Brookhaven National Laboratory

U.S. DEPARTMENT OF ENERGY

Still Implementing a Drift Chamber in DD4hep

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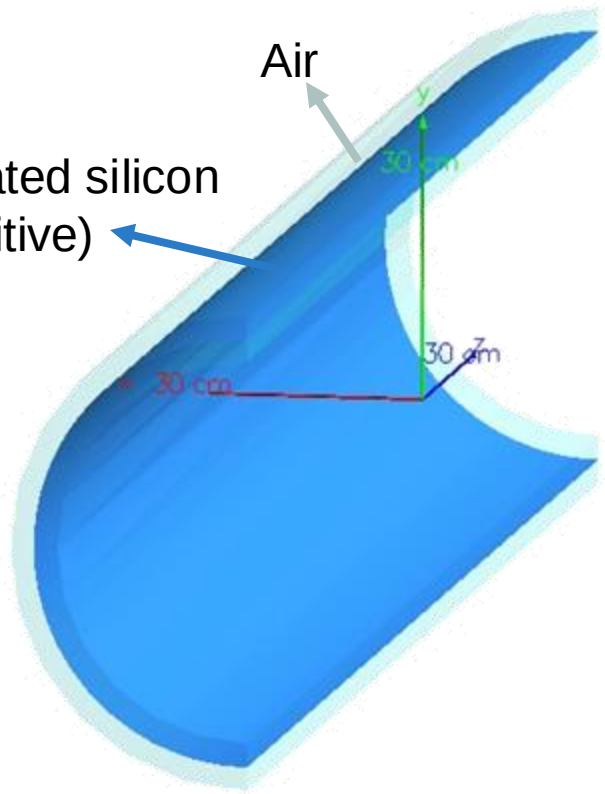
Recap

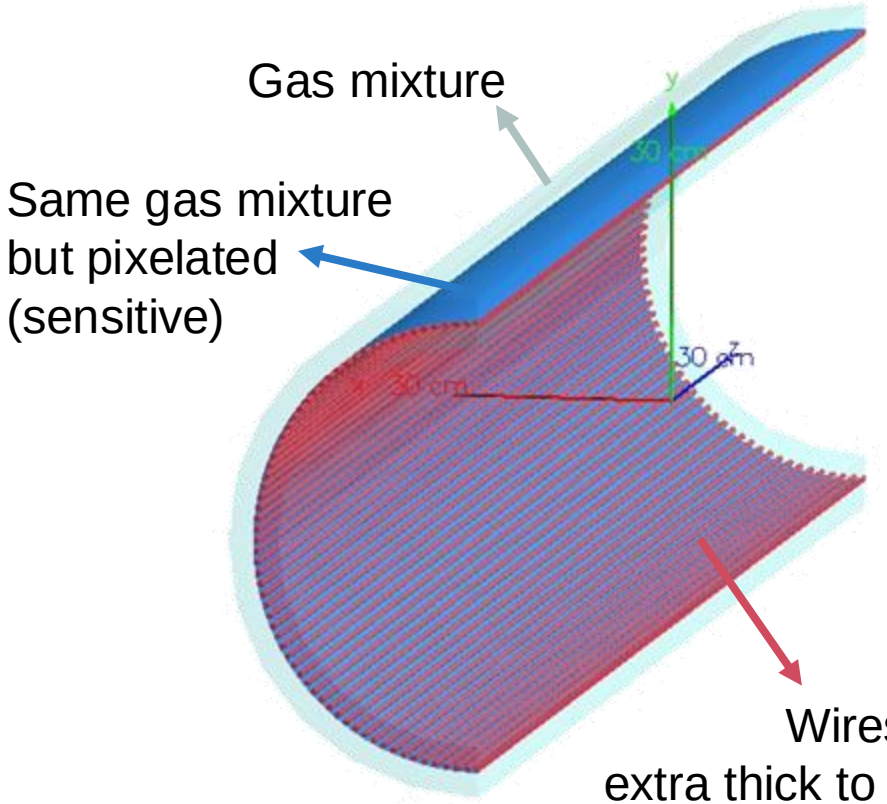
- Implemented IDEA drift chamber
- Goal is to estimate the tracking performance using ACTS
  - Demonstrate better tracking efficiency for pattern recognition
  - Only consider material budget
  - Without the effects of drift time, diffusion, and left-right ambiguity
- I am stuck at registering the drift chamber in ACTS for track reconstruction
- My attempts
  - Emailed the ACTS expert. But the expert said that he/she didn't find anything wrong in the code
  - Talked to Shujie. She provided some suggestions, but none of the suggestions solve the issue
  - I am going to talk to the ACTS expert tomorrow.
  - While I am waiting for tomorrow, I am trying an alternative: convert the barrel silicon layer to a drift chamber

