Preliminary FLUKA simulations for the Q6 quench test

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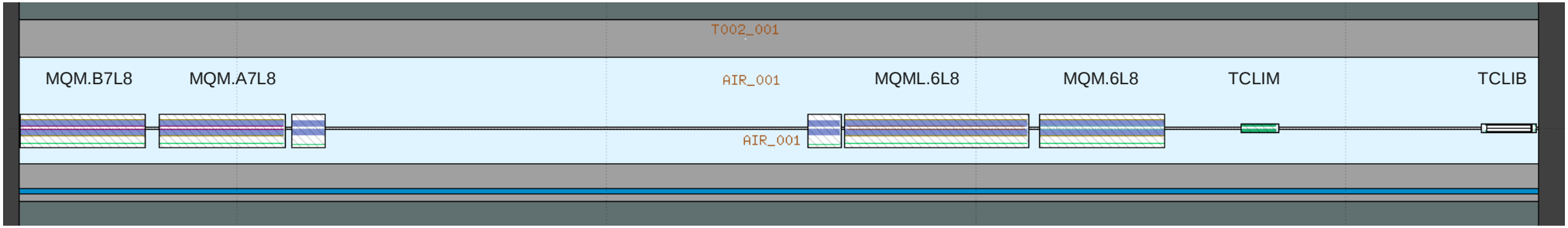
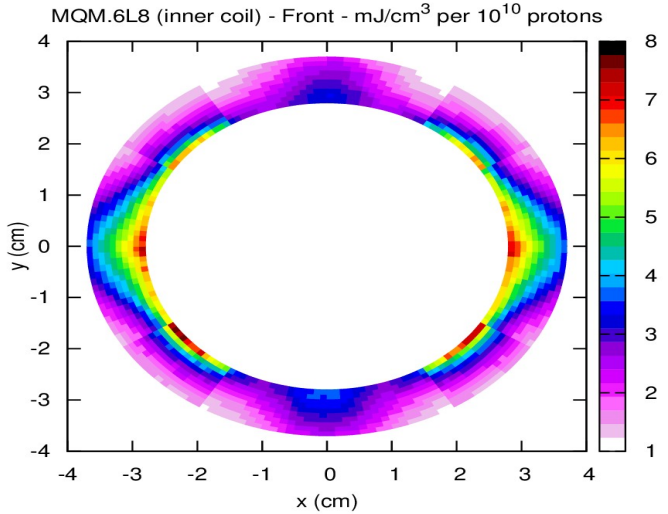
Introduction

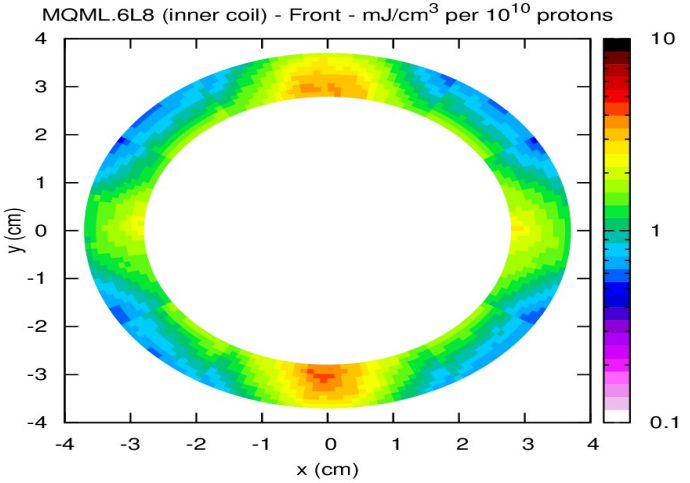
- Motive: To estimate energy density in Q6
- Beam 2: 450 GeV and σx = 976.97 μm, σy = 298.20 μm (at TCLIB)
- Impact parameter: 3σ on upper TCLIB jaw

