

CyMBaL/MPGD hits

MPGD Meeting 17/06/2024

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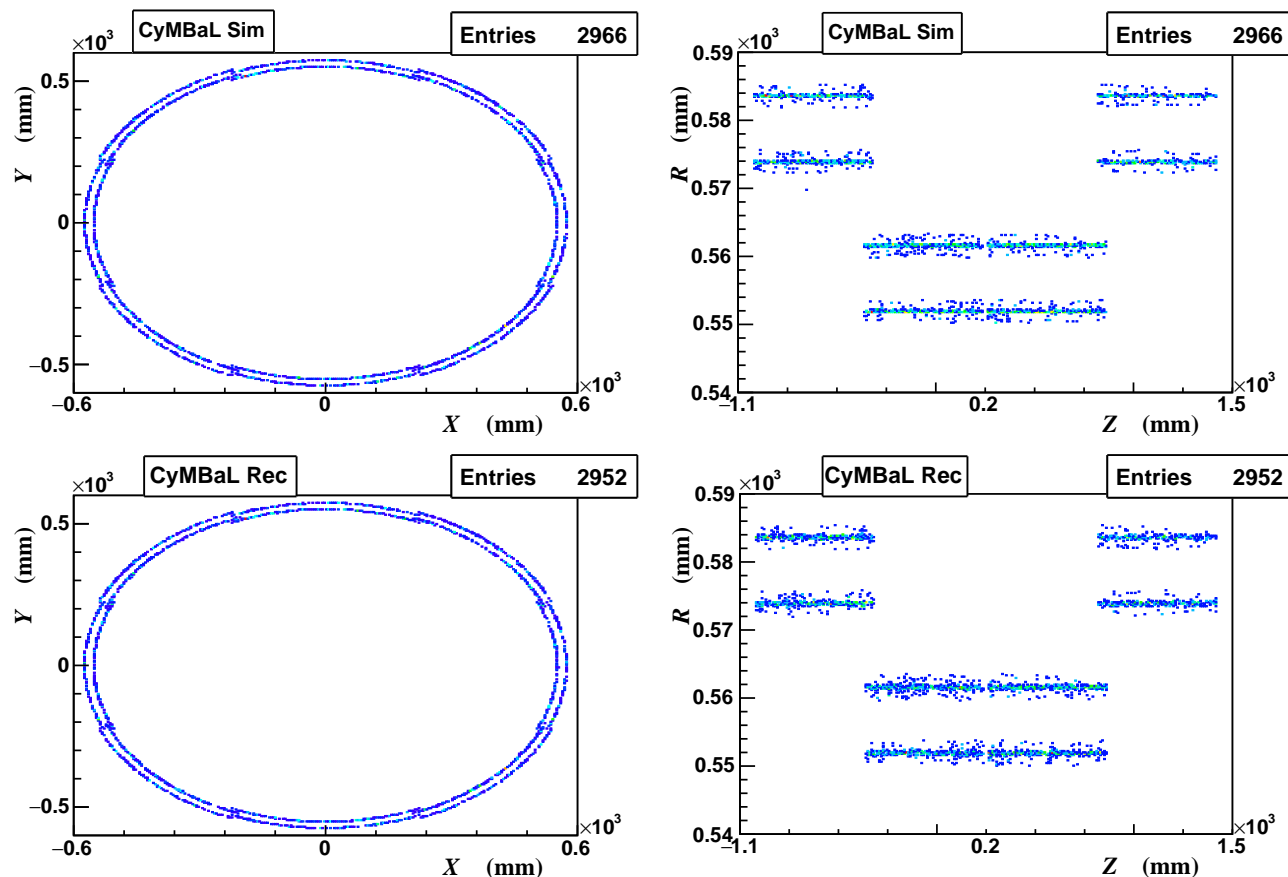
CEA/DPhN Saclay