Convert a Barrel Silicon Detector to a Drift Chamber

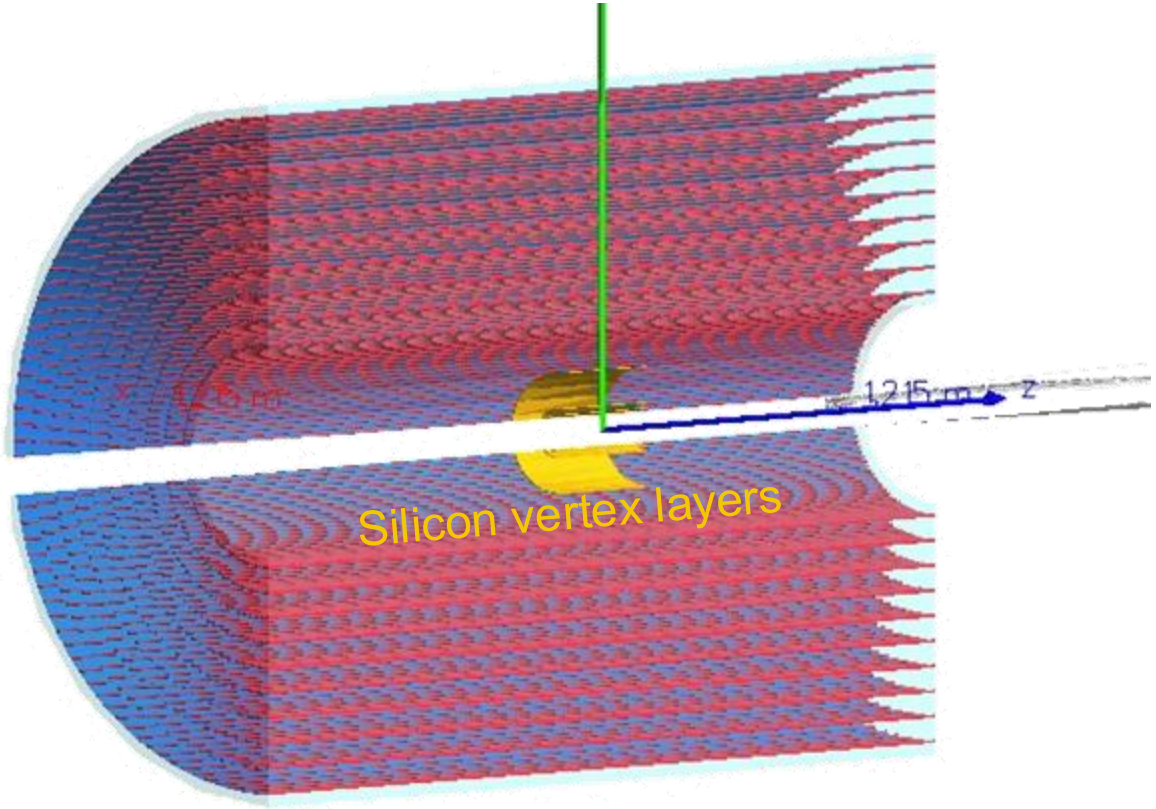
ePIC barrel silicon vertex layer



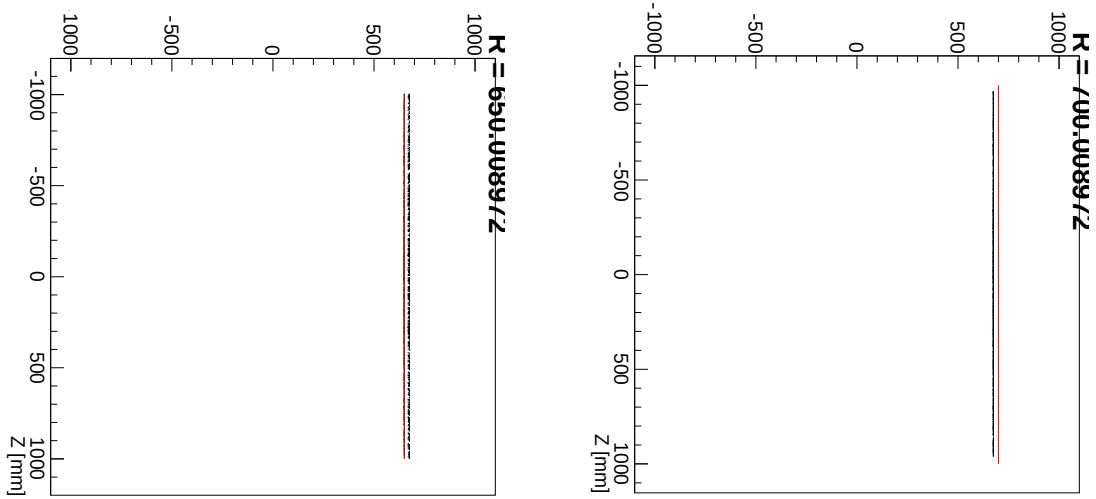
Drift Chamber



10 Layers of the Drift Chamber



The drift chamber is now recognizable when generating the material maps!



- The outer layer of the drift chamber
- Red lines: approaches at the bottom and the top of the sensitive gas

To-Do List

- Implement mesh of wires (sensor wire and field wires) in each layer
- Implement vessel of the entire drift chamber