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Tracking performance with the tagged Brycecanyon geometry

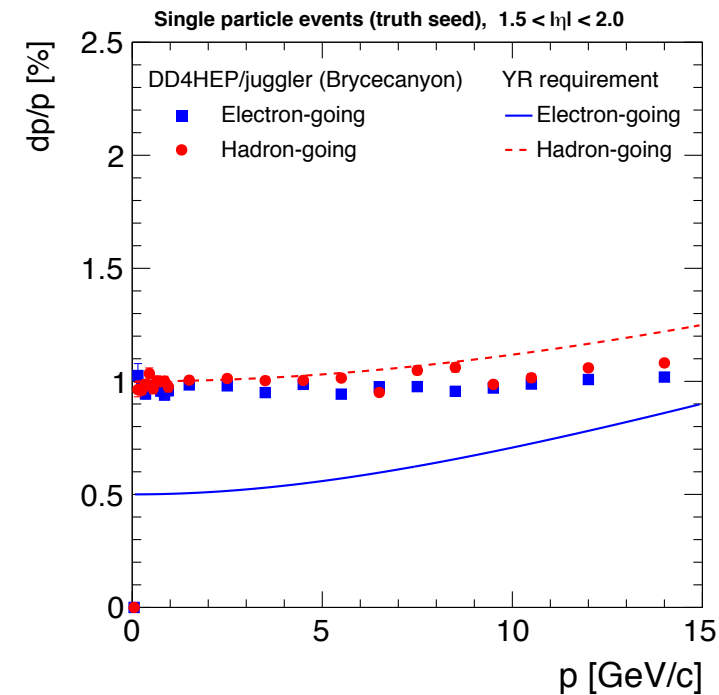