SoLID simulation with GEMC update

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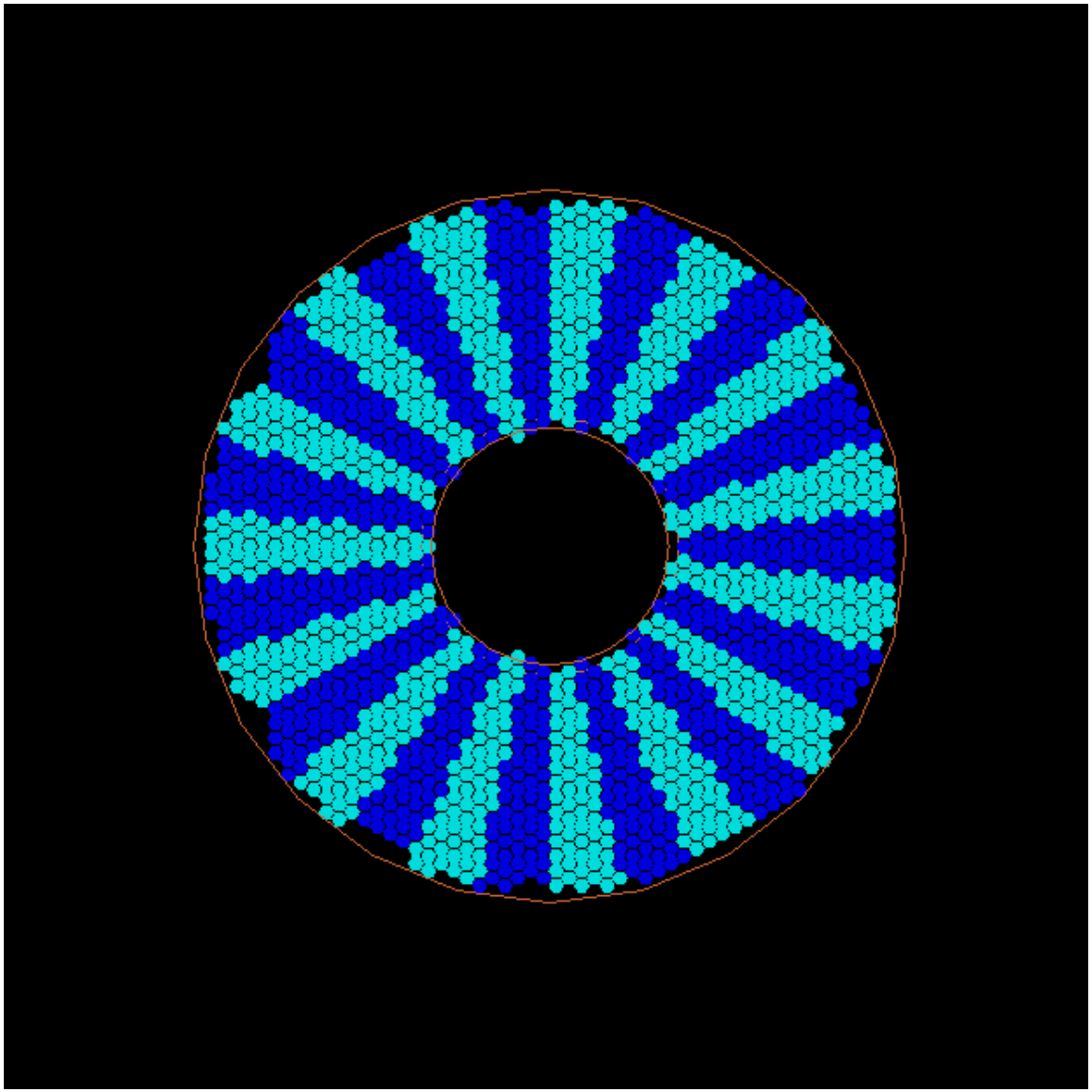
