Cavel Tracking in Open Cavities

R. B. Palmer, Rick fernow, Juan Gallardo (BNL)

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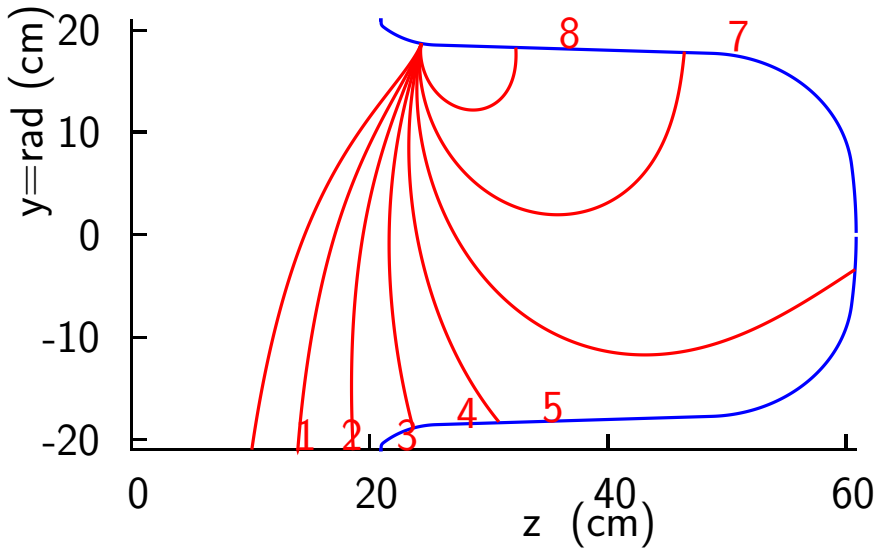
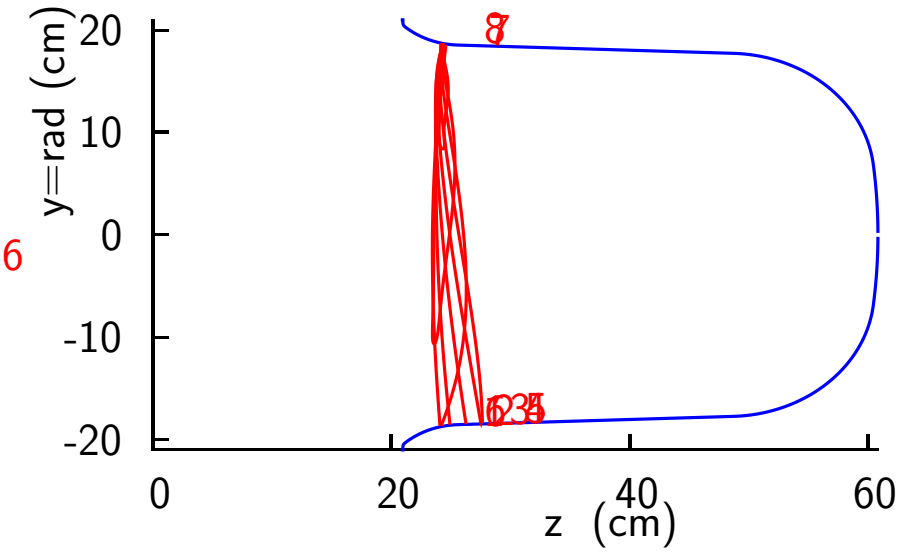
Assumptions

- Using Fernow's CAVEL version 1.3
- Mu Cool 201 MHz cavity
- Axial maximum field 15 MV/m
- Start electrons on a maximum gradient point
- use differing axial magnetic fields

