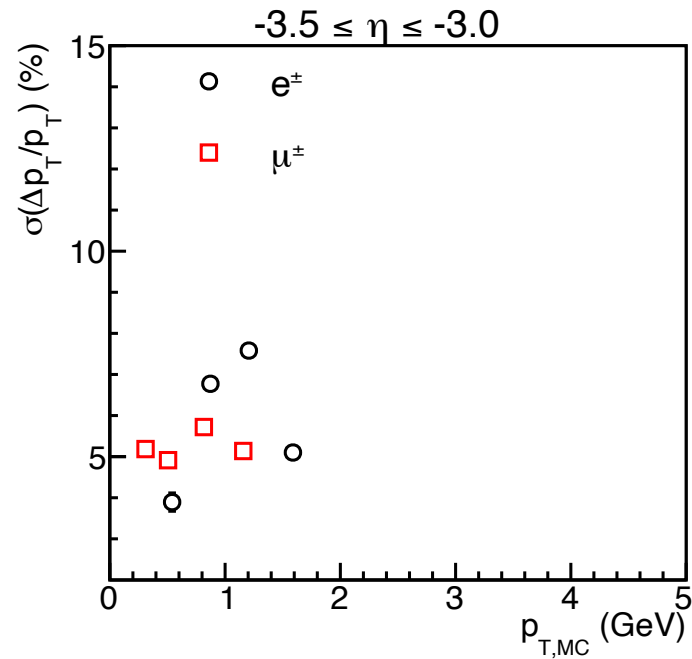# Tracking Simulations with DD4hep

Presenter(s)
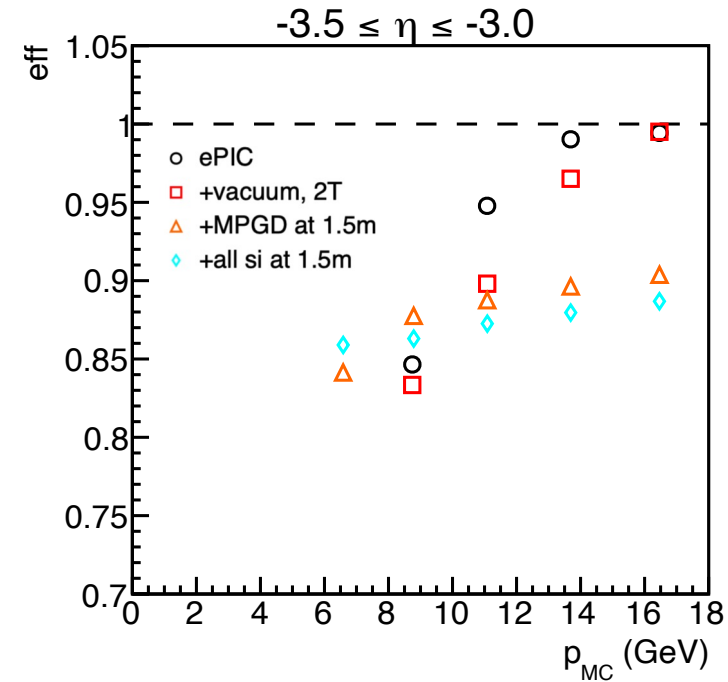
Date

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Recap – the Issues with DD4hep/ACTS