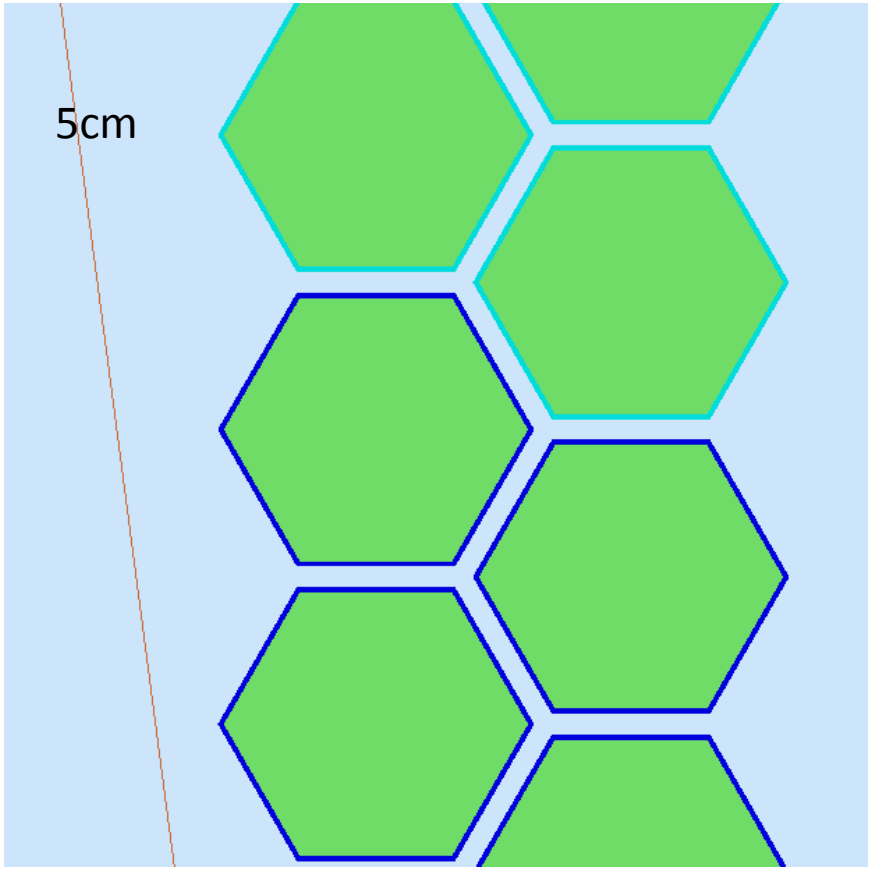
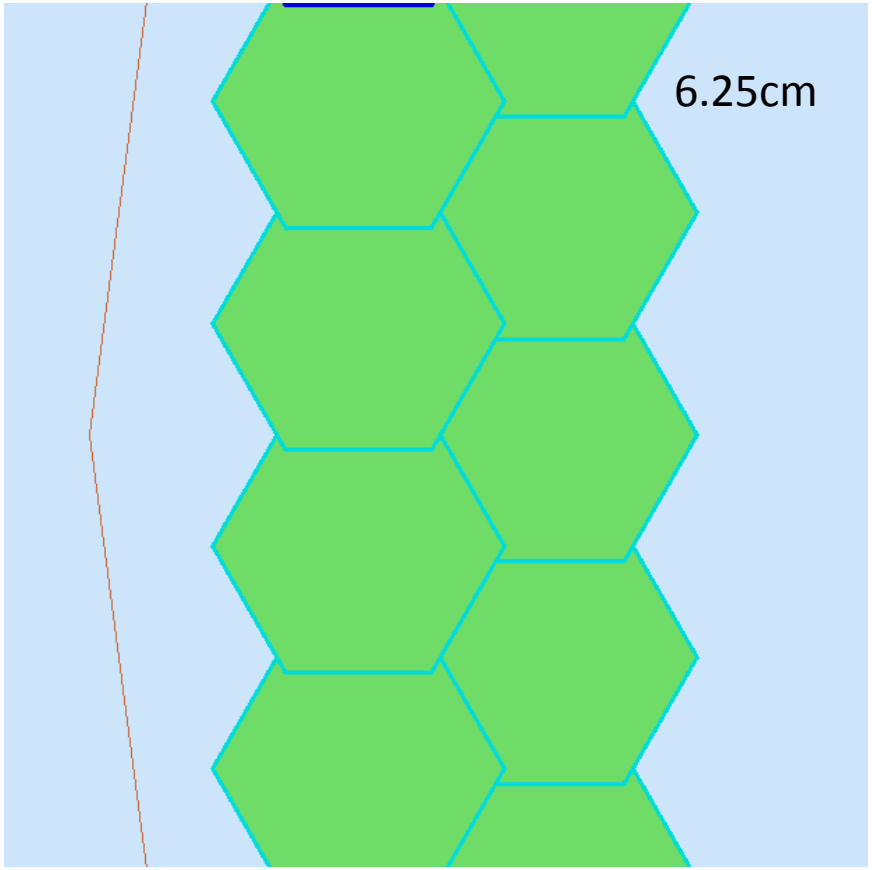
FAEC in simulation with layout from ANL



