

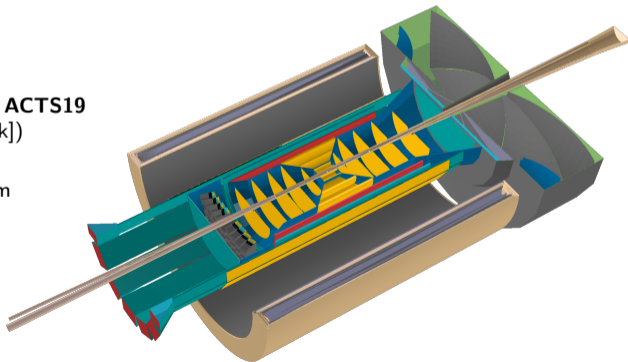
EPIC detector performance studies - DD4hep and eicrecon -

**EPIC TOF Meeting
January 30, 2023**

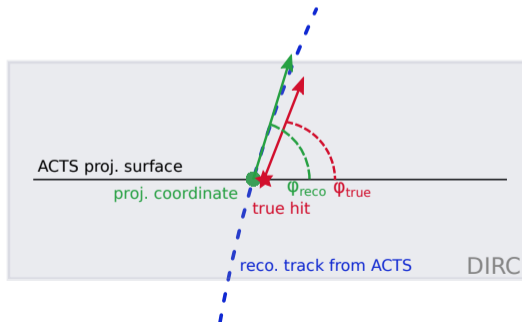
Nicolas Schmidt



- Arches with only tracking systems
→ also backwards TTL layer included for these studies
- Single particle simulations:
→ flat in $0.1 < p < 10$ GeV, $0 < \varphi < 2\pi$ and $-4 < \eta < 4$
→ 4M events per detector setup generated on ORNL Cades
- Reconstruction with latest eicrecon software
→ truth seeded ACTS tracking
- **Detailed forward TOF geometry not working in ACTS19**
→ basic TrapEndcapTracker was alternative ([link])
- **Detailed geom. fully working in ACTS20!!**
→ following studies performed with detailed geom



- Reconstructed angle:
 - create ACTS projection surface at center (and/or entrance) of Cherenkov detectors (to be confirmed with cherenkov group)
 - momentum vector of track at projection surface provides position and angles
- True angle:
 - deactivate cherenkov light propagation in npsim
 - use hit closest to projection surface as reference for angle and position (angle obtained from hit momentum vector)
- Status:
 - Simulations (10M events) produced on cades with special configuration
 - Tracking studies processor finished ([link])



Angular resolutions

- Angular resolutions (θ and φ) determined
 - currently only with TOF
 - effect of excluding TOF in reco. to be determined
- distinct differences between barrel and forward for φ
- η resolution approximately the same in barrel and fwd
- Does this resolution meet Cherenkov requirements?