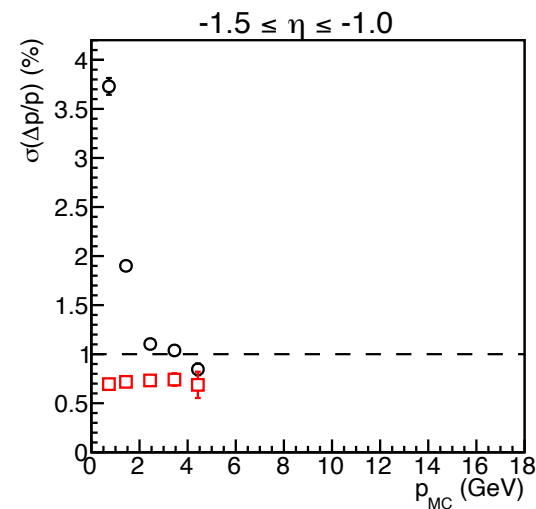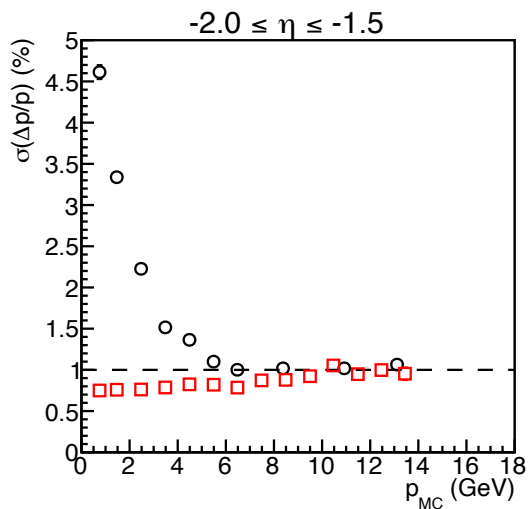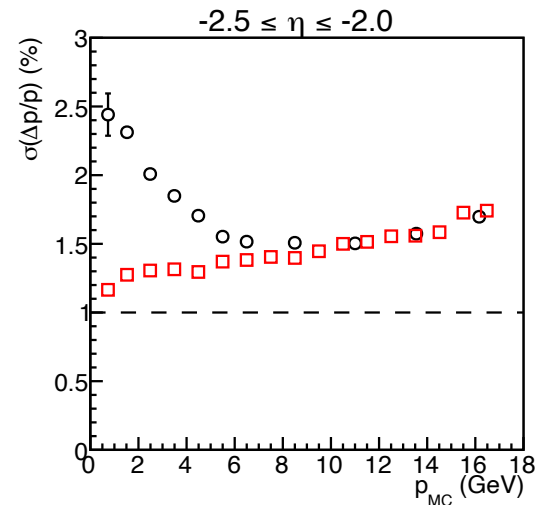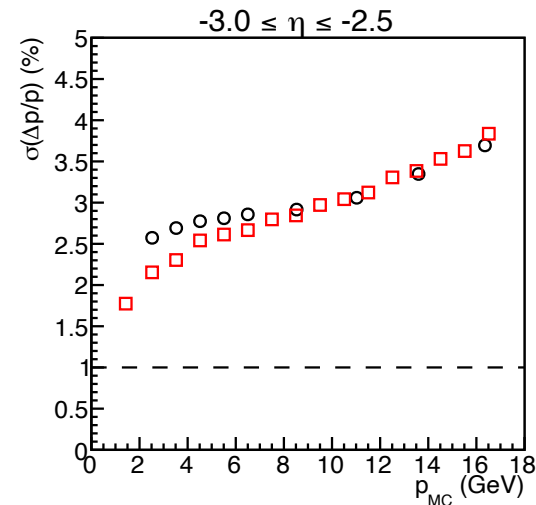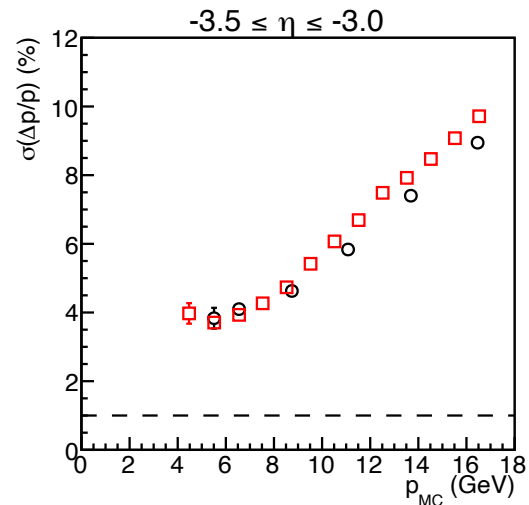Wiggles in p_T resolutions