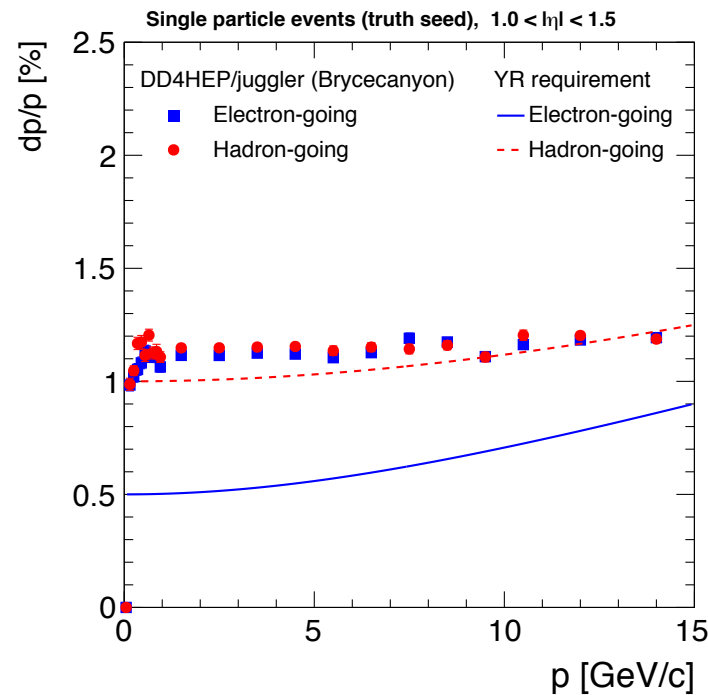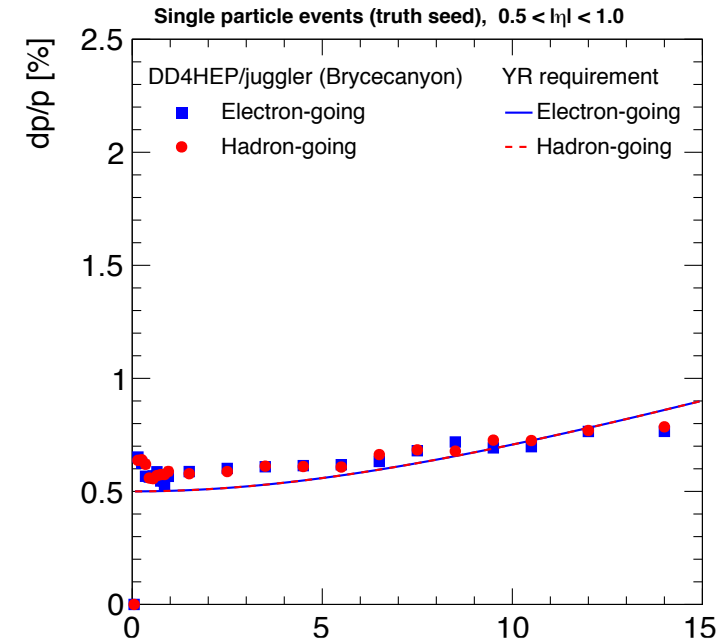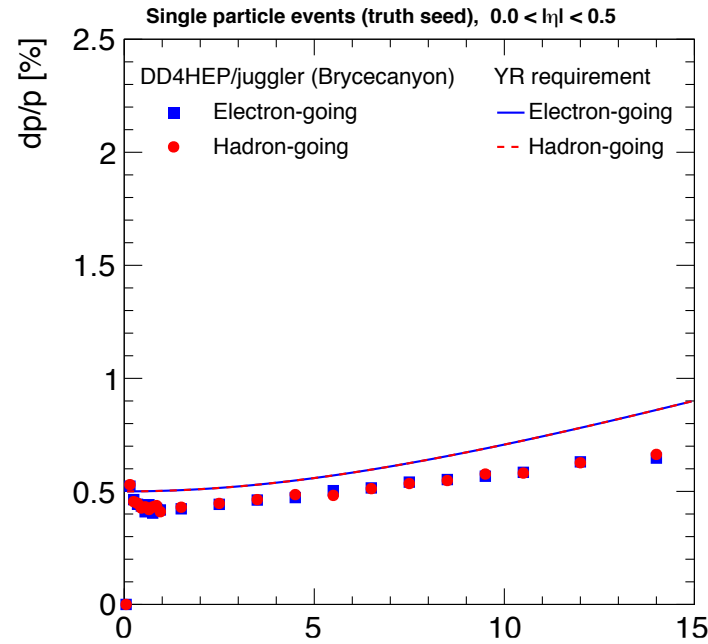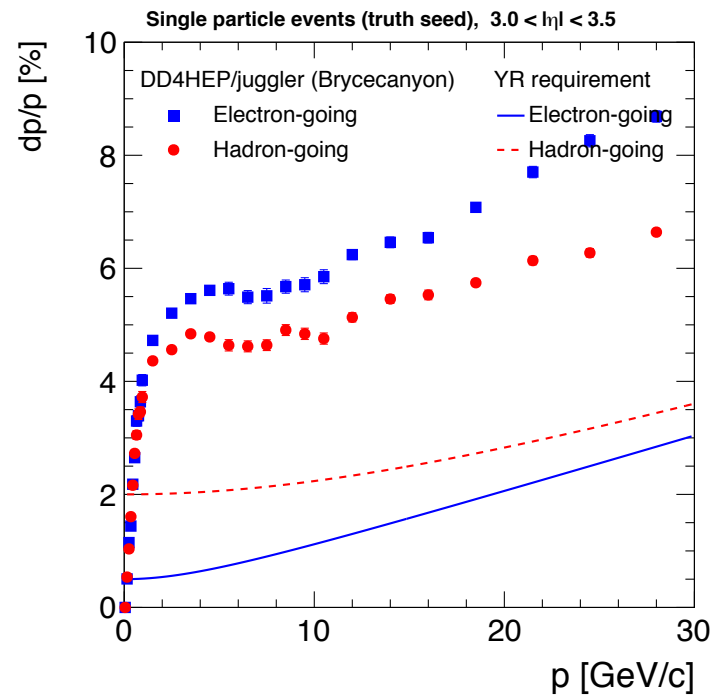Wenqing Fan

