Reoptimising Front End with proton absorber

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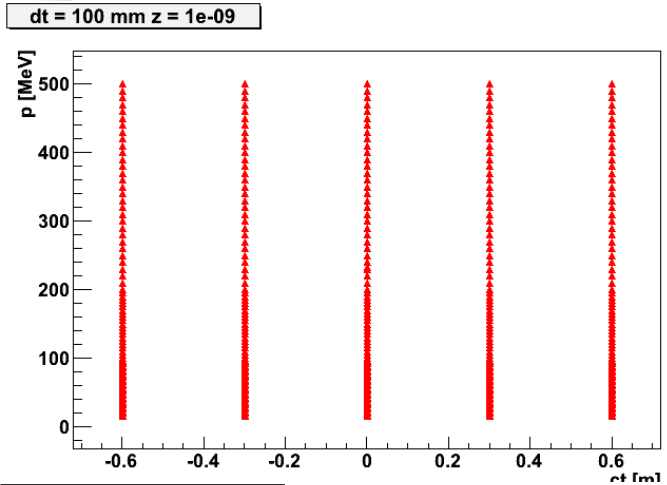
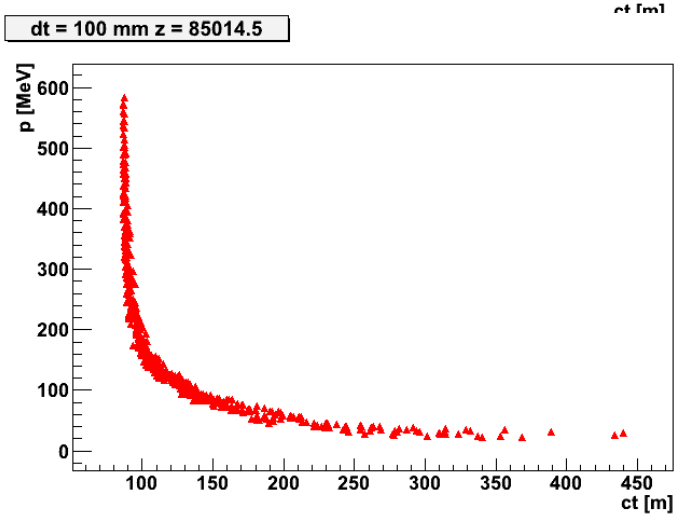
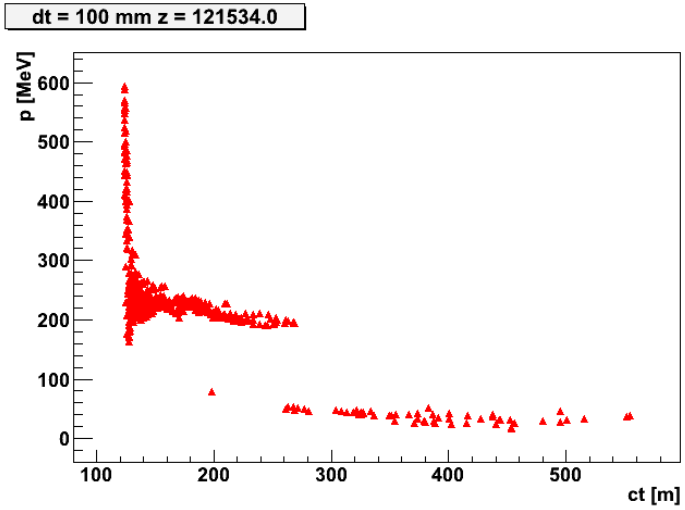
Proton absorber integration

- Adding a proton absorber skews the energy-time distribution of the outgoing muon beam
- Hope that adding a drift space would let it re-align
- That doesn't work
- Need to re-optimise the buncher and phase rotation to cope
- Prefer to work in g4beamline
  - Chicane is in g4beamline
- Need to develop optimisation routine
  - Make optimisation wrapper around g4bl
  - First check for straight lattice