EC module size and layout

- Use ANL layout, 5cm edge modules look ok, but 6.25cm edge modules have overlap
- Our default module design is 6.25cm
- FAEC layout needs to change, LAEC layout is still missing





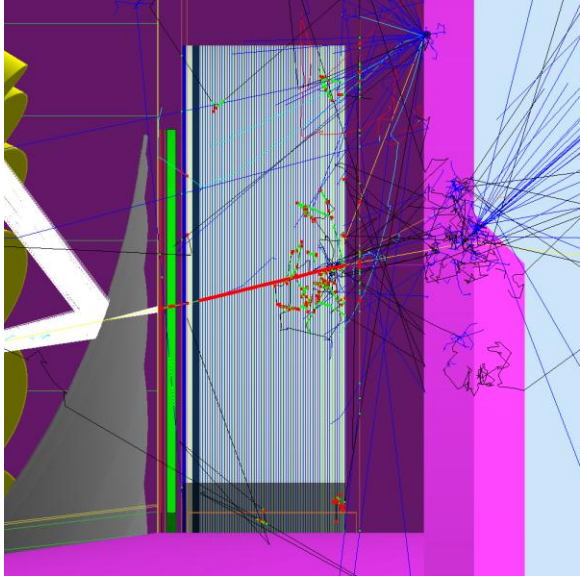
SIDIS hadron trigger

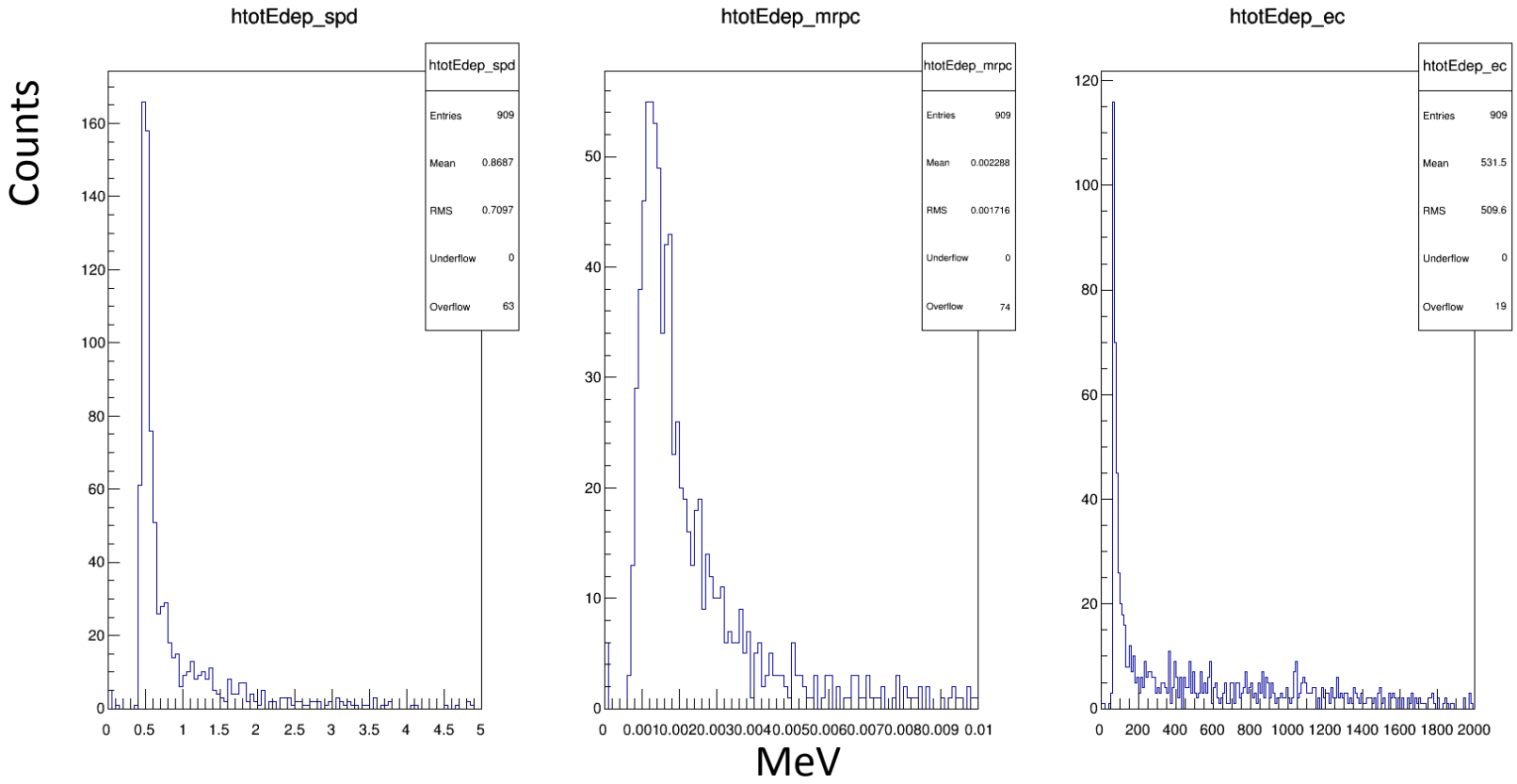
- To record all hadron (mainly pion)
- Dominate by charge pions and gamma from pi0