EIC RNC meeting, 11/29/2022

▸ **Geometry tag: Brycecanyon**

- ◈ 5 Barrel silicon: spatial resolution 10µm/sqrt(12), r = 3.6, 4.8, 12, 27, 42cm
- ◈ 1 Barrel MPGD: spatial resolution 150µm, r = 55cm
- ◈ 1 Barrel TOF: spatial resolution 30x3000µm, r = 64.6cm
- ◈ 10 Endcap silicon: spatial resolution 10µm/sqrt(12), z = -115, -90, -65, -45, 25, 25, 45, 70, 100, 135cm
- ◈ 1 Endcap TOF: spatial resolution 30µm, z = 192cm
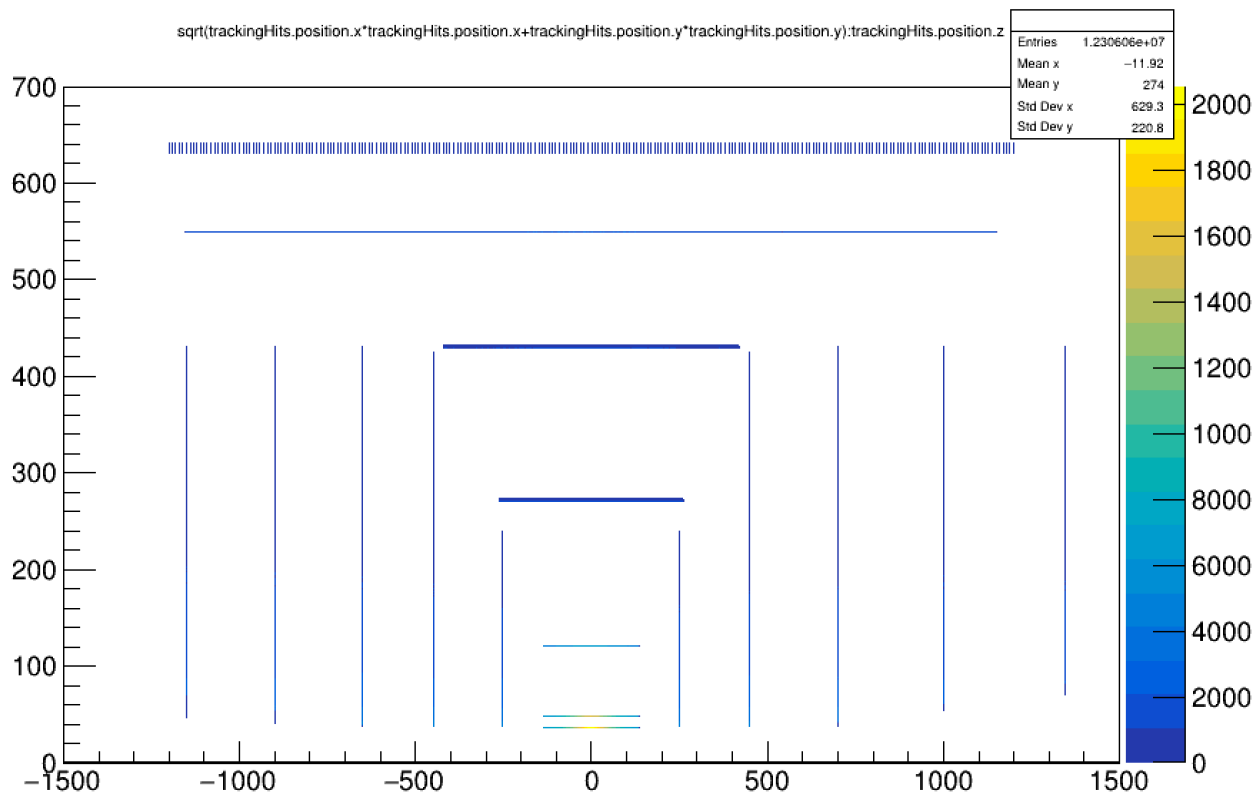
<u>NOT</u> in track reconstruction (juggler crushes at random event)

