

My Takeaway from Straw Tracker Mini-Workshop

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Straw Tracker Mini-Workshop

14 – 15 October at Ann Arbor. <https://indico.cern.ch/event/1408681/>

Experience from experiments (not necessarily straw tube)

- GlueX
- NA62
- SAND
- ATLAS TRT
- Mu2e
- Belle-II
- MEG-II

Technology development such as

- Winding and welding
- Self-support from over pressure
- Thin film ~ 8 μm Mylar
- Readout electronics

What was not discussed

- Why use straw tubes for Higgs Factory main tracker?

My Points at the Workshop

Drift chamber likely to have less material than all-silicon tracker, and should be considered for HF main tracker.

Straw tube may not be the best approach to realize it.

- For straw material to be less than wires defining a similar cell geometry, it needs to be very thin. So thin as to be impractical, at least at present.
- Each straw is intrinsically a single-hit sensor. Two-track resolution (in transverse plane) ~ 1 cm depending on design details.
 - Lose hits for additional tracks, especially likely for smaller radius.
 - Lose PID information for all tracks in that tube, because clusters or charge cannot be assigned to the right track

Jet cells a la LEP and SLD can be superior

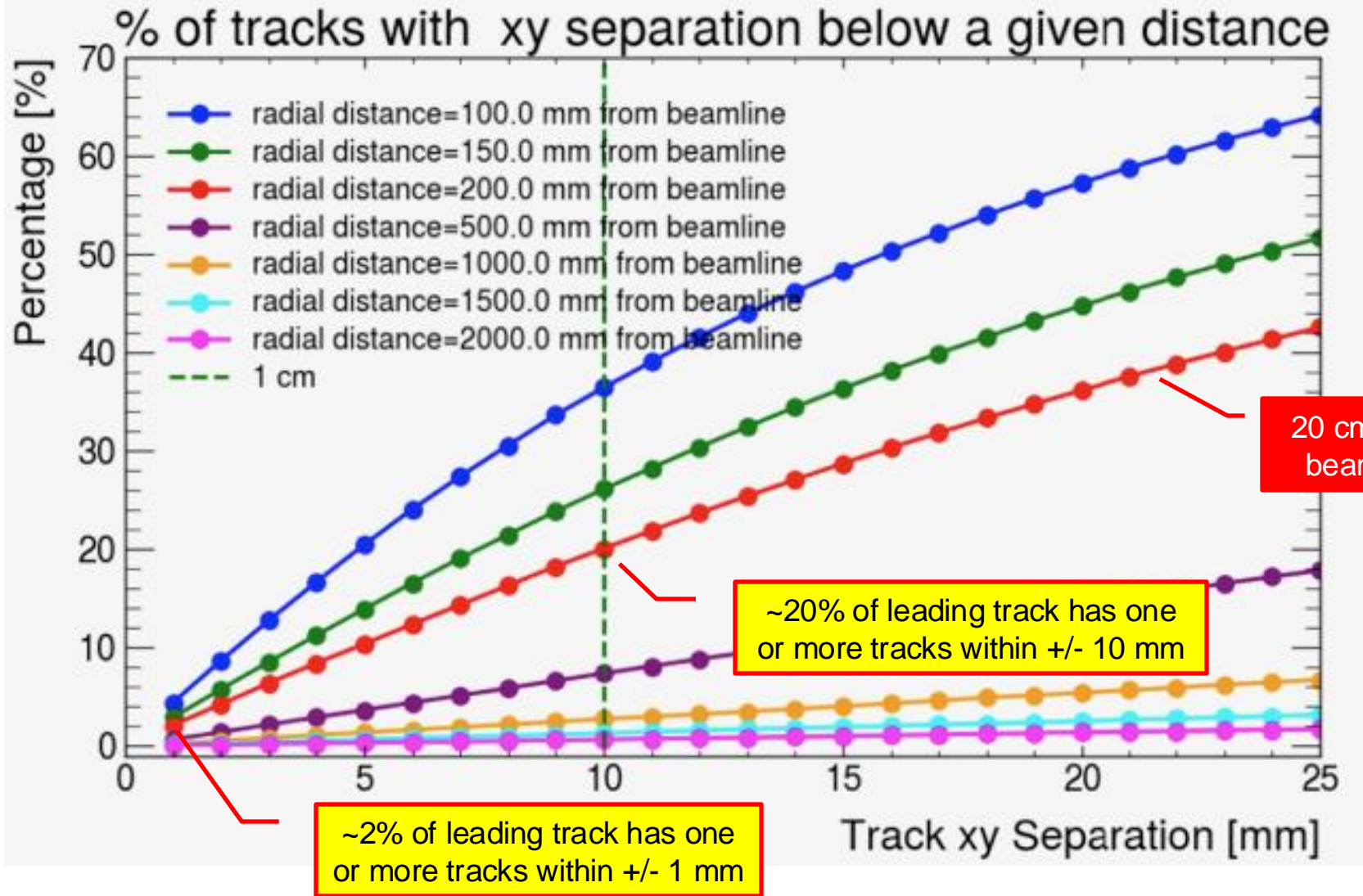
- Double track resolution of ~ 1 mm
- dE/dx information, while not as powerful as dN/dx , is available for all (resolved) track hits.

