Pair Spectrometer Detectors

Z ~ -65 m

e^-

e^+

$-\hat{Z}$
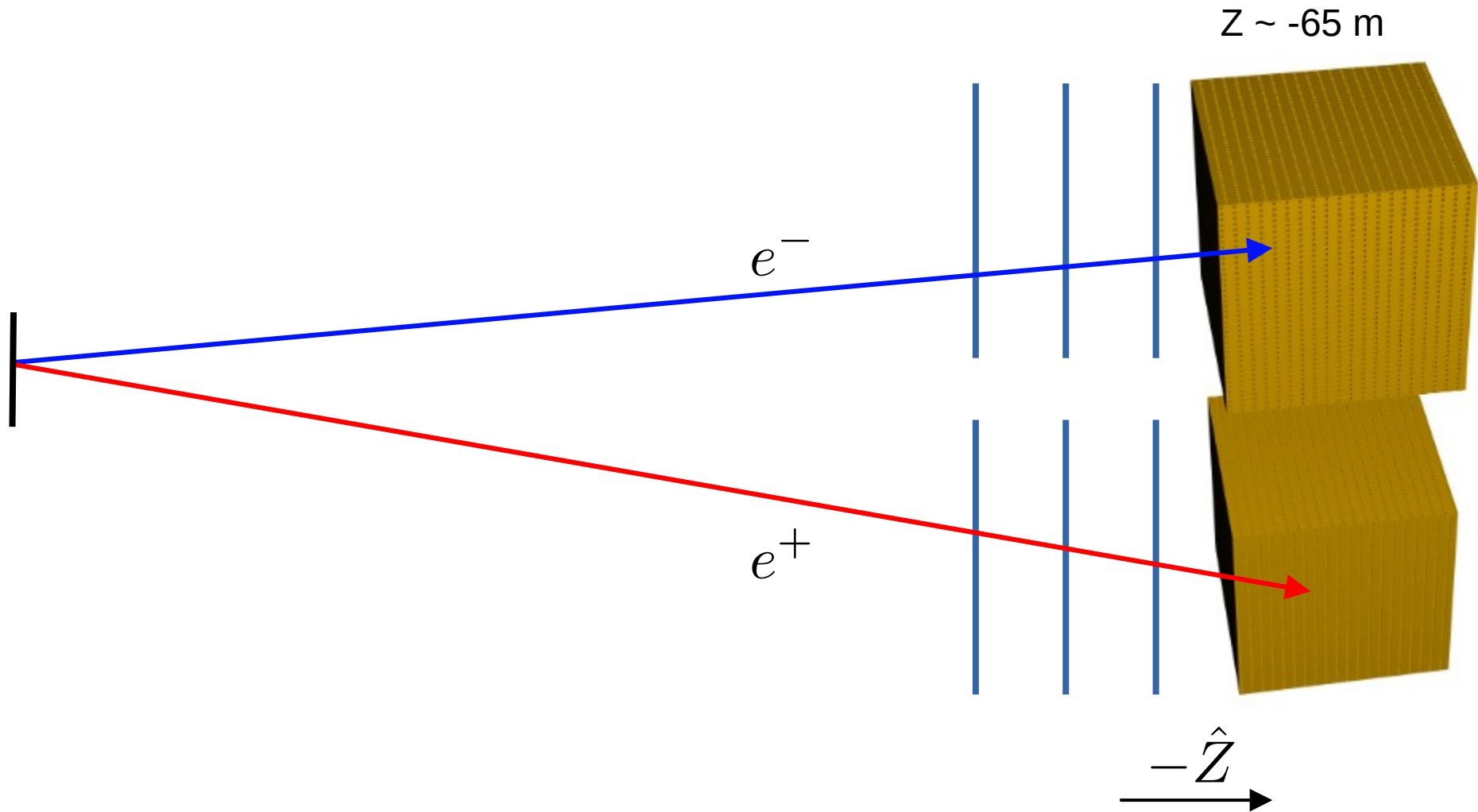
Pair Spectrometer Detectors

2 Detector arms: top and bottom.

Tracking Planes (3 planes):
- Technology choice not decided yet
  - AC-LGAD might be too course grained.
  - MAPS might be too slow in their integration time.
  - TimePix might be appropriate as the low-Q2 taggers will employ them as well.