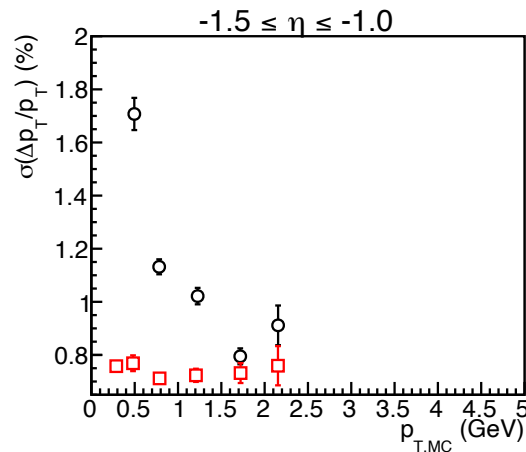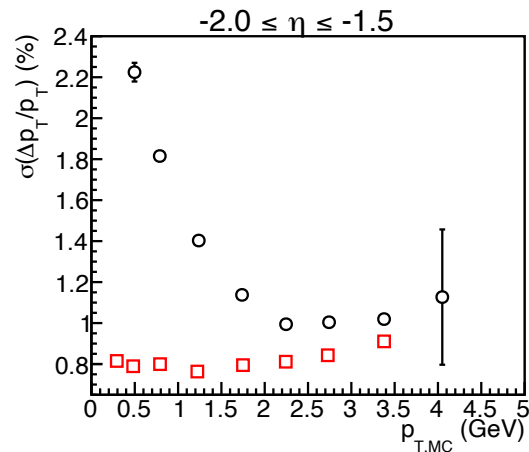Efficiency didn't make sense

w/ and w/o
Correct Material Map

Backward Momentum Resolutions

- ○ Wrong mat map
- □ Correct mat map

- Sartre events, electron tracks
- "Realistic seed" ReconstructedChargedParticles branch
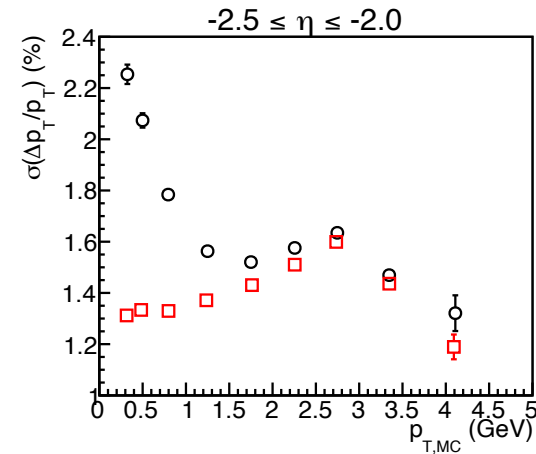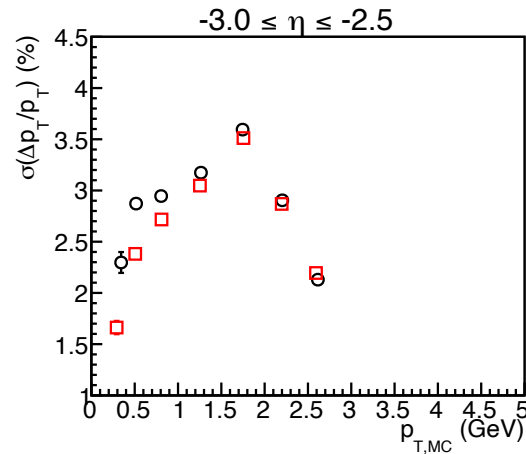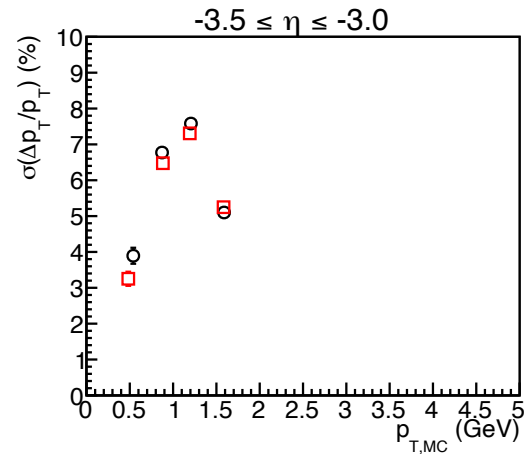- Resolutions at low momentum are improved with the corrected map

# Backward p_T Resolutions

- Wrong mat map
- Correct mat map

- Sartre events, electron tracks
- "Realistic seed" ReconstructedChargedParticles branch
- Resolutions at low p_T are improved with the corrected map
- At high p_T, the resolutions w/ and w/o the corrected map converge