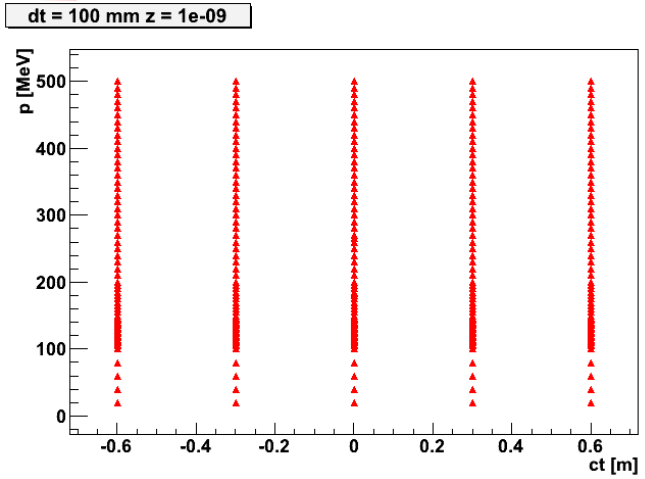
Toy beam – 0 mm Be

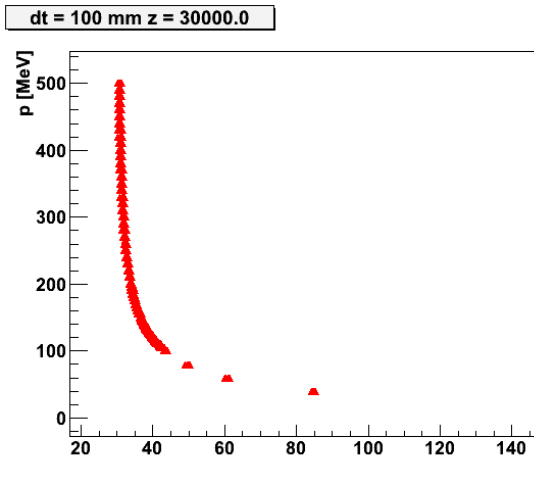


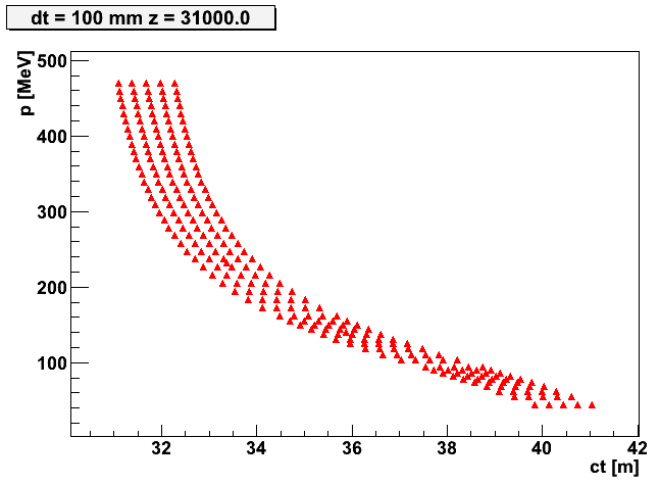


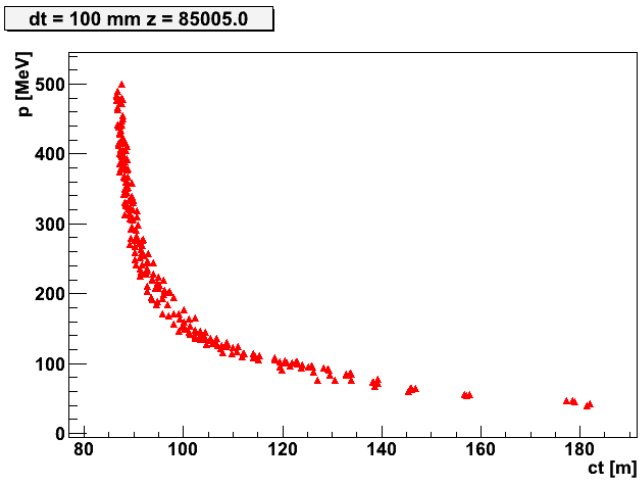


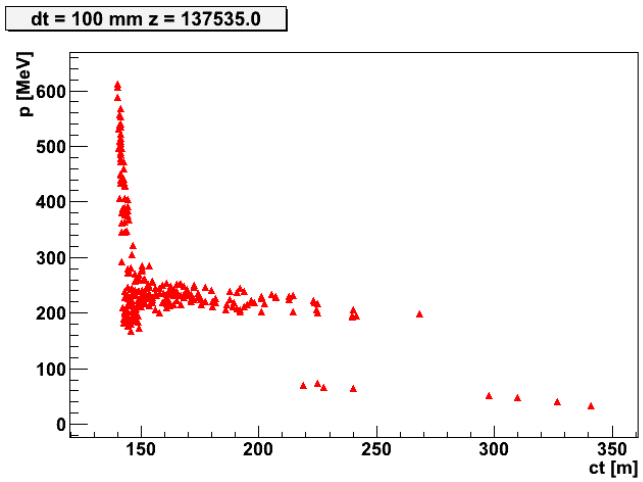
Toy beam – 100 mm Be



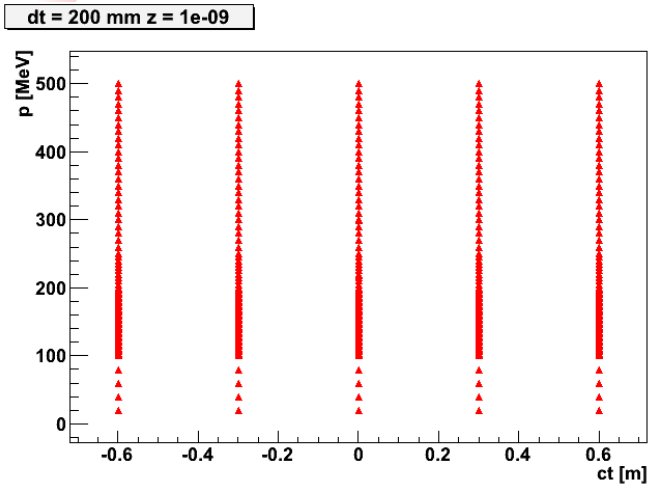