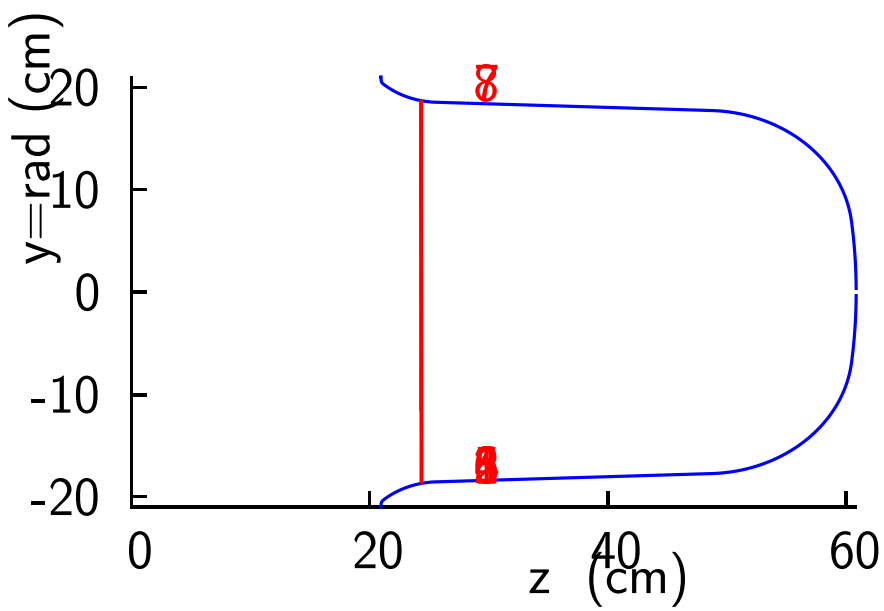
Tracks at different phases



B=0

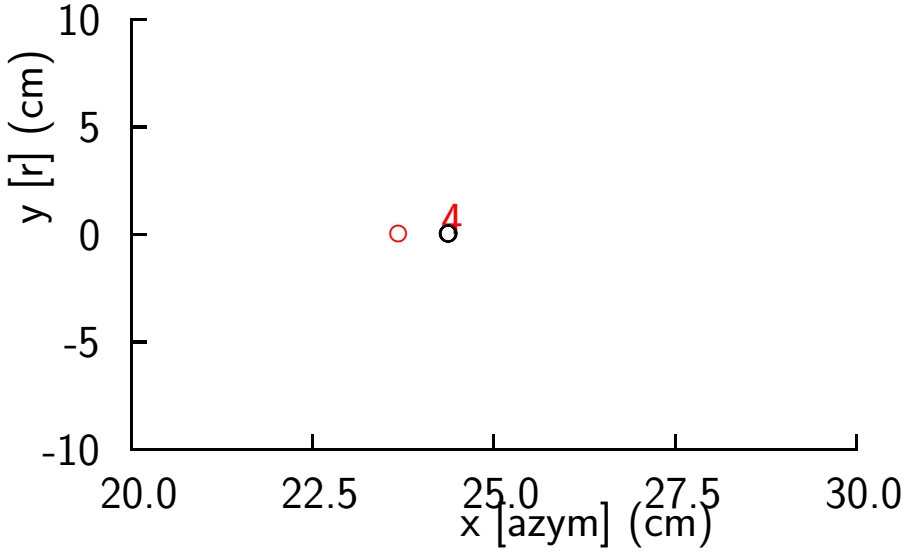


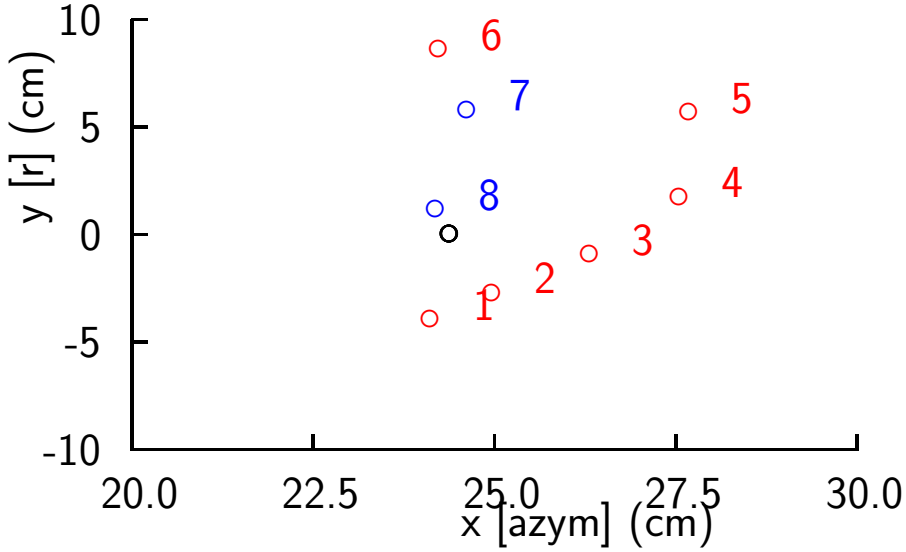
B=0.1 (T)



B=1 (T)