17 June 2024

Processing

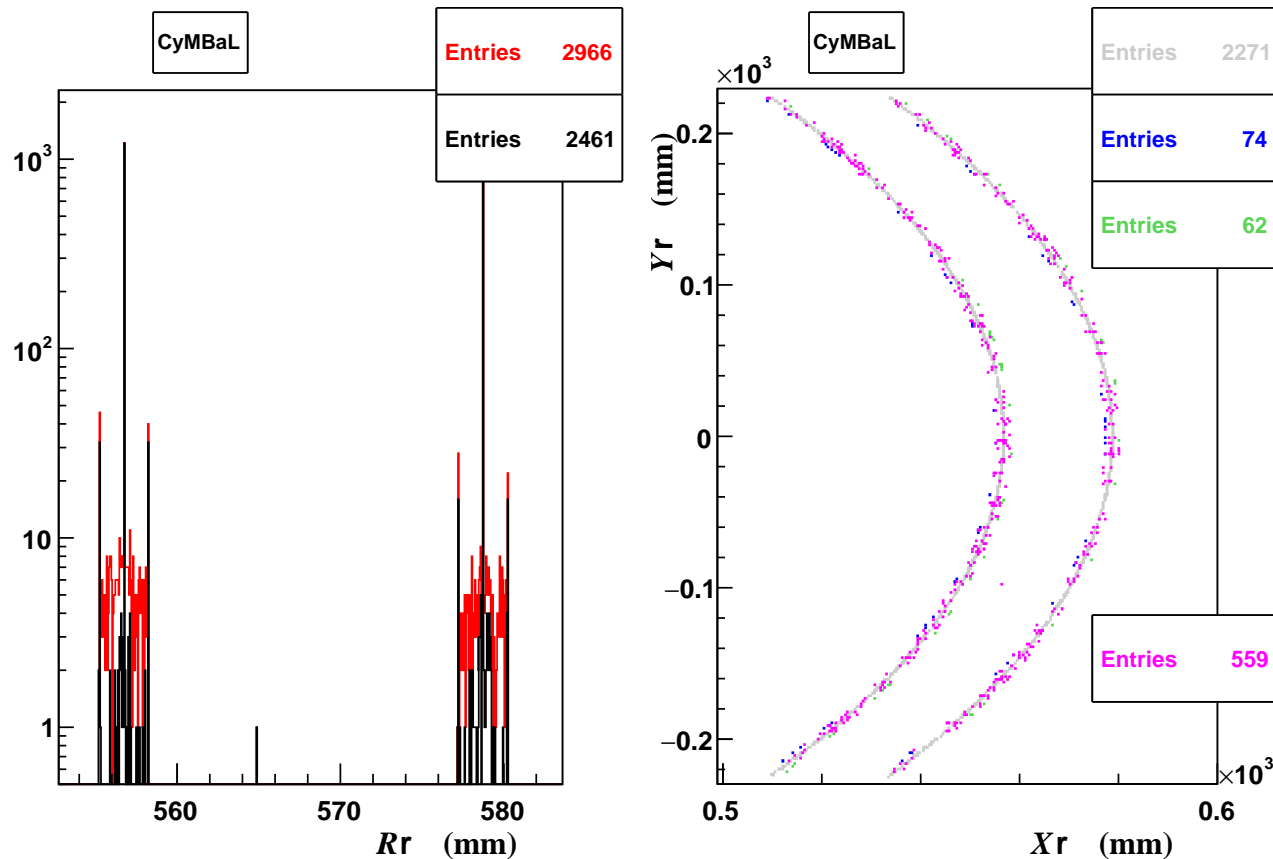
- Simulation
 - `ddsim --compactFile $DETECTOR_PATH/epic_craterlake_tracking_only.xml`
 - `SIM.gun μ^- 10 GeV $15 < \theta < 165$ deg`
- Reconstruction
 - `eicrecon`
 - `$DETECTOR_CONFIG.xml = epic.xml`

N.B.: `epic.xml` and `epic_craterlake_tracking_only.xml` must be consistent.