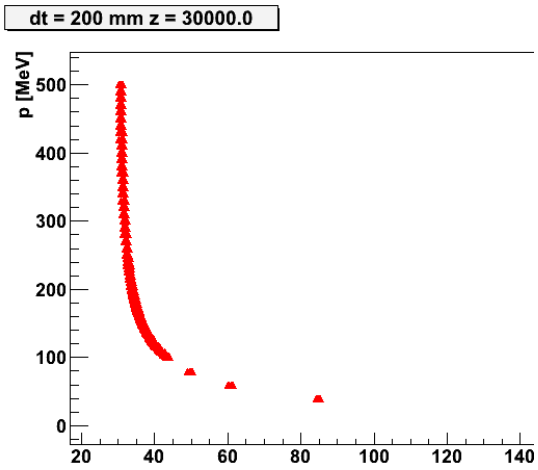


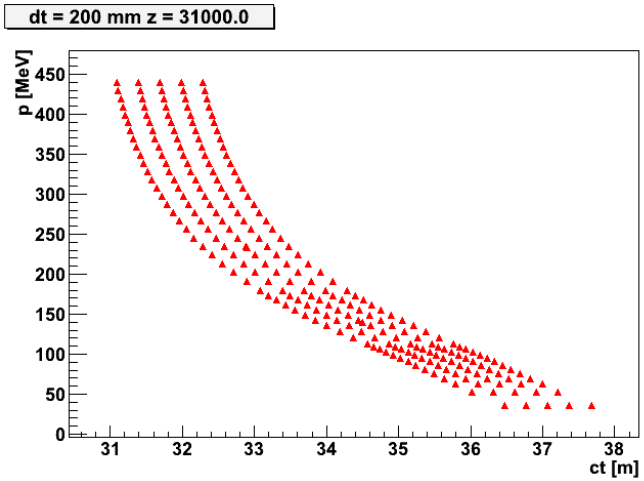


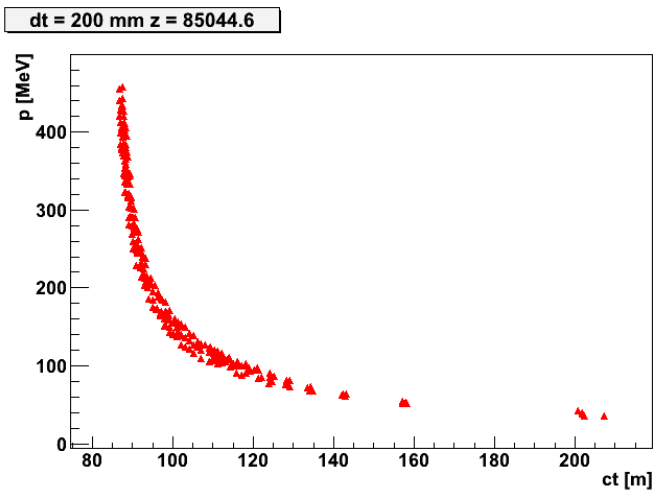


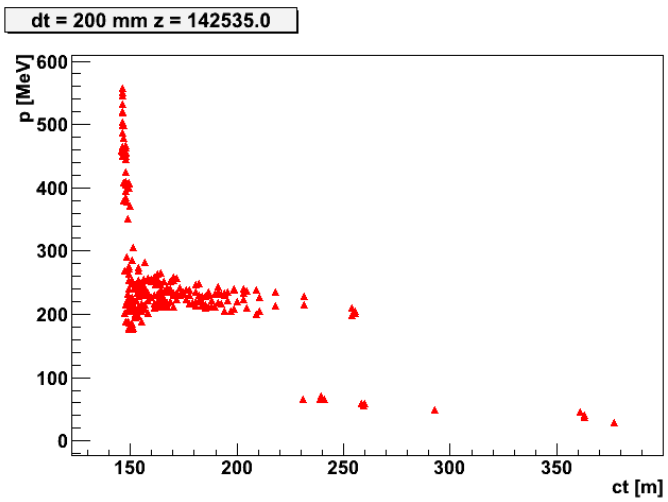
Toy beam – 200 mm Be



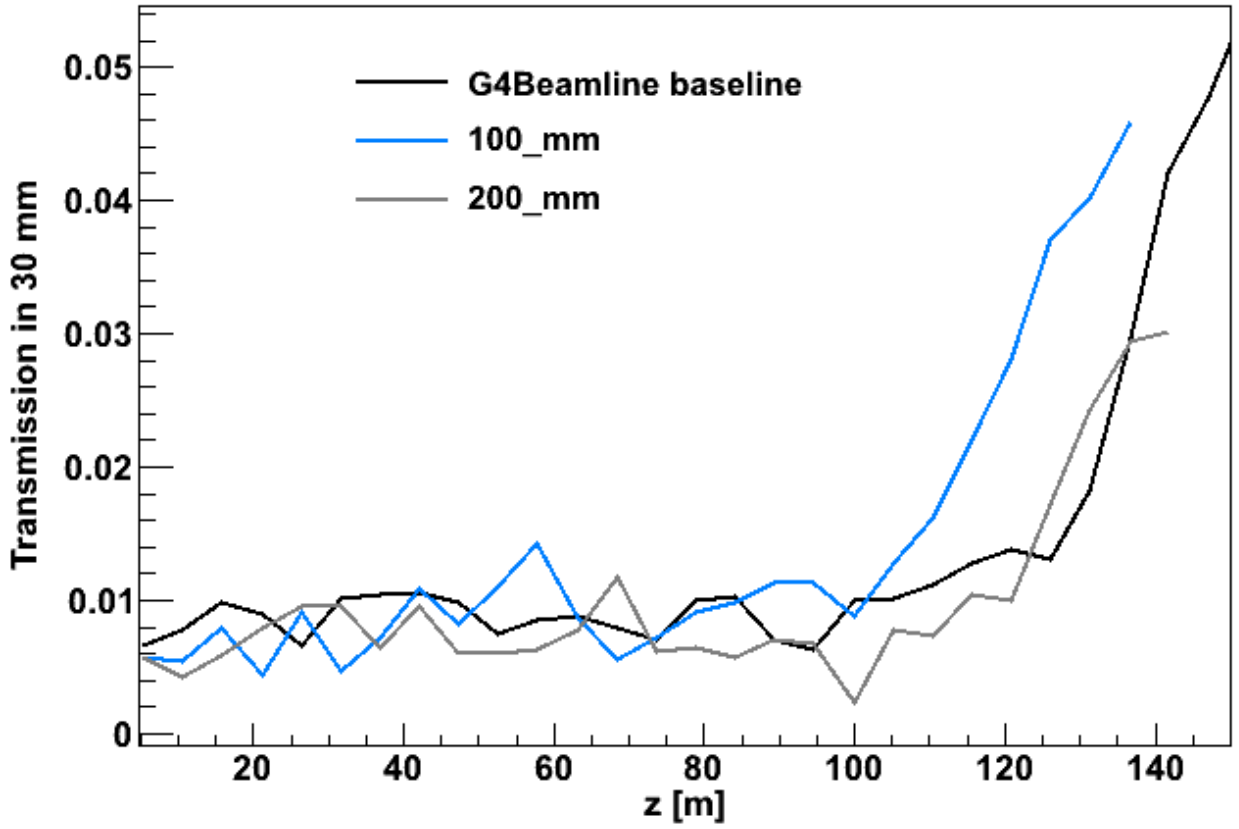








Good muon rate (to end of phase rot)



Conclusions

- New buncher/phase rotation algorithm for g4bl
- Captures the beam okay
- Produces very much shorter drift length (=> higher frequency RF)
  - From 60 m (baseline) to 27 m
- Can capture with proton absorber in... but it does make things worse
  - 100 mm proton absorber => ~10 % losses (acceptable?)
  - 200 mm proton absorber => ~ 50 % losses (not acceptable)