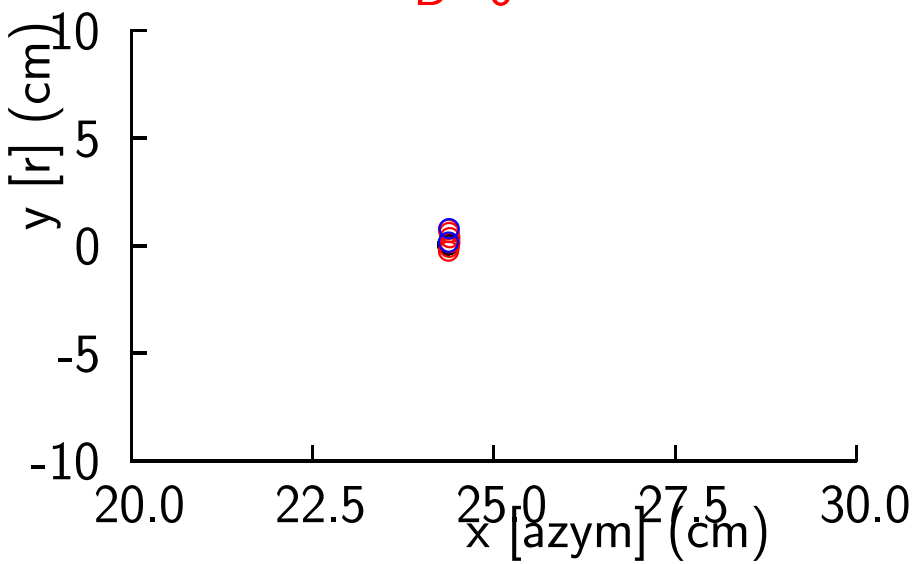
Arival Points at different phases





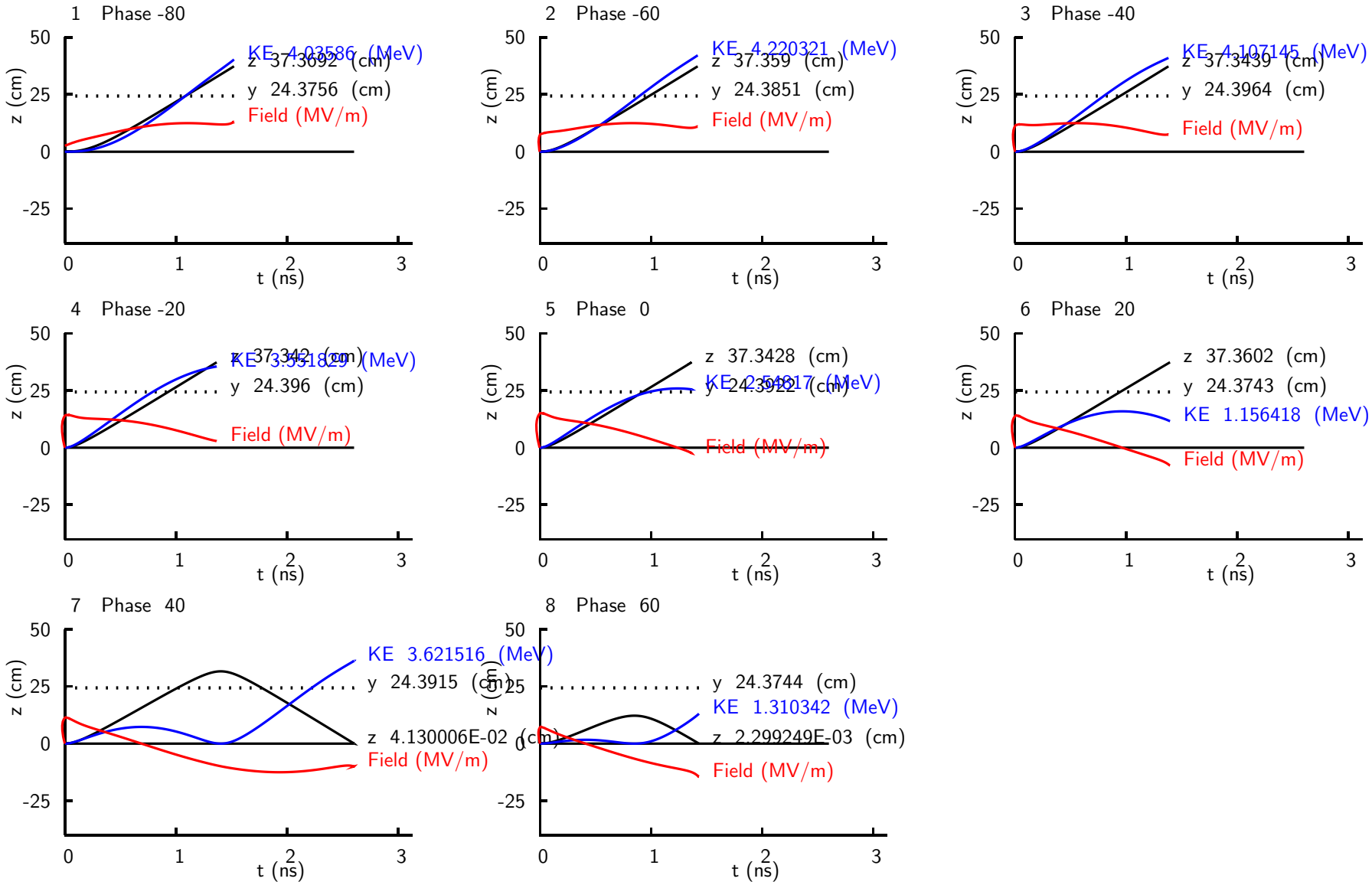