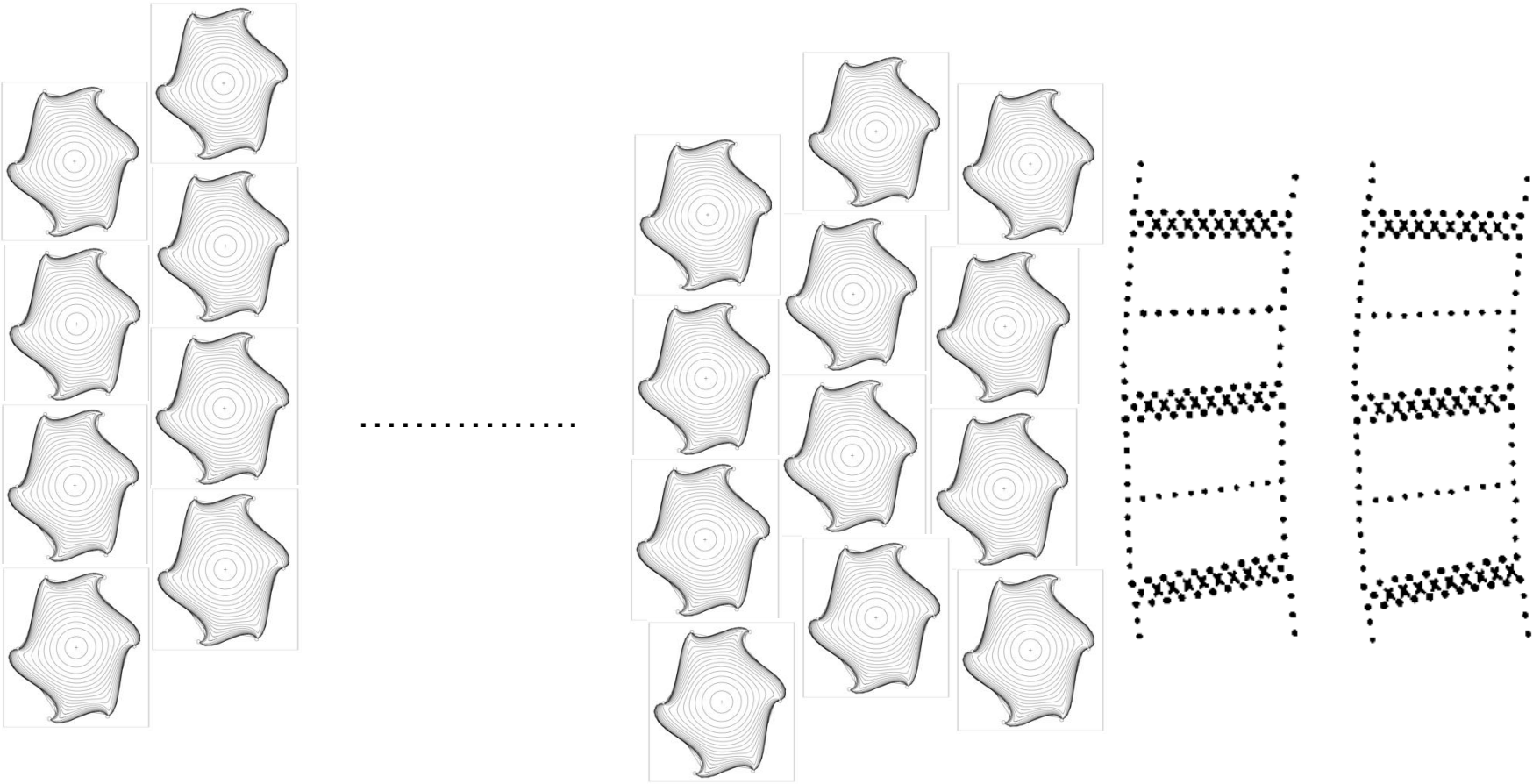
Investigate drift chamber geometry possibilities for best physics performance.

Does Cell Geometry Matter?

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large r

small r