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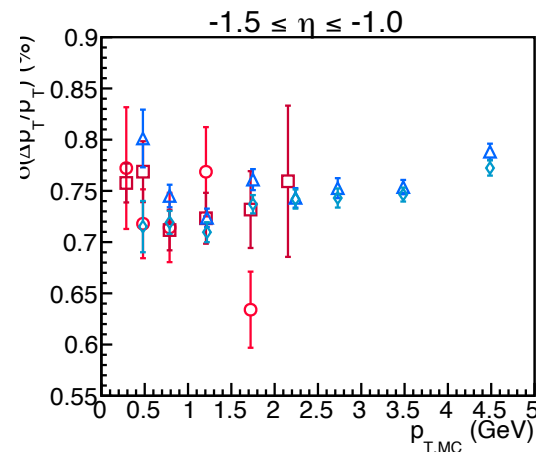Cheuk-Ping Wong
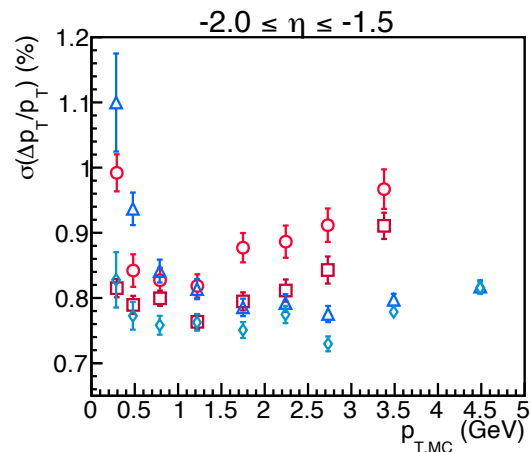
5

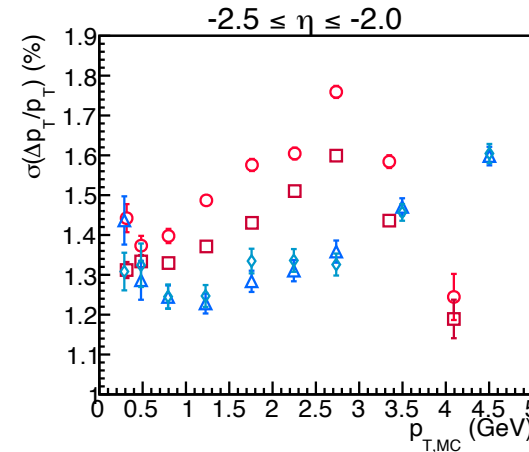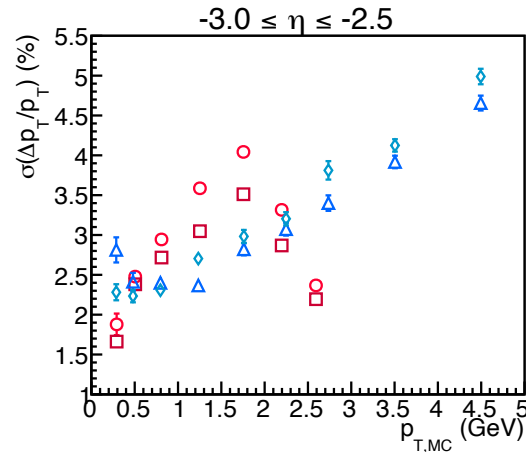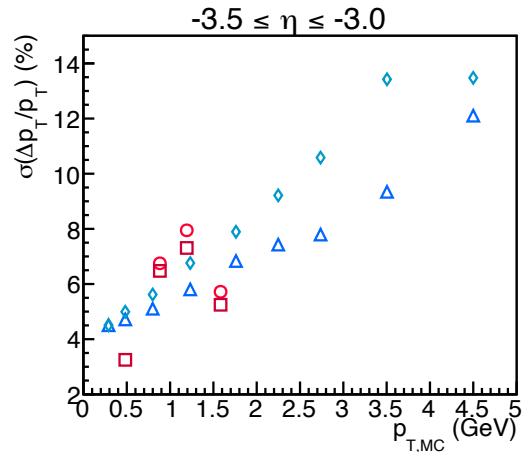# Sartre Events vs Single Track Events

