C3 Beam Background Studies

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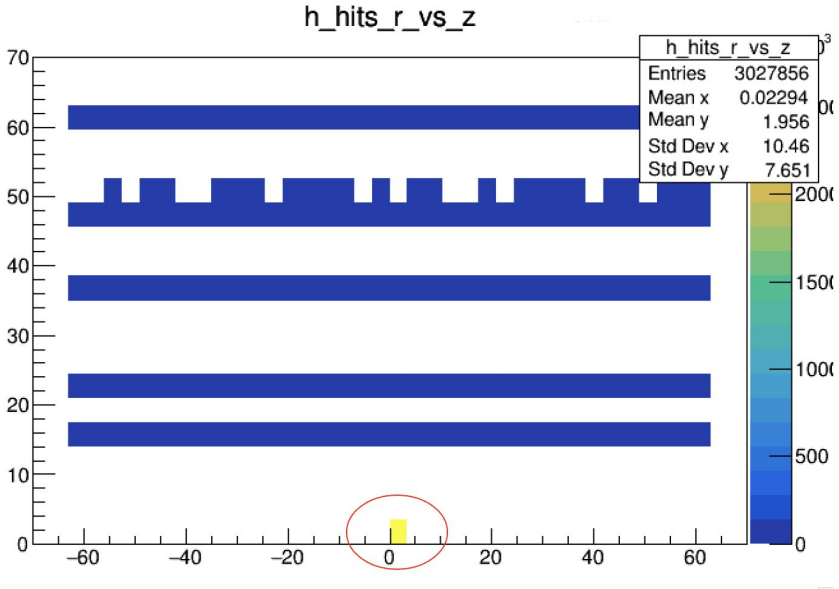
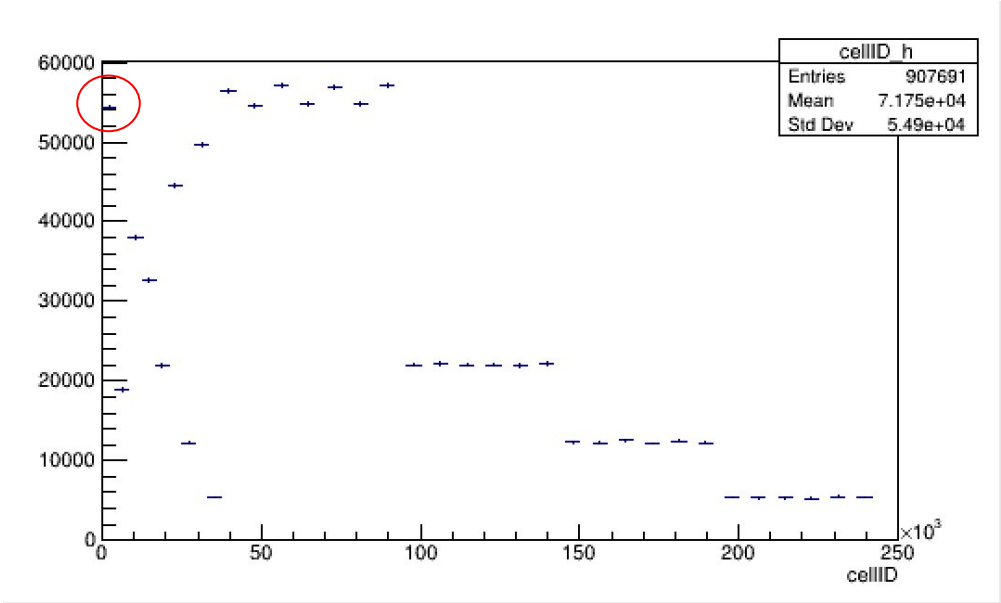
Large Amount of Hits at (0,0,0)

- Mentioned last week that we were looking into a couple bugs as explanation
- Two separate issues both centered around hits being assigned to detectors



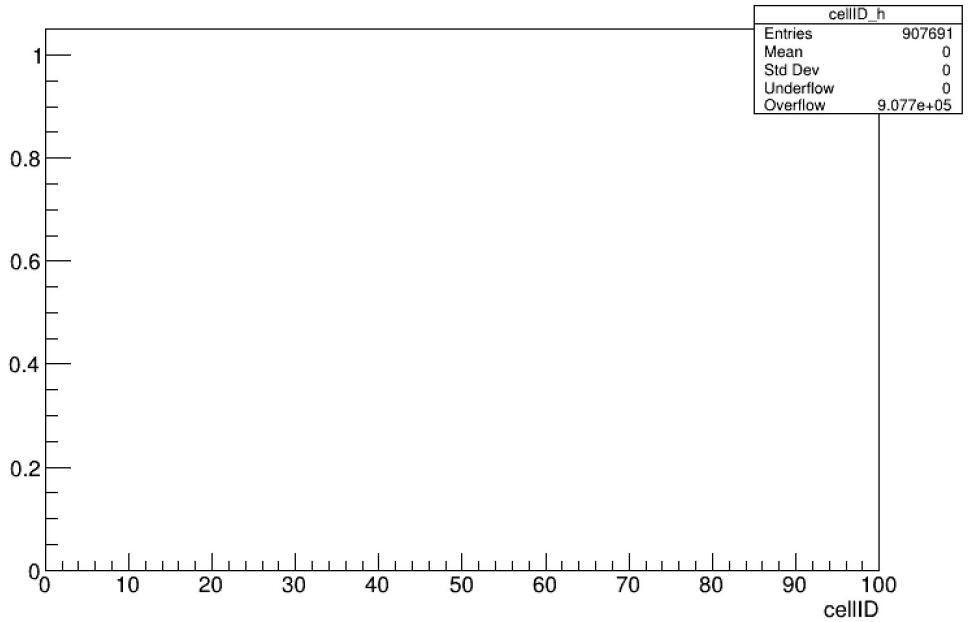
Possible Bug 1

- Each hit has a sensitive detector assigned to it
- If there is an error in the detector geometry, the hit could never be assigned
  - Placed at (0,0,0) when error is thrown
- If this is the case, there will be a substantial number of hits assigned to the Detector ID (cellID) “0”



Bug 1 - Disproved

- Closer inspection of the cellID data shows that no hits are assigned to the “0” cell at all
  - Must be something else



Possible Bug 2

- Error in geometry and setup of the detectors
- Detectors are overlapping each other (on their edges) in violation of 3D space
  - When a hit land on the overlapping edge, it can’t be assigned to two separate detector cells
  - Error is thrown placing the hit nowhere (0,0,0) instead
- Uncertain yet on exactly how to verify

Next Steps

- Previous ideas (Fake Hits, high-p low-angle, etc) have been placed on hold to try and verify this second bug
- If this bug is the issue, we will have to fix it and run at least one new bunch train worth of data
- If this can’t be verified, turn back to previous ideas/move on