- Previous trigger rate estimation 14MHz for SIDIS He3
- Trigger is made of
  - EC cut below MIP to reserve hadron and suppress low energy background
  - SPD and MRPC anti-cut below MIP to reject gamma

- A simple test with full SoLID simulation under conditions:
  - Incoming particles evenly distributed within 1-11GeV
  - No background yet

pi- energy deposition

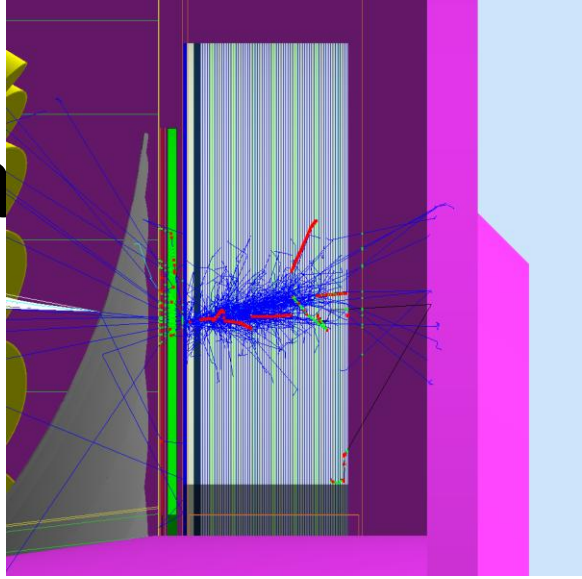
- MIP in all three detectors