Cheuk Ping Wong

Momentum Resolutions
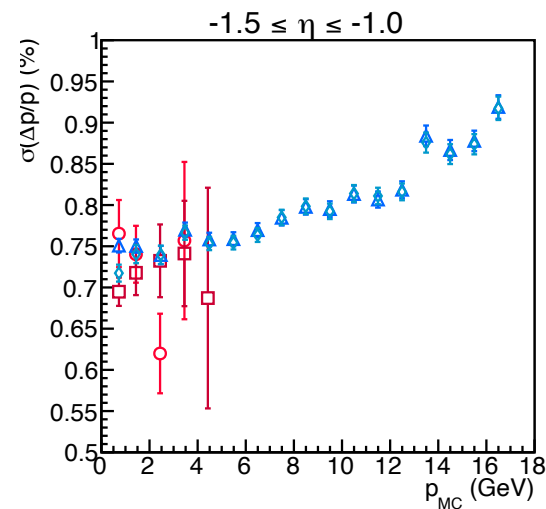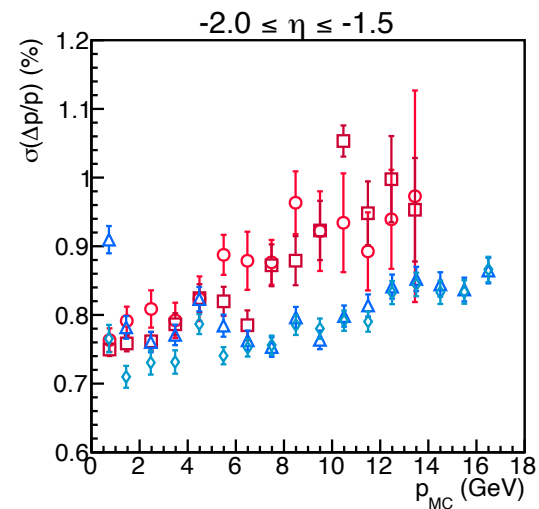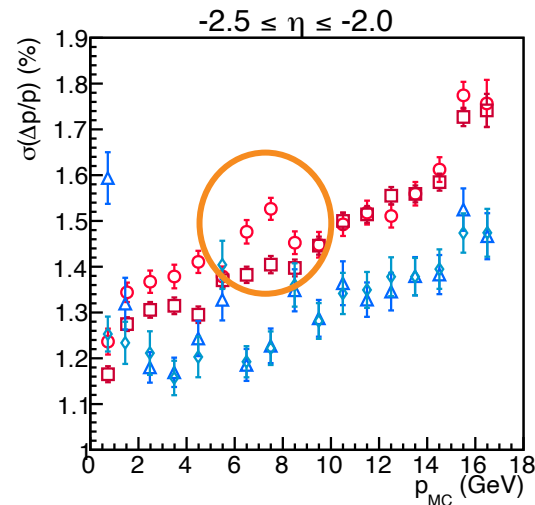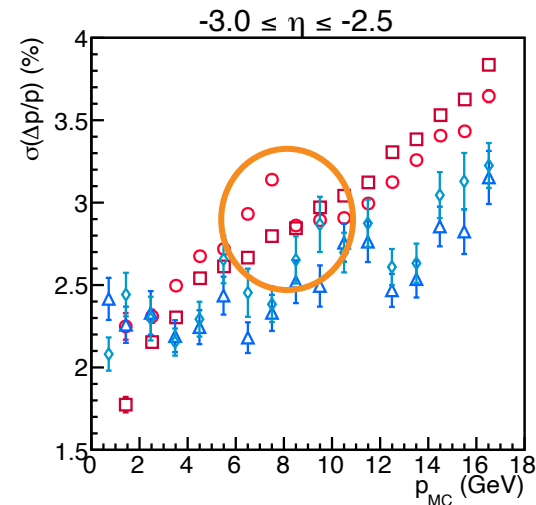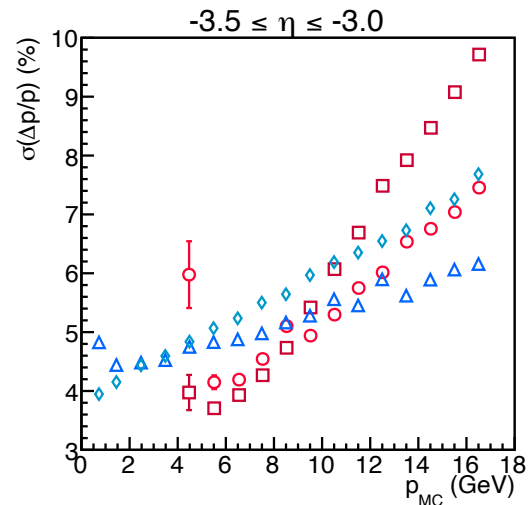
- Electron tracks
- Correct material map
- A step at p=8GeV ?