Calorimeters:
- W SciFi is the preferred technology choice.
  - Robust and fast. ~15%/Sqrt(E) is good enough.
  - Design is not decided yet (fiber orientations).
  - Might be beneficial to use similar designs across multiple DSCs: low Q2 CAL? B0 ECAL? Forward ECAL?
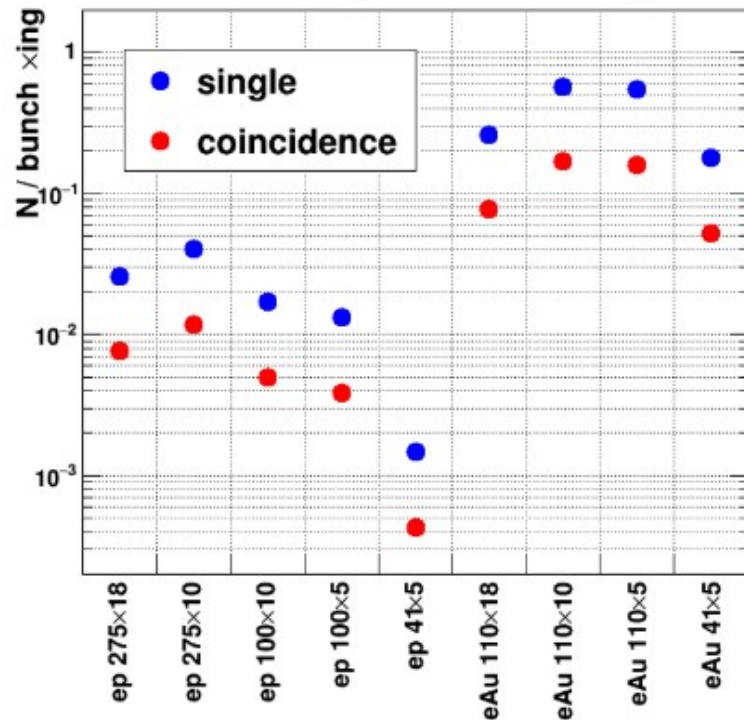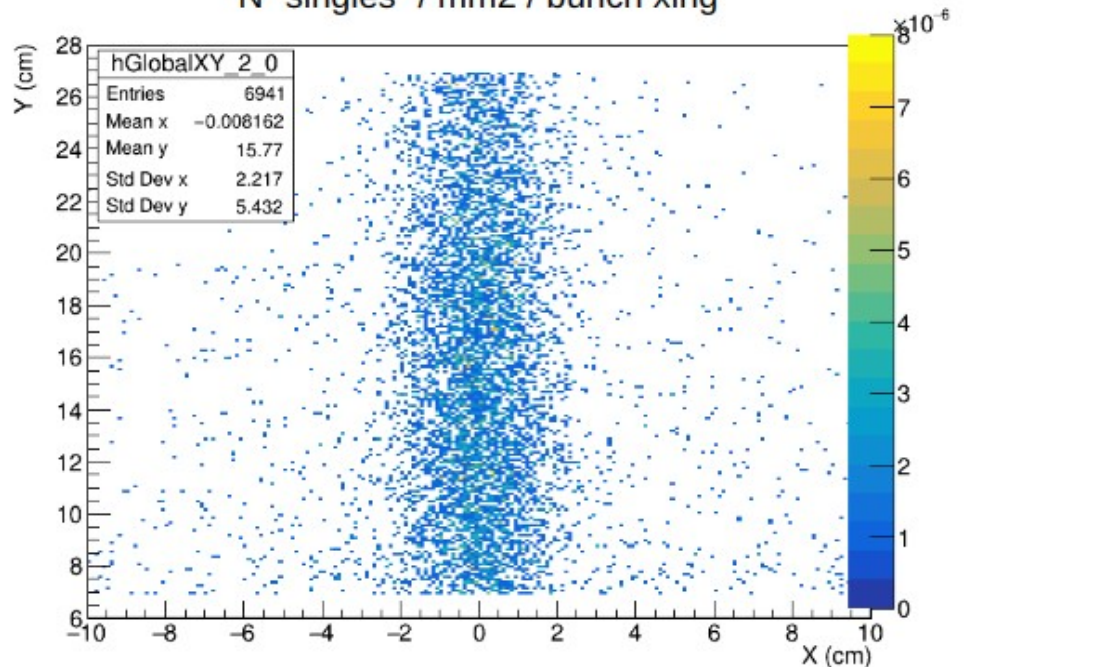
Tracking Planes

CAL
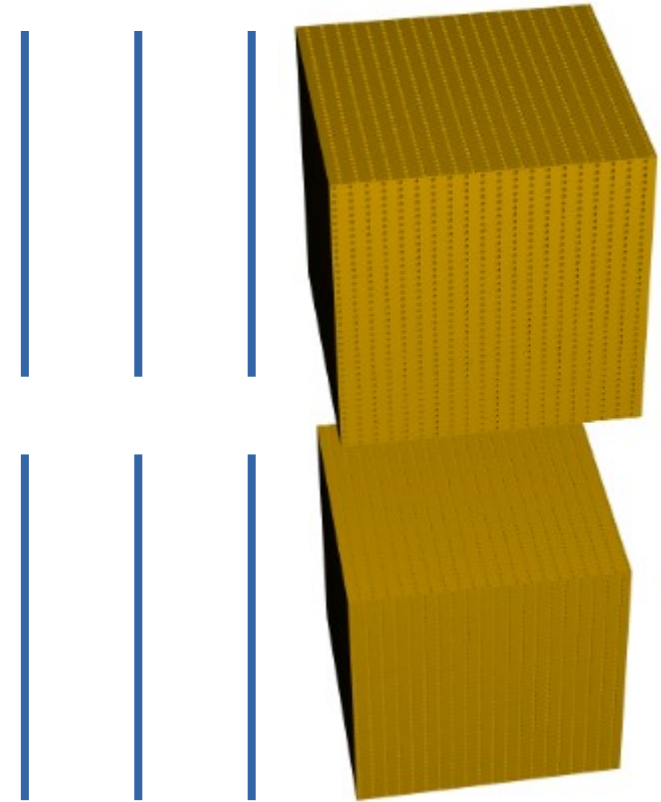
Expected Rates

Overall rates given current design

Differential rates for ep 275x18 (top trackers): N "singles" / mm2 / bunch xing

Includes beam effects

CALs:

- Moliere radius defines the granularity of the readout (~ 2 cm). Two CALs of 20cm x 20cm yields 200 readout channels.
- Differential rate per 2cm x 2cm readout channel:
  For ep 275x18 it is < 1e-3 per bunch xing.
  For eA 110x10 it is < 2e-2 per bunch xing.

Trackers:

- Rates per pixel are tiny. MAPS sensors with small material budget and ~1 μsec integration times might be feasible.