Chicane simulation update

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Front end phone meeting

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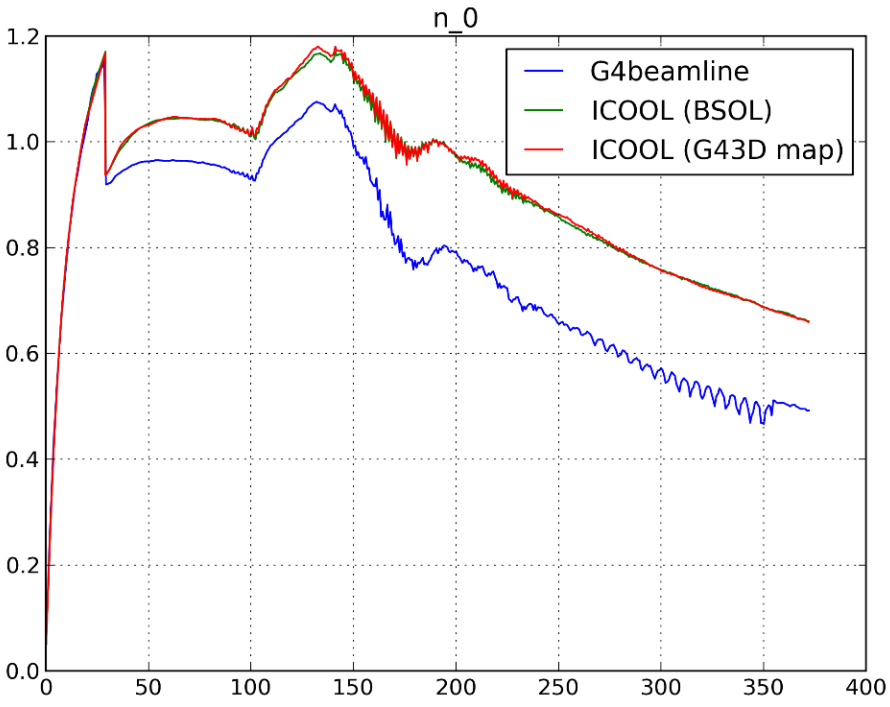
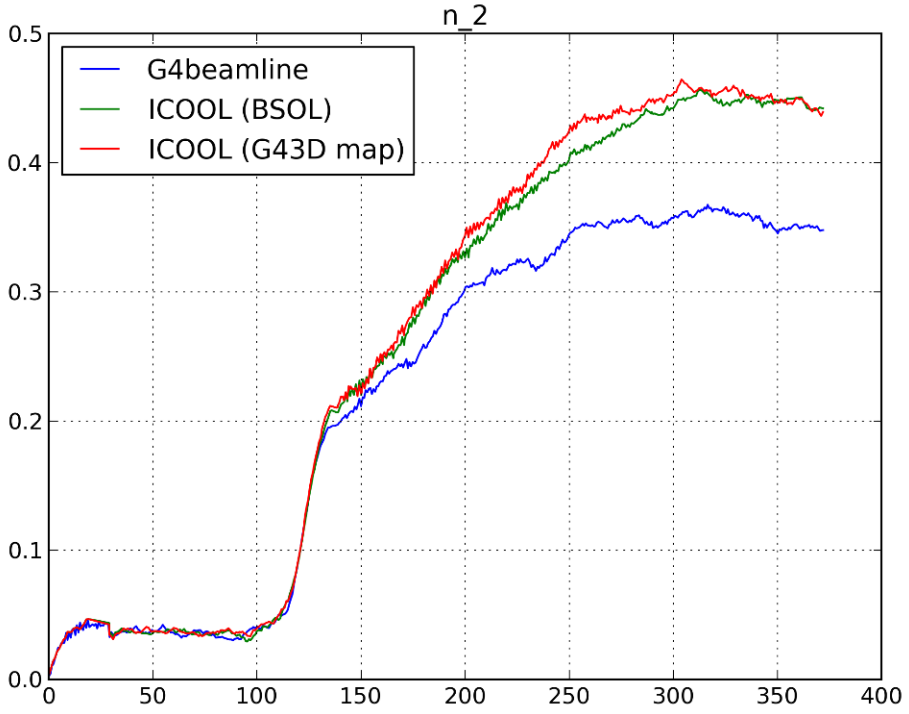
Last time: ICOOL vs G4beamline