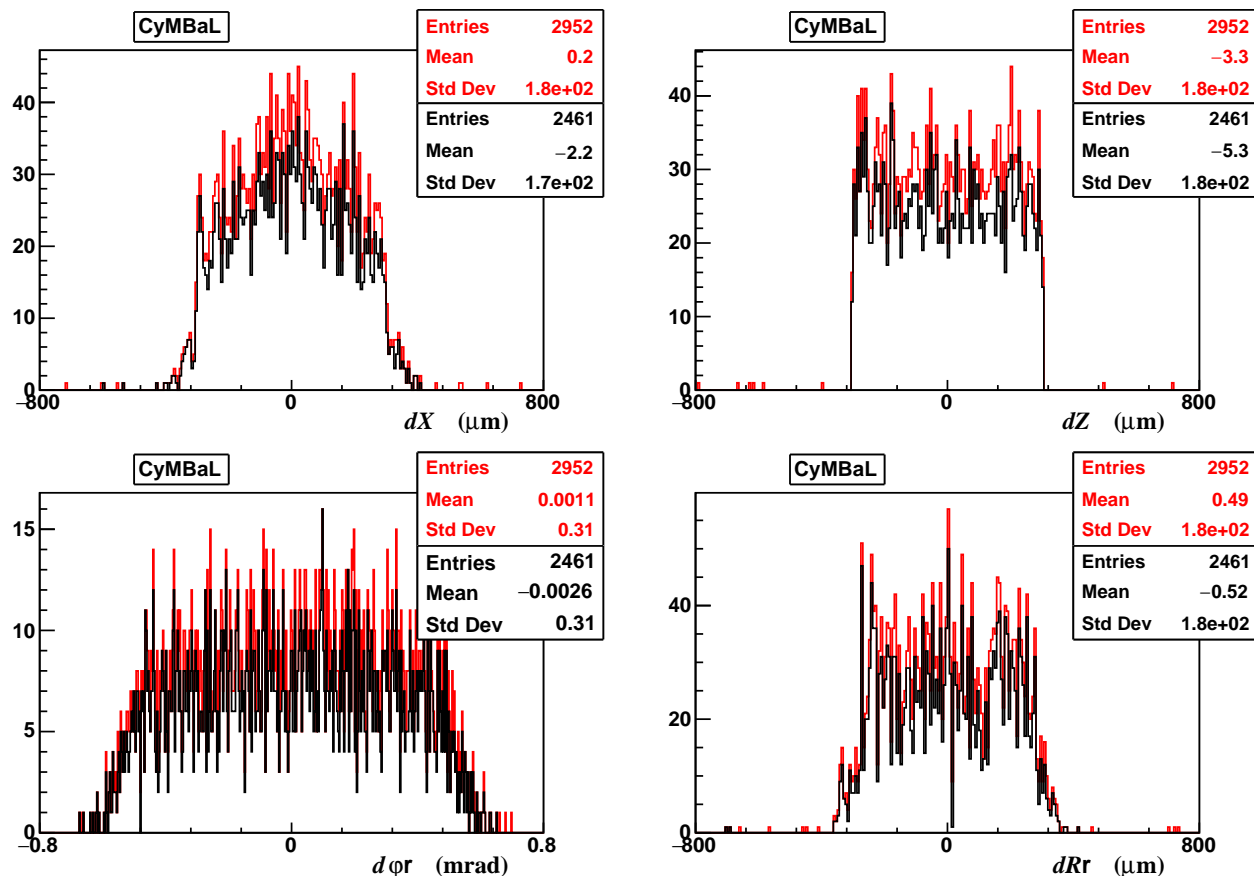
Problem I: CyMBaL SimTrackerHit

- At the level of SimTrackerHit, suspicious stray hits along R .
- Persist when *w.r.t* centre of curvature ($\rightarrow Rr$), where expected is a Dirac peak.
- Stray hits often of bad quality (SimTrackerHit::quality), see **All hits** *vs.* **good quality hits**.
- Stray hits uniformly distributed along φ