B=0

B=0.1 (T)

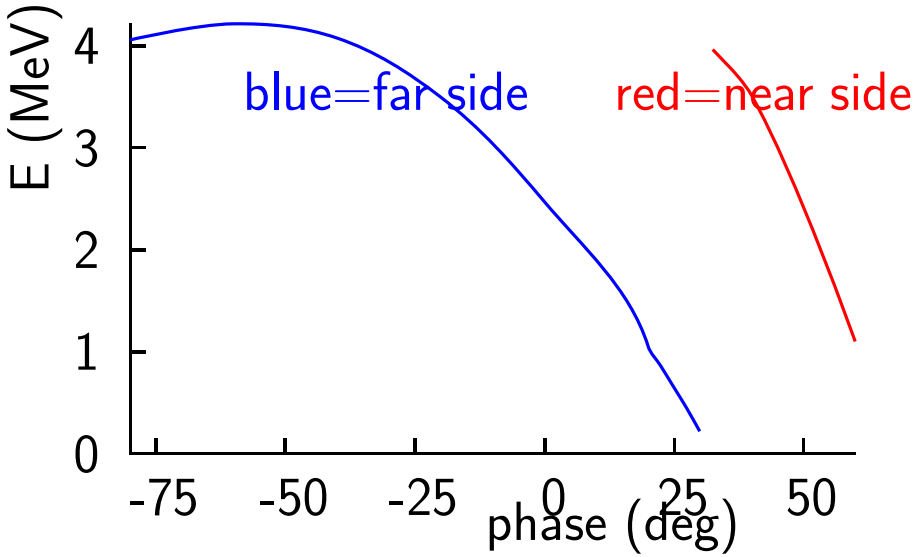


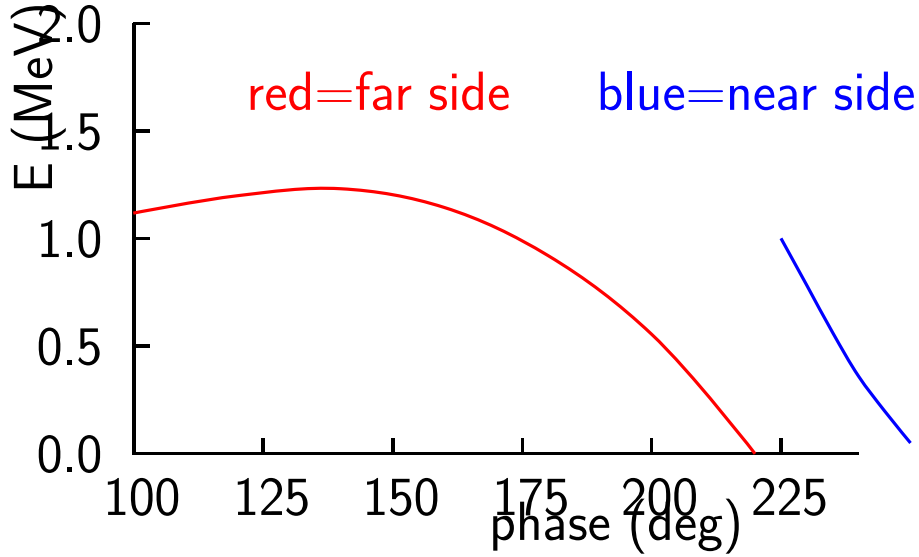
B=1 (T)