Number of muons



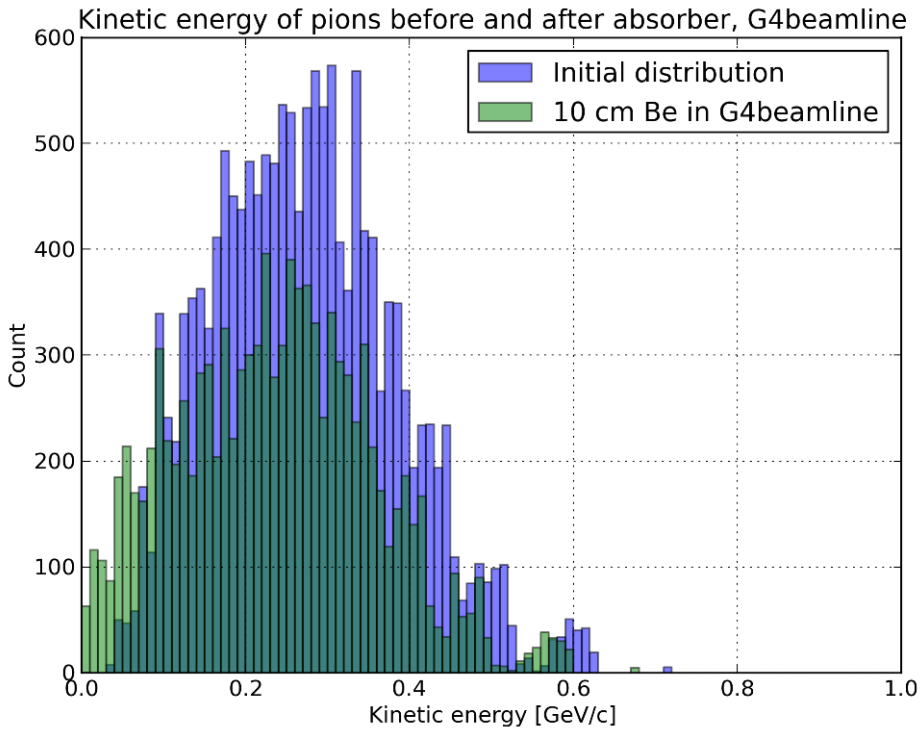
Number of useful muons within canonical cuts

Relatively large statistics: 300k incident particles, correct distribution (wrong distribution sent earlier by email, no 2 ns correction to time)

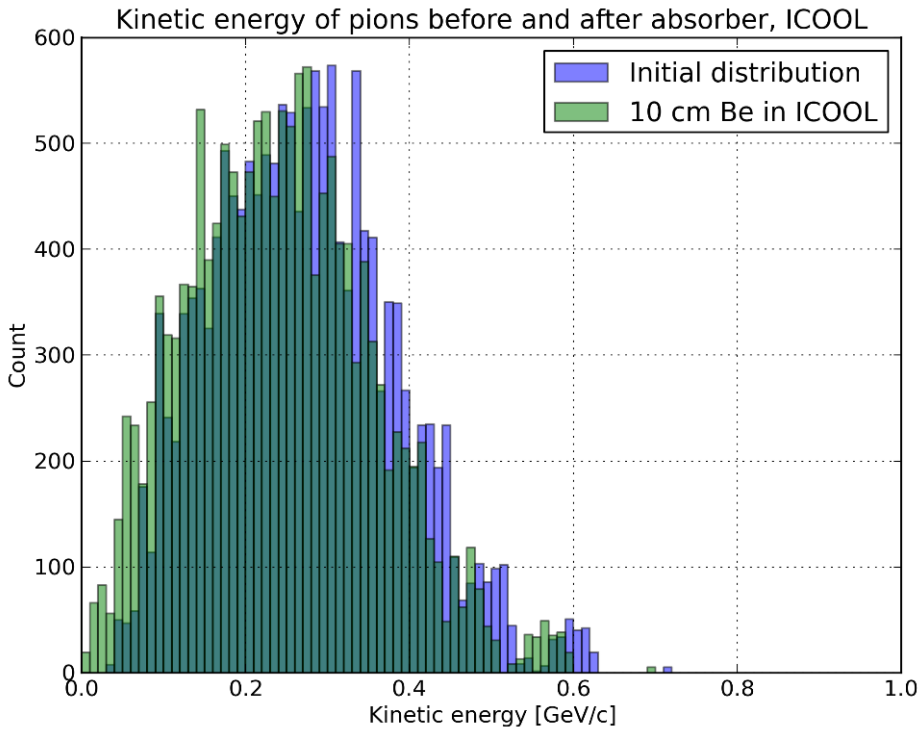
Source of discrepancy, mitigation

- Be proton absorber is causing a difference in transmission.
- ICOOL does not simulate pion propagation through material properly.
- Use G4beamline for the part of the channel where pions are of concern (capture + drift).
- Move the proton absorber downstream (following Dave's ICOOL decks).
- There is no G4beamline deck for the 325 MHz, 2 T frontend => working on it right now.