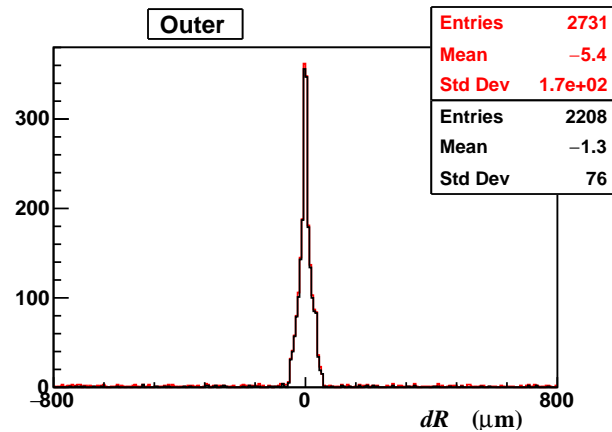
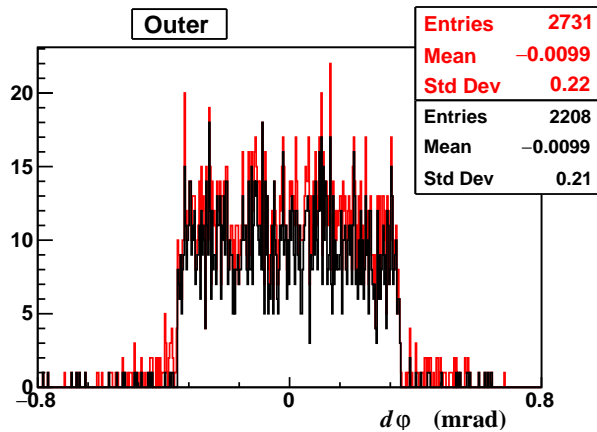
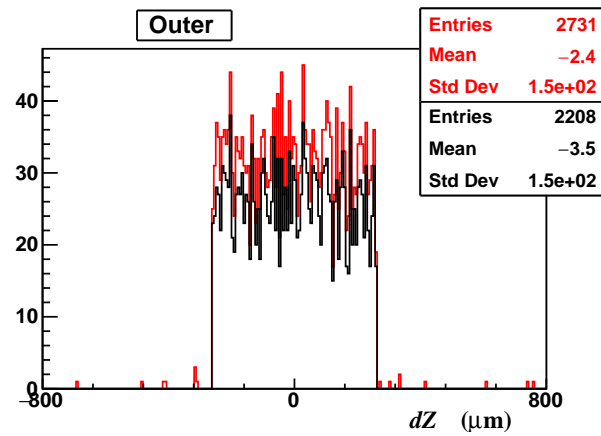
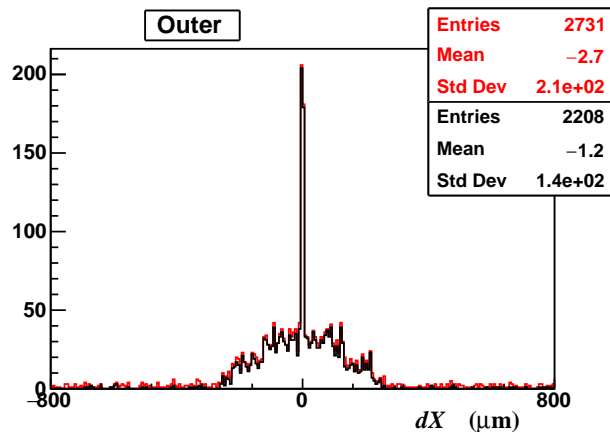
Problem II: MPGD Residuals

- Residuals = $d\mathbf{X}d\mathbf{Z} \dots = \text{Reconstructed} - \text{Simulated} = \text{TrackerHit} - \text{SimTrackerHit}$
- In podio TTree: MPGDBarrelRecHits - MPGDBarrelHits,
associated *via* MPGDBarrelHitAssociations_(raw|sim)Hit
- Expected: $d\mathbf{X} = \pm 175 \mu\text{m}$: fulfilled, $d\mathbf{R}r = \text{Dirac}$, not fulfilled



Problem II: OuterMPGD Residuals

- In Outer = μR_{well} , dX has a peak at 0, corresponding to vertical staves.
- Otherwise $dX = \pm 150 \mu m dR$ is reasonably Dirac (*In Outer, R is not a fixed value.*)



Problem II: SiBarrelVertex Residuals

- Also a peak in dX at 0: same probable explanation as for Outer.
- dR is a Dirac