Parameters vs. Time



Electron Energy vs Phase





Range energy

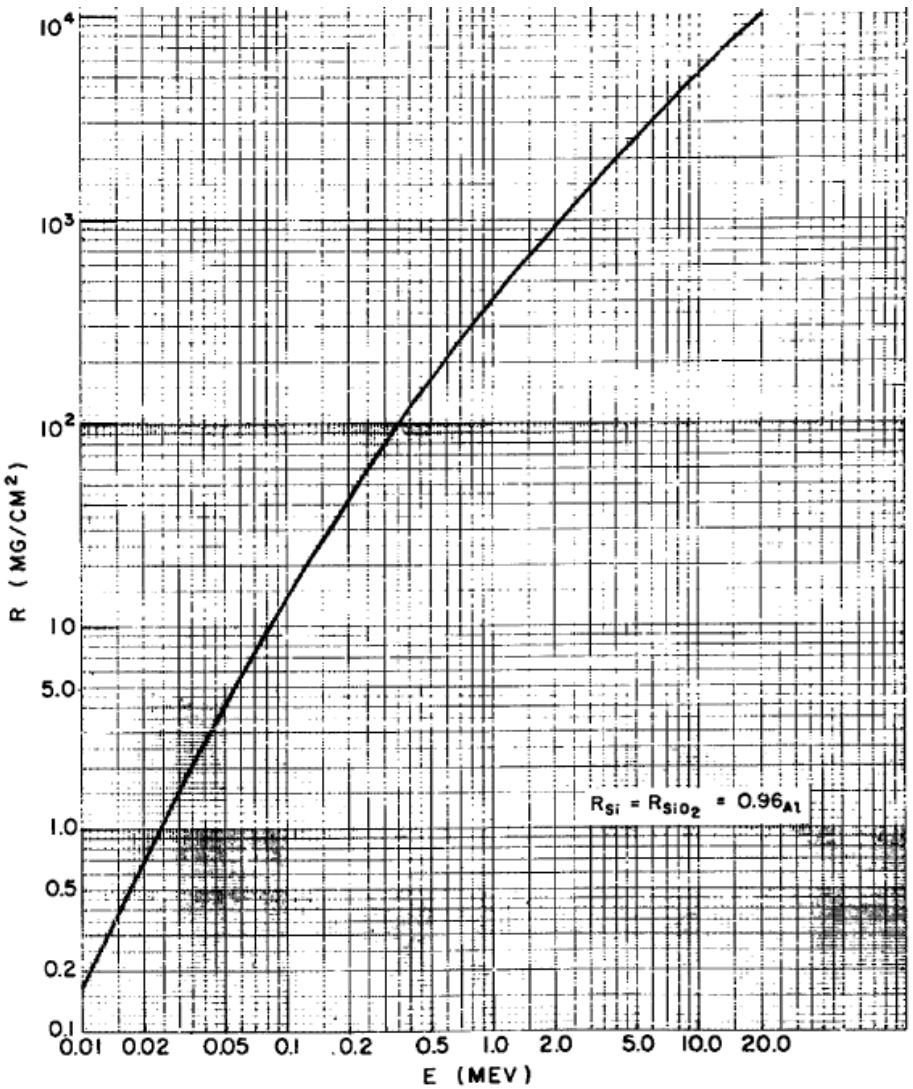


Fig. 5 - Range-energy relationship for electrons in aluminum (from Ref. 9)

For Cu density 9 and ignoring Al vs. Cu effects:

e Energy MeV	range mm
0.25	0.05
.5	0.19
1	0.44
4	2.2

Thermal difusion depth for Cu and $\tau = 200\mu\ sec$

$$\delta = \sqrt{\frac{2k\tau}{C_v}} = \sqrt{\frac{2\ 4.01\ 200\ 10^{-6}}{3.45}}$$