Pions through absorber: ICOOL vs G4beamline

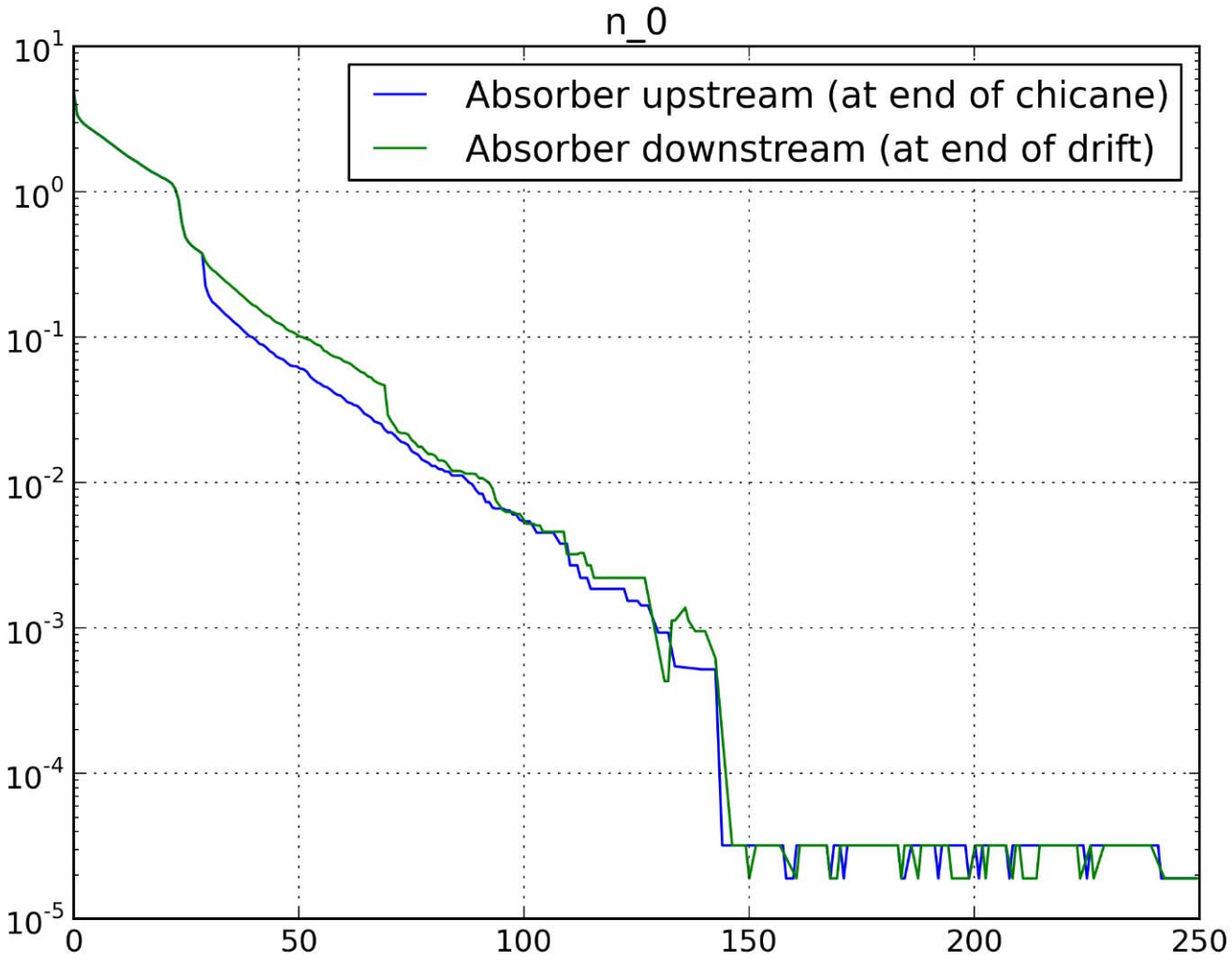


G4beamline

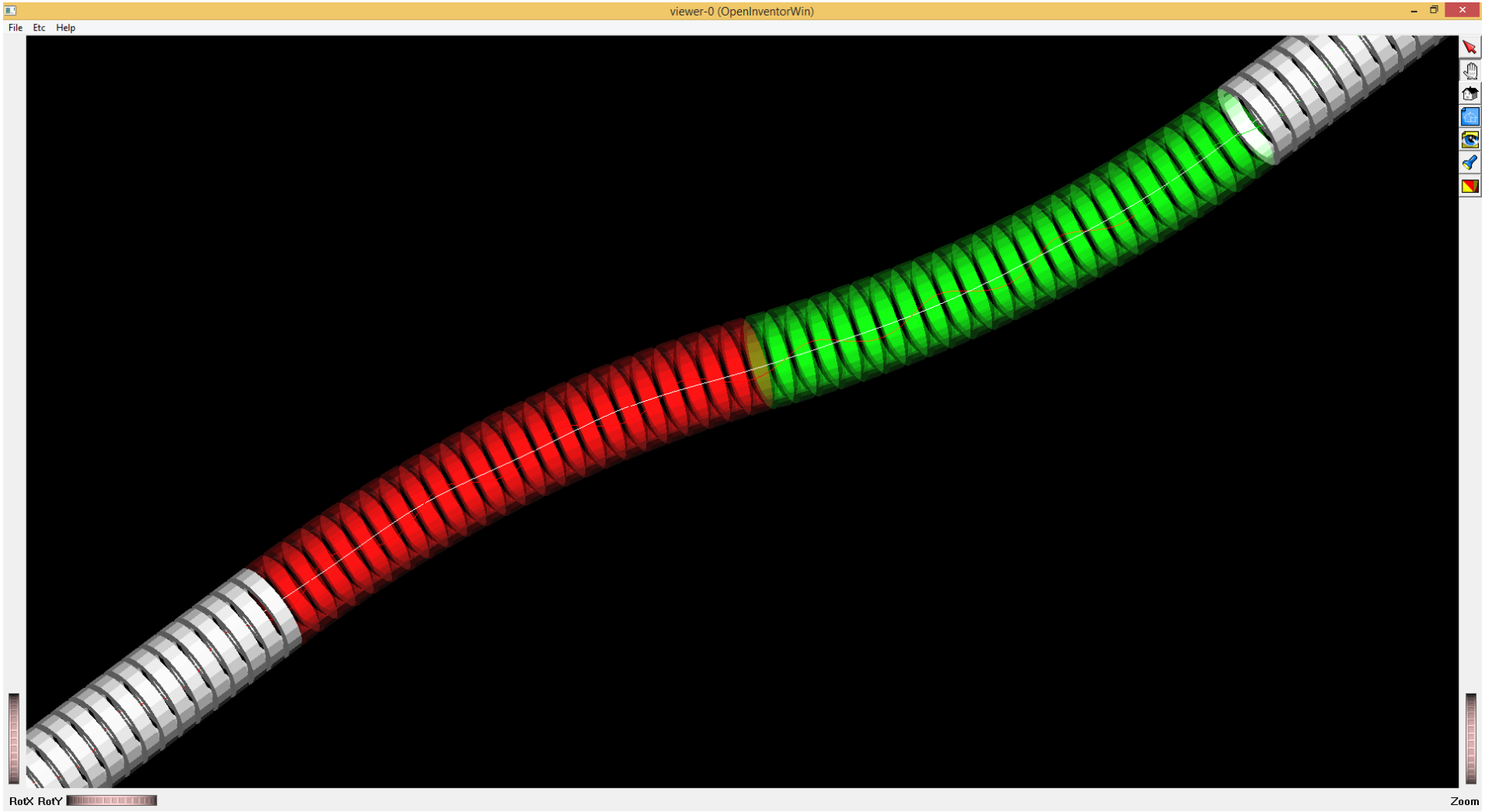


ICOOL

Pions: effect of moving the absorber



New chicane: 2 T



New Front End in G4beamline

- You won't see it in the picture, but the arc length of each cell in the chicane is slightly different from that in the drift part.
- The reason is the BSOL approach: I take the SREGION length + curvature to define the chicane angle => chicane arc length
- …while Chris was using a predefined number of cells of a certain arc length (250 mm) + angle per cell, and the Z length was derived from those.
- What I do is choose the cell length as close to 250 mm as possible based on the chicane arc length derived from BSOL parameters.
- This way the chicane length is the same in ICOOL and G4bl.

Current status

I have:

- the short taper (14.75 m),
- some initial drift (6 m),
- chicane at 2 T (12 m),
- second part of the drift (43 m).

I don’t have:

- Buncher/phase rotator/matcher/cooler, but presumably those could be simulated in ICOOL, since pions are not an issue anymore.