

VXD Simulation and Misalignment

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Outline

VXD misalignment

VXD simulation



VXD misalignment

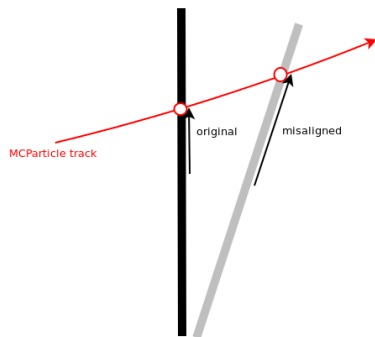


Figure : When geometry differs from expected, we observe shifts in measurements.

Misalignment

- Use a different geometry in simulation and reconstruct in nominal geometry to test alignment procedures.
- For economy, it is convenient to distort a simulation in nominal geometry to mimic a result with a distorted geometry
 - Simulate in nominal geometry
 - Shift hits on sensors to imitate a different geometry
- To apply misalignment, we need to:
 - Calculate the correction to 3D transformation for the sensor plane.
 - Calculate the shift of the cluster position (this requires MC information, as it depends on track direction)



VXD misalignment implementation

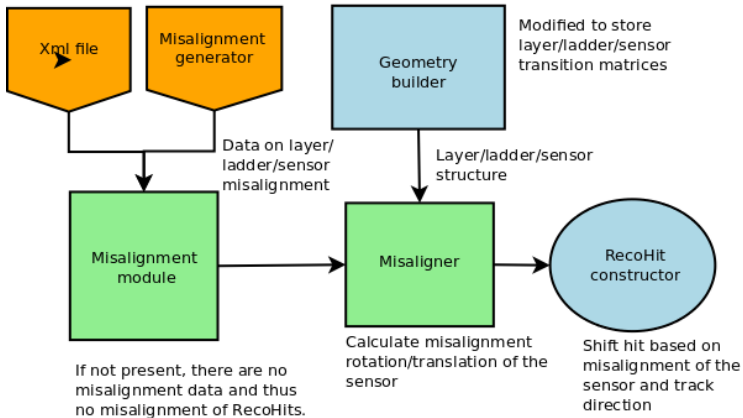
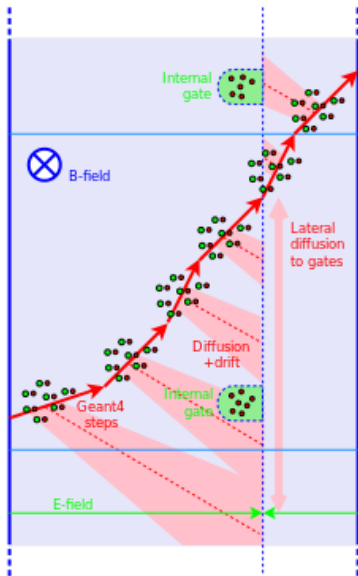


Figure : Misalignment implementation



VXD simulation



Data re-organization:

- Merge PXDSimHits to compound objects (Martin Ritter, summer 2014)
 - Merge Geant4 steps forming nearly linear segments into a single SimHit
 - Save detailed energy deposition profile along the segment



Figure : Simulation of charge transfer in a silicon

VXD simulation

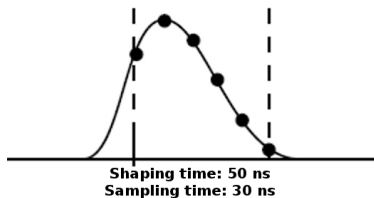


Figure : SVD APV25 samples taken in a single strip readout

Data re-organization:

- Merge SVDDigits to contain all APV25 waveform samples
 - 6 APV samples per SVD digit rather than one
 - Very, very backward incompatible.

SVD hit time reconstruction

- Determine SVD hit time from the waveform signals on clustered strips
- Tightly bound with SVD digits format, so waiting in the pipeline.



Conclusions

- VXD misalignment will be committed this week
- VXD simulation working, additional features are being added
- SVDDigit format will be changed after the B2GM to not interfere with analyses targeted to the conference.



Thanks

Thank you for attention.