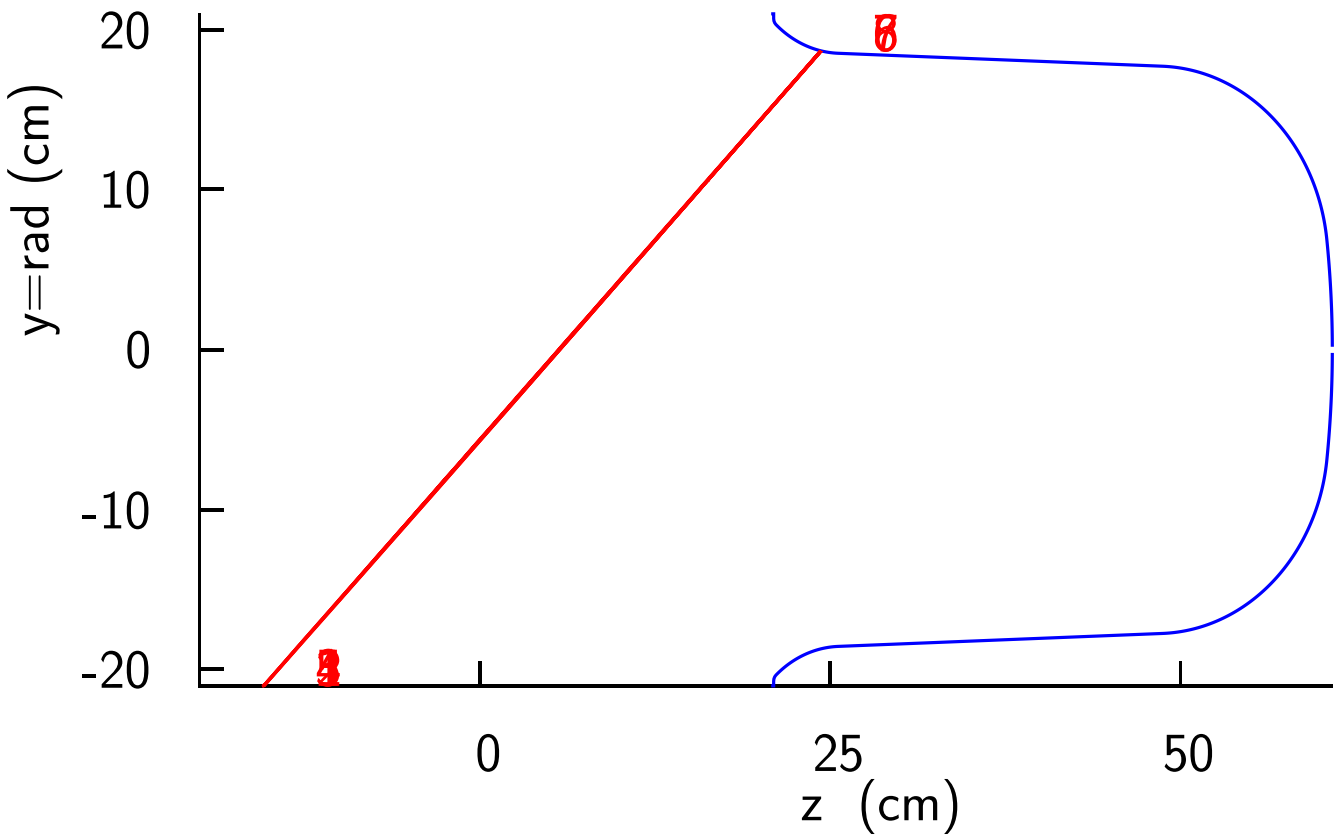
$$= 0.2\ \ (mm) \quad \text{for 201 MHz}$$

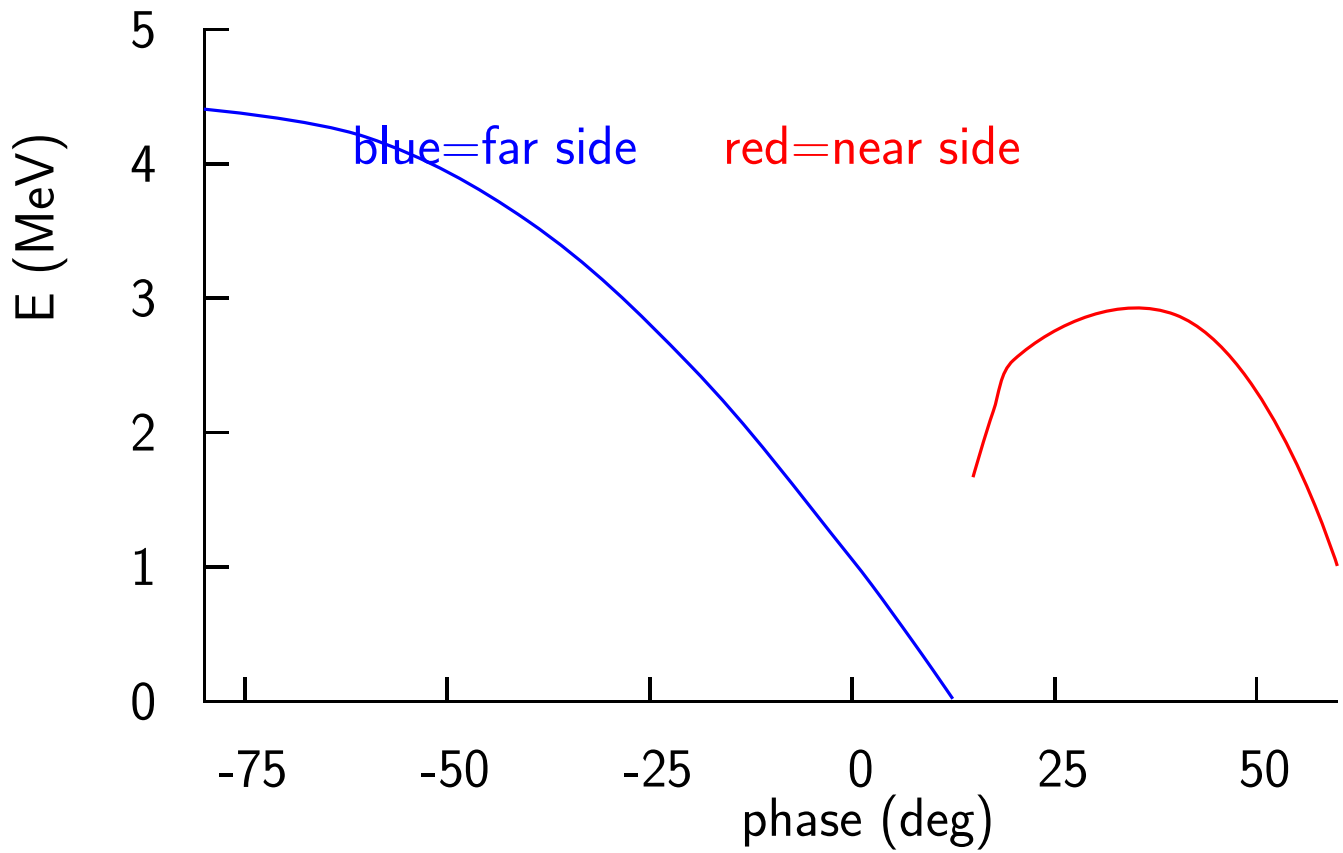
$$= 0.07\ \ (mm) \quad \text{for 805 MHz}$$