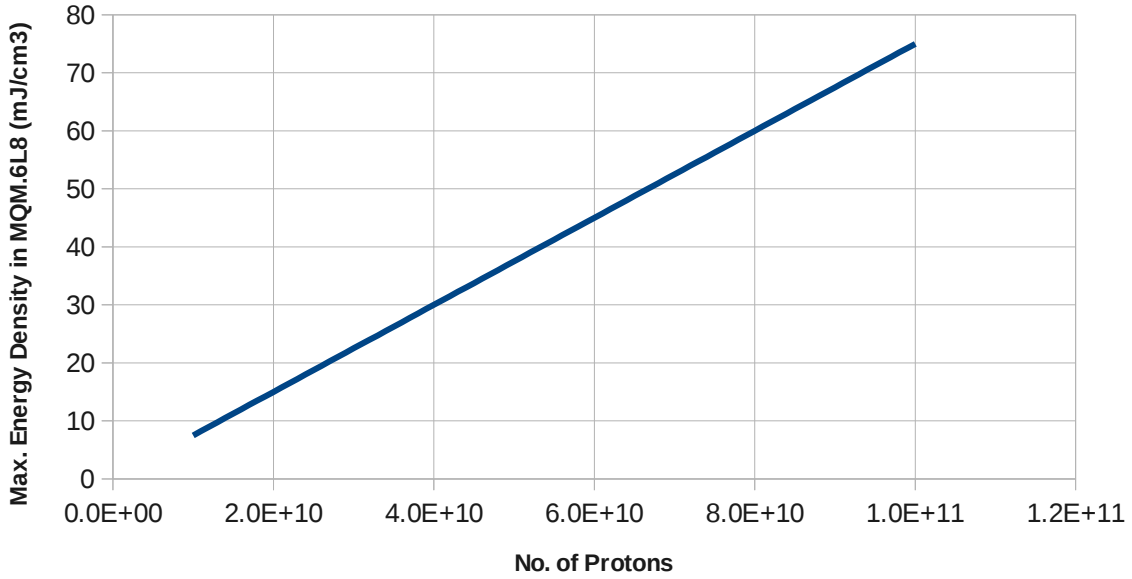


- Current in Q6 for 7 TeV
- Beam divergence neglected

Transverse Profiles & Quench Limit



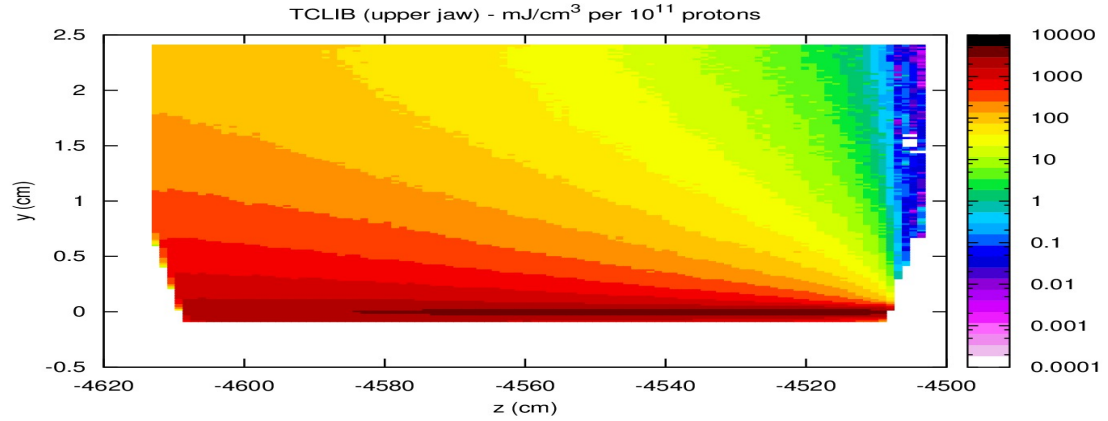


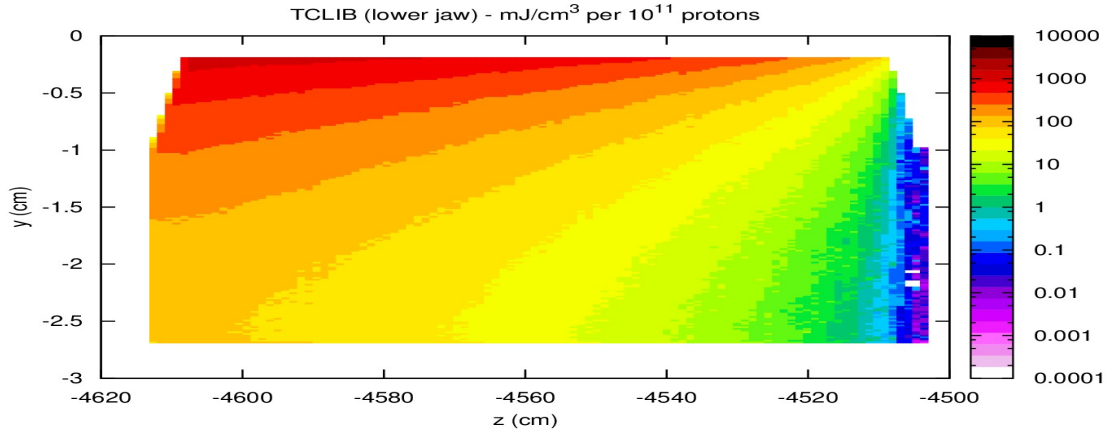


assuming 7.5 mJ/cm3 max energy density

(Large statistical error)

Energy Density in TCLIB





- Max energy density in upper jaw = 10 J
- Adiabatic temperature rise per bunch of 1e11 protons = 6.5 K

  (Assuming specific heat of graphite = 1.534 J/cm3.K)