Same/similar performance in the electron and hadron going direction

Single particle events (truth seed), 0.0 < |η| < 0.5

Single particle events (truth seed), 0.5 < |η| < 1.0

Single particle events (truth seed), 1.0 < |η| < 1.5

Single particle events (truth seed), 1.5 < |η| < 2.0
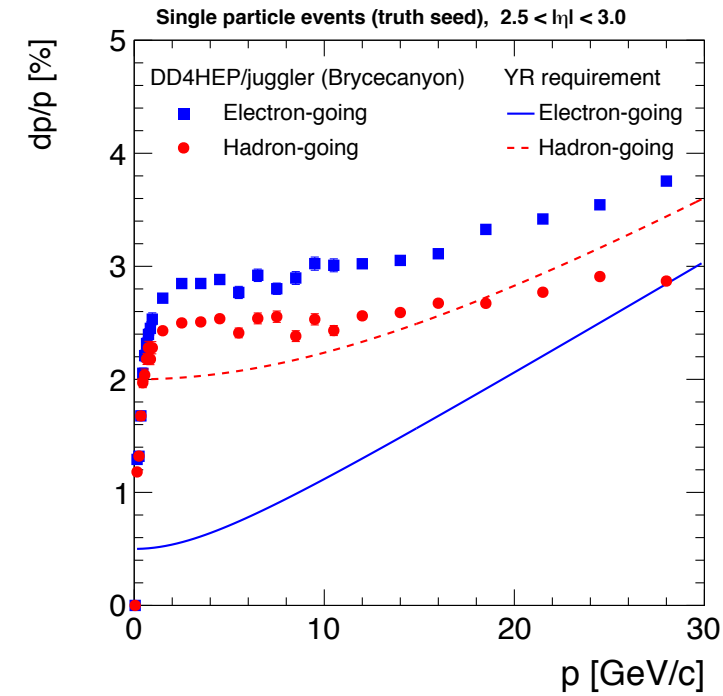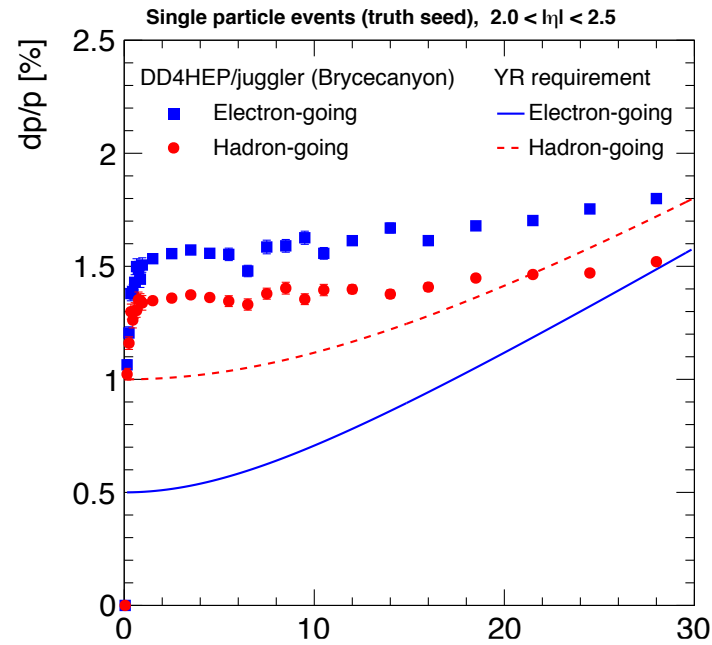
10-20% better performance at hadron-going direction

Single particle events (truth seed), 2.0 < |η| < 2.5

Single particle events (truth seed), 2.5 < |η| < 3.0

Single particle events (truth seed), 3.0 < |η| < 3.5

Summary

▸ Looked at the momrentum resolution with the Brycecanyon geometry + new MARCO field map

- Results look reasonable
- 10-20% worse performance at very backward rapidity comparing to very forward rapidity

▸ Currently the endcap TOF hits are not included in the track reconstruction chain

- Check with software/simulation group
- Can still compare the juggler and eic-recon results for backward and mid rapidity range