Legend:
- ○ Sartre, true seeding
- □ Sartre, realistic seeding
- △ Single trk, true seeding
- ◇ Single trk, realistic seeding

Cheuk-Ping Wong
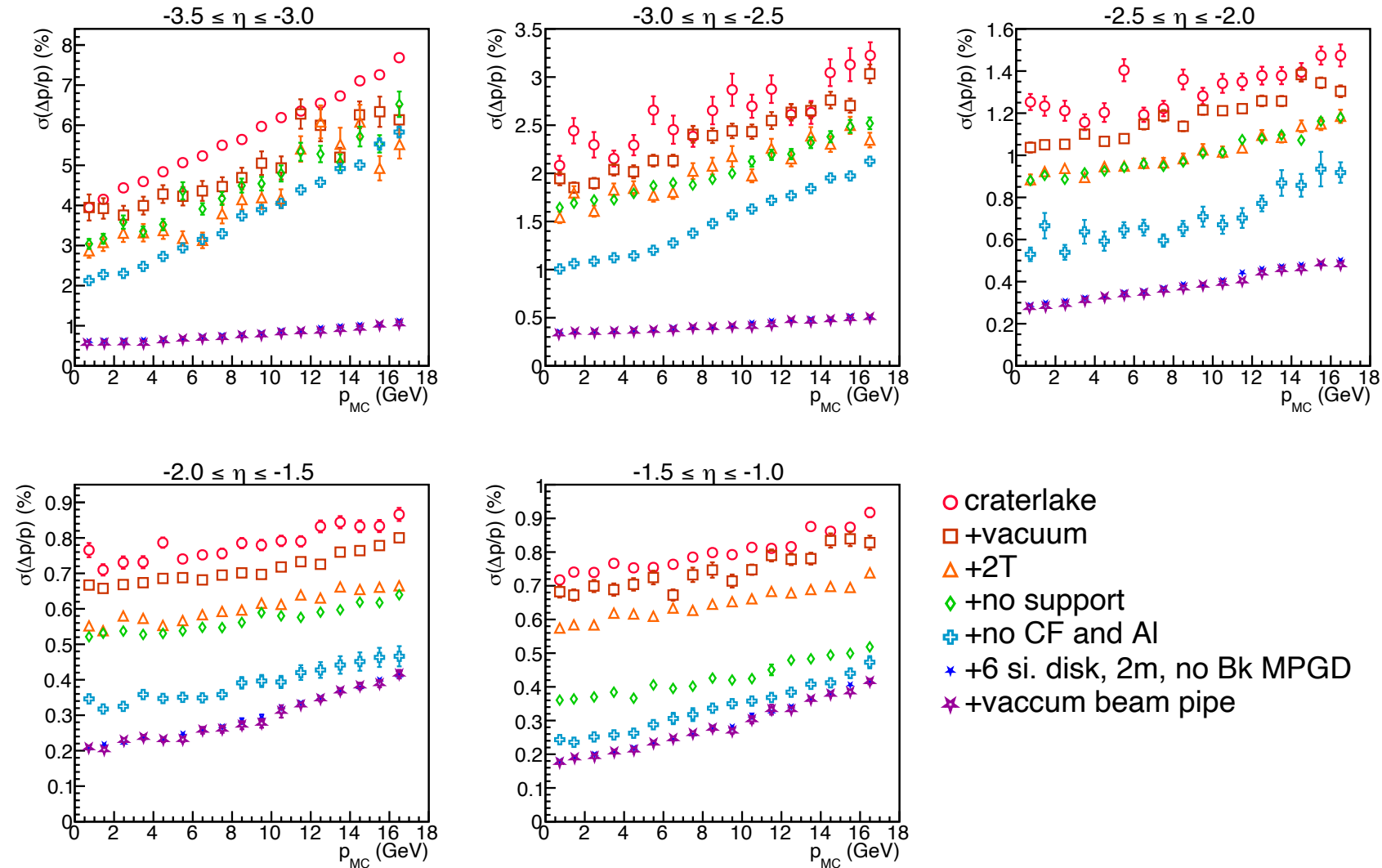
7

The Wiggle in p_T Resolutions

- Electron tracks
- Correct material map
- Wiggles only appear in Sartre events
- There is differences (10-30%) between true and realistic seedings