So energies $\approx$ .5 MeV bad at 201 MHz

So energies $\approx$ .3 MeV bad at 805 MHz

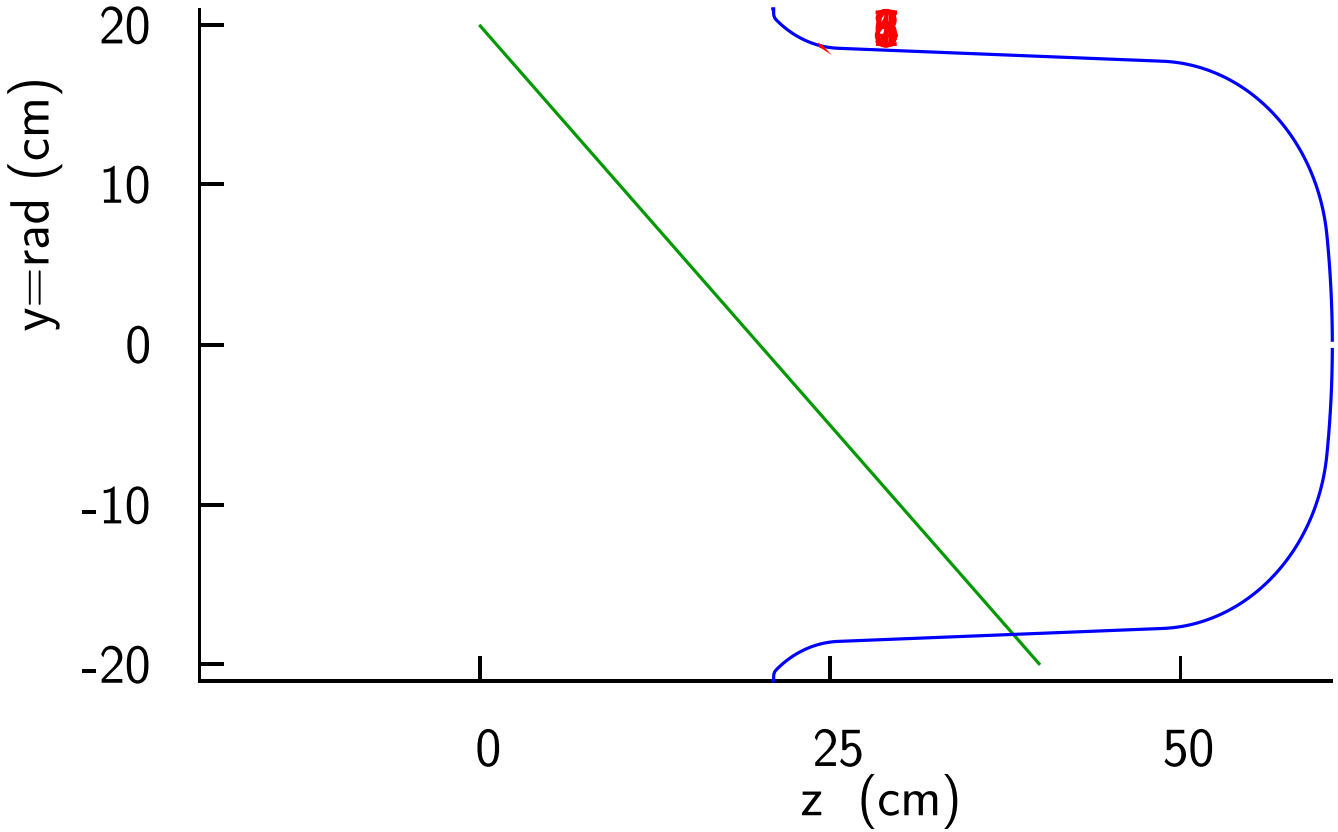
