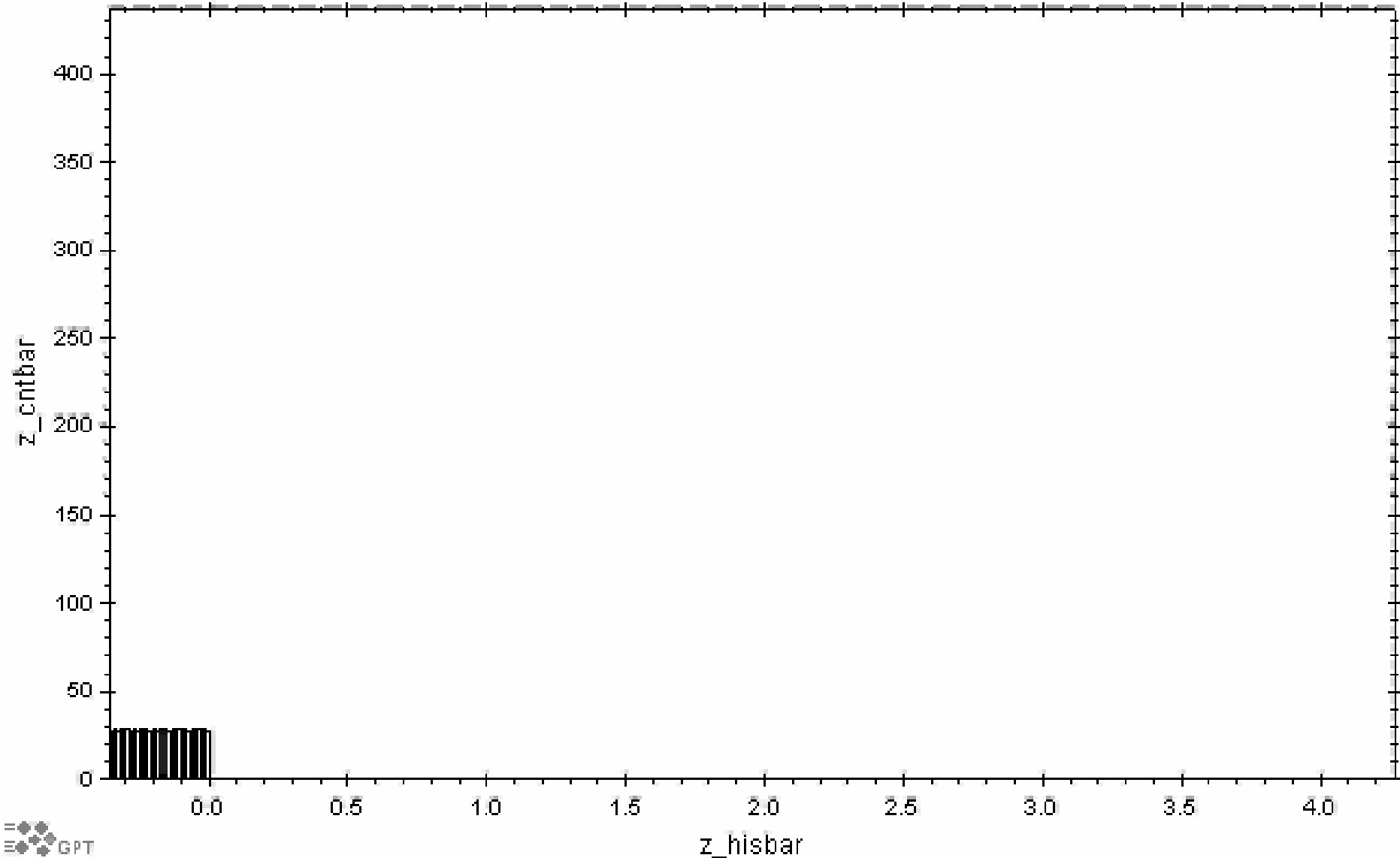
Axial solenoidal B-field

time=0
z



Histogram animation of e-bunch through pre-bunchers (108MHz@0.75m, 433MHz@2.77m)

time=0



L-band buncher problem

- 5 cell $b=1$ structure, but $b=0.58$, so unable to bunch and accelerate as needed
- hit in first quarter wavelength, which either bunches and decelerates, or spreads and accelerates bunch
- first cell phase was decoupled in Parmela simulations, which is feasible if that cell is separated from the others, but further work is needed