Legend:
- ○ Sartre, true seeding
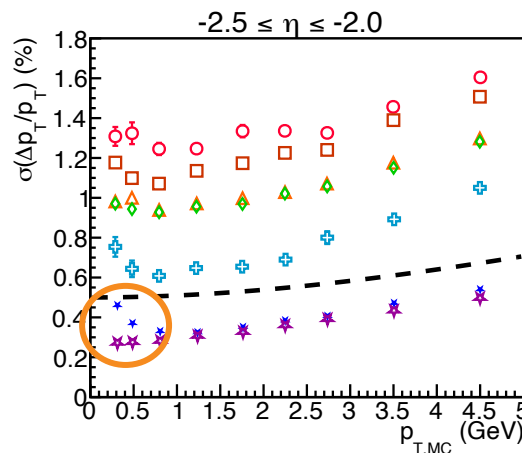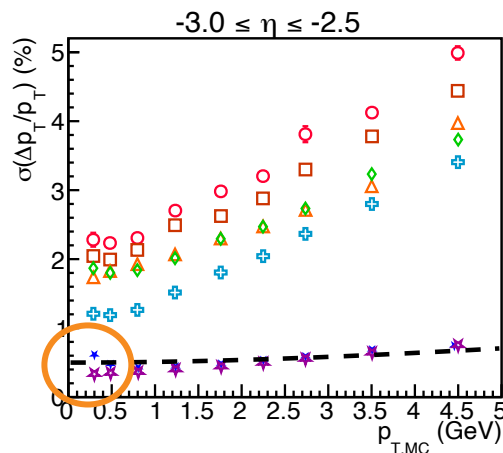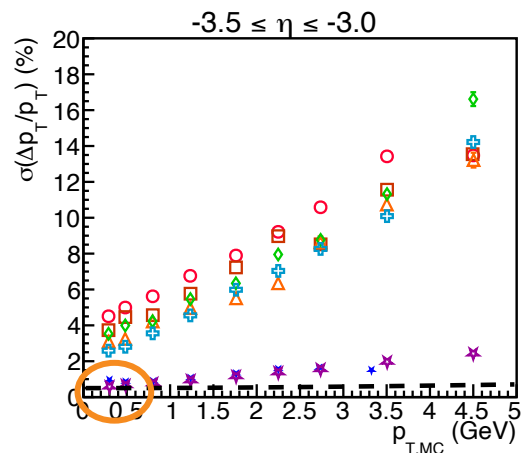- □ Sartre, realistic seeding
- △ Single trk, true seeding
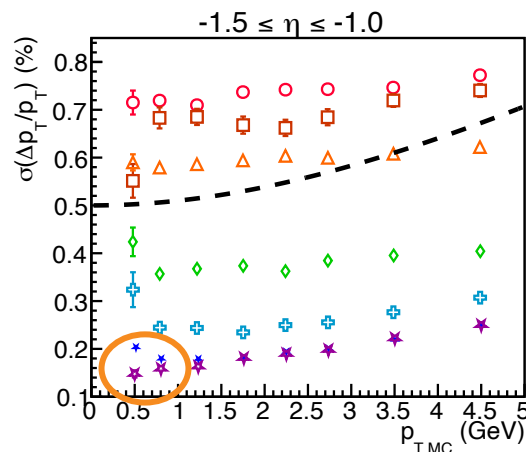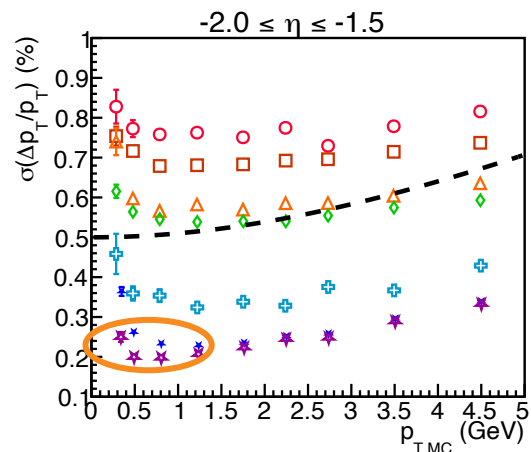- ◇ Single trk, realistic seeding