B at -45 degrees

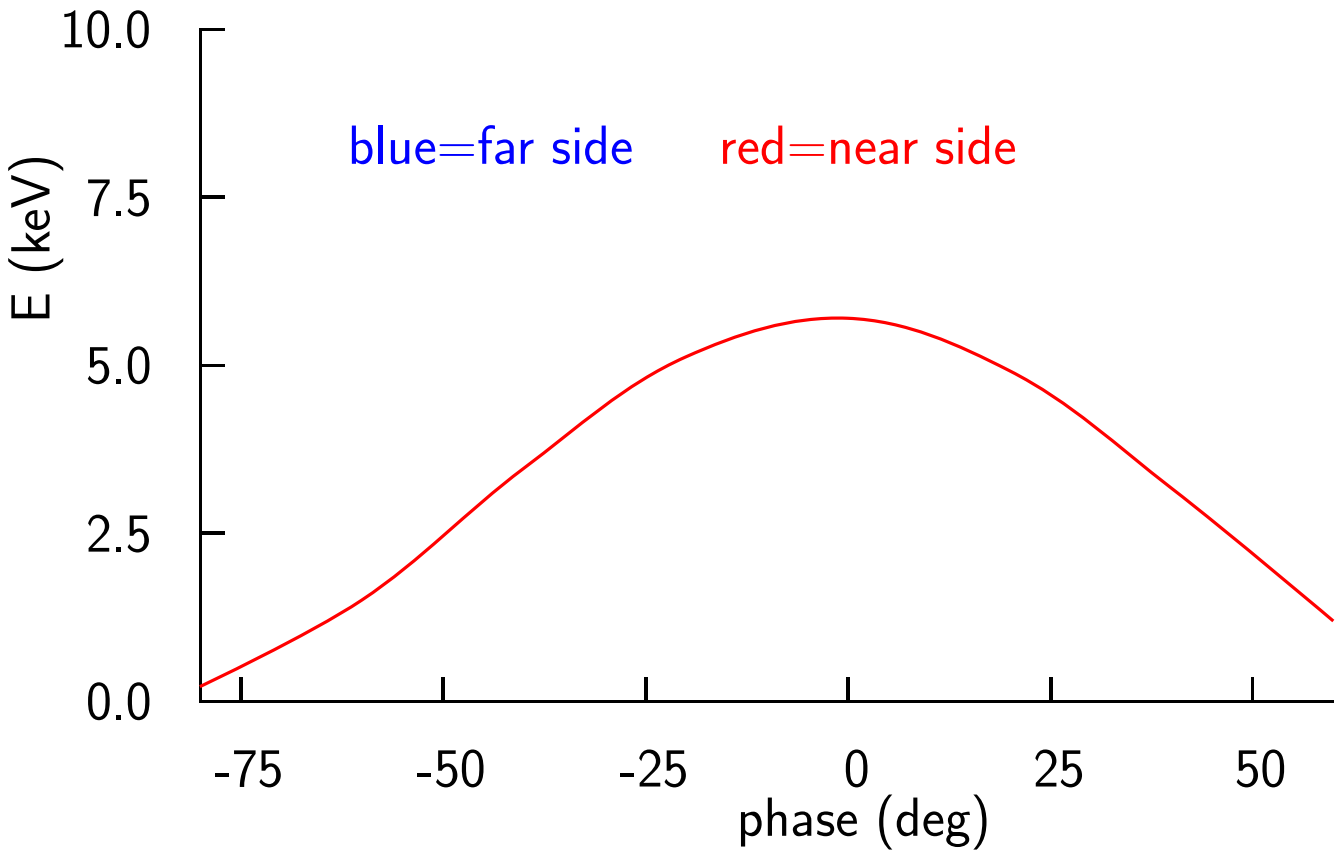




Similar to axial field

B at +45 degrees





KeV instead of MeV