Momentum reconstruction – systematics studies

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Momentum reconstruction systematics study

- Generation of electrons with SLIC (single particle gun) in the HPS acceptance
  - Fixed momentum: 1.056 GeV, σ 50 MeV (gaussian distribution)
  - Beam along z axis with 5 deg dispersion
  - Beamspot parameters: (0.,0.,0.), σ_r = 0.2 mm

- Test: how the reconstruction and GBL modify the momentum distribution of the tracks

- Tested geometry: v 4.4 fieldmap
- 50000 generated tracks $\rightarrow$ 17335 reconstructed tracks (consistent rec efficiency with 2015 real data)

- Preliminary results – some work still to be done
  - Need to align recon steering file
  - Need to extract generated spectra for reliable comparison
  - Increase statistics
  - Check different geometries (should not matter, but still…)
  - Check different input energies (energy dependence of reconstruction efficiency?)
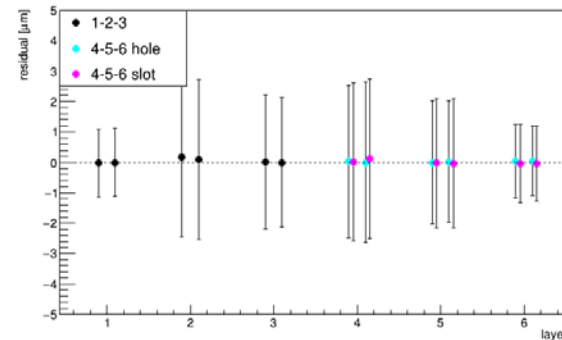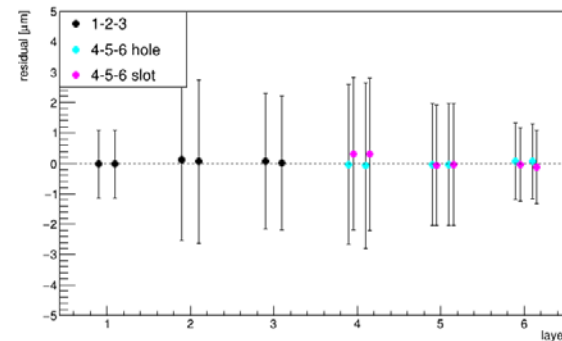 - Checks on physics: multiple scattering on/off, …

MC data geo 4.4 + fieldmap
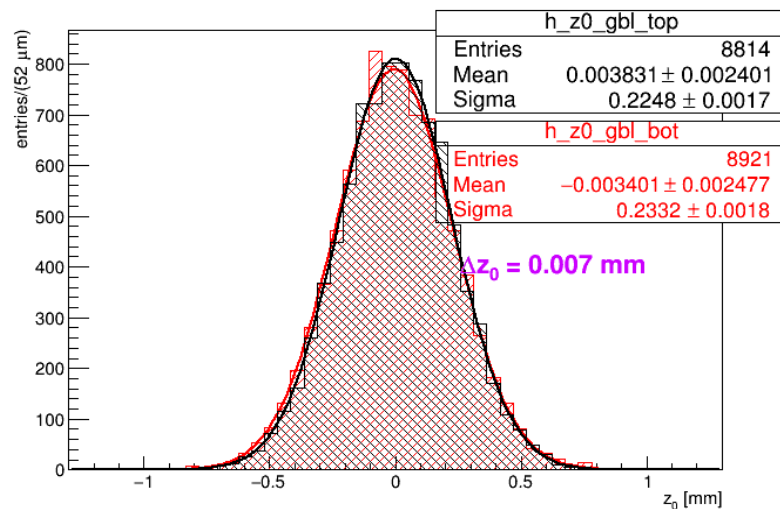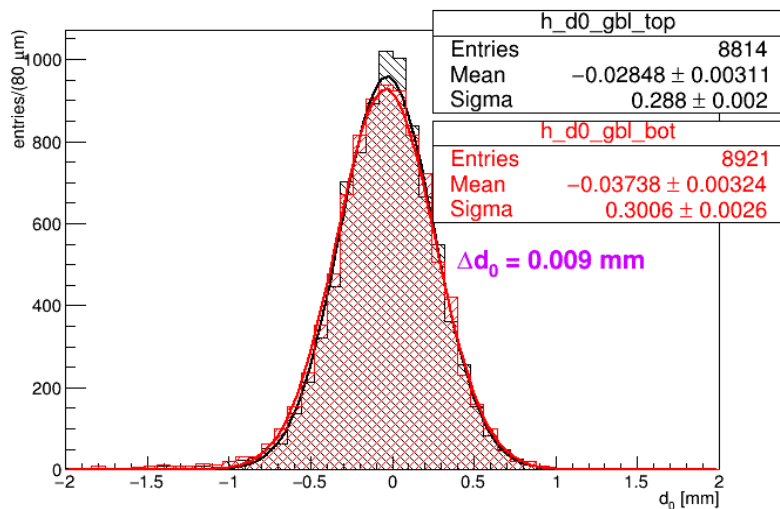
Momentum deviation t/b: 0 MeV/c

Reference: 1.056 MeV/c
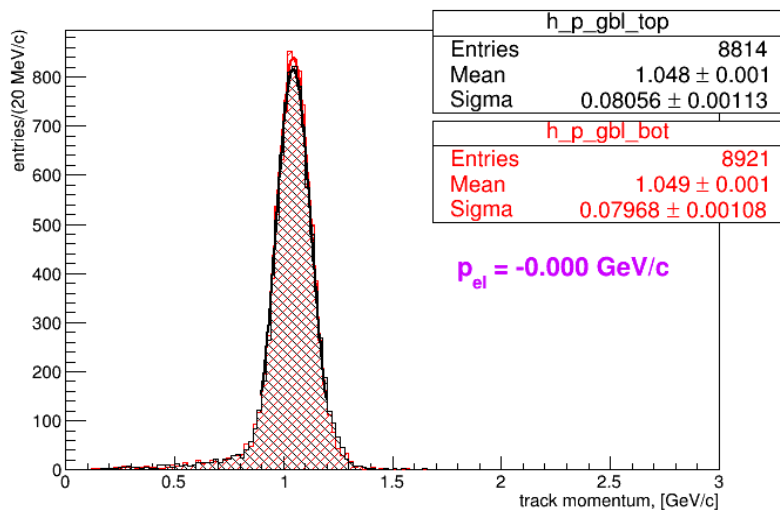
systematic offset: 8 MeV/c underestimation

Global translations along u+v – 2015 data