Various Detector Setup

Subtitle

Momentum Resolutions

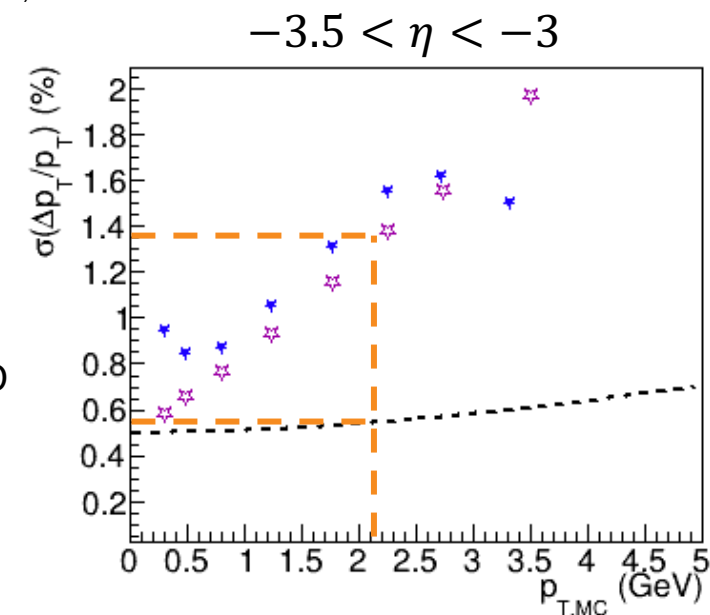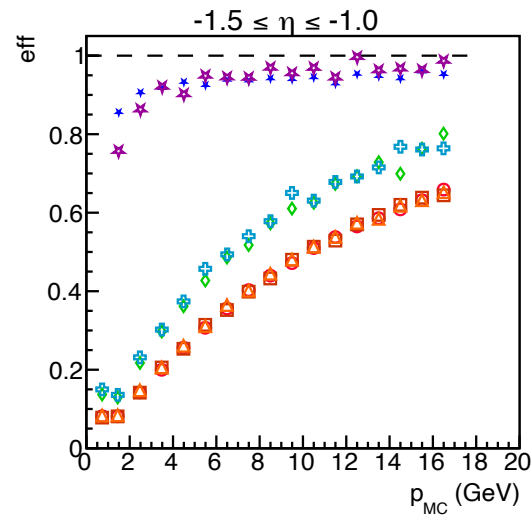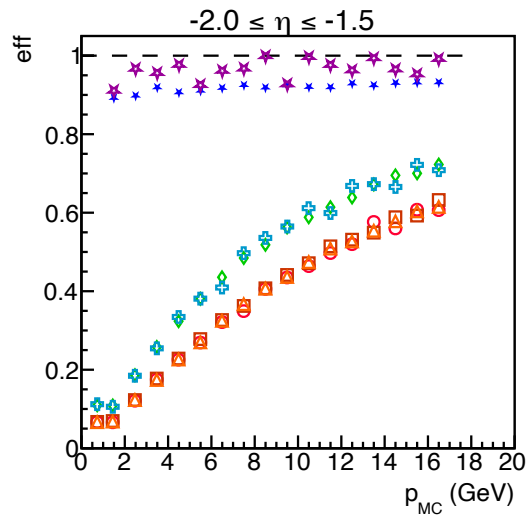# p$_T$ Resolutions

Finally see the improvement in p$_T$ resolution at low p$_T$ without the beam pipe

$-3.5 < \eta < -3$

Legend:
- ○ craterlake
- □ +vacuum
- △ +2T
- ◇ +no support
- ⊕ +no CF and Al
- ✳ +6 si. disk, 2m, no Bk MPGD
- ✶ +vaccum beam pipe

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Efficiency

Tracking efficiency looks normal now!

Summary

- Better resolutions with correct ACTS material map
- The wiggles in p_T resolutions occur only in Sartre events regardless of seedings
- Efficiency looks reasonable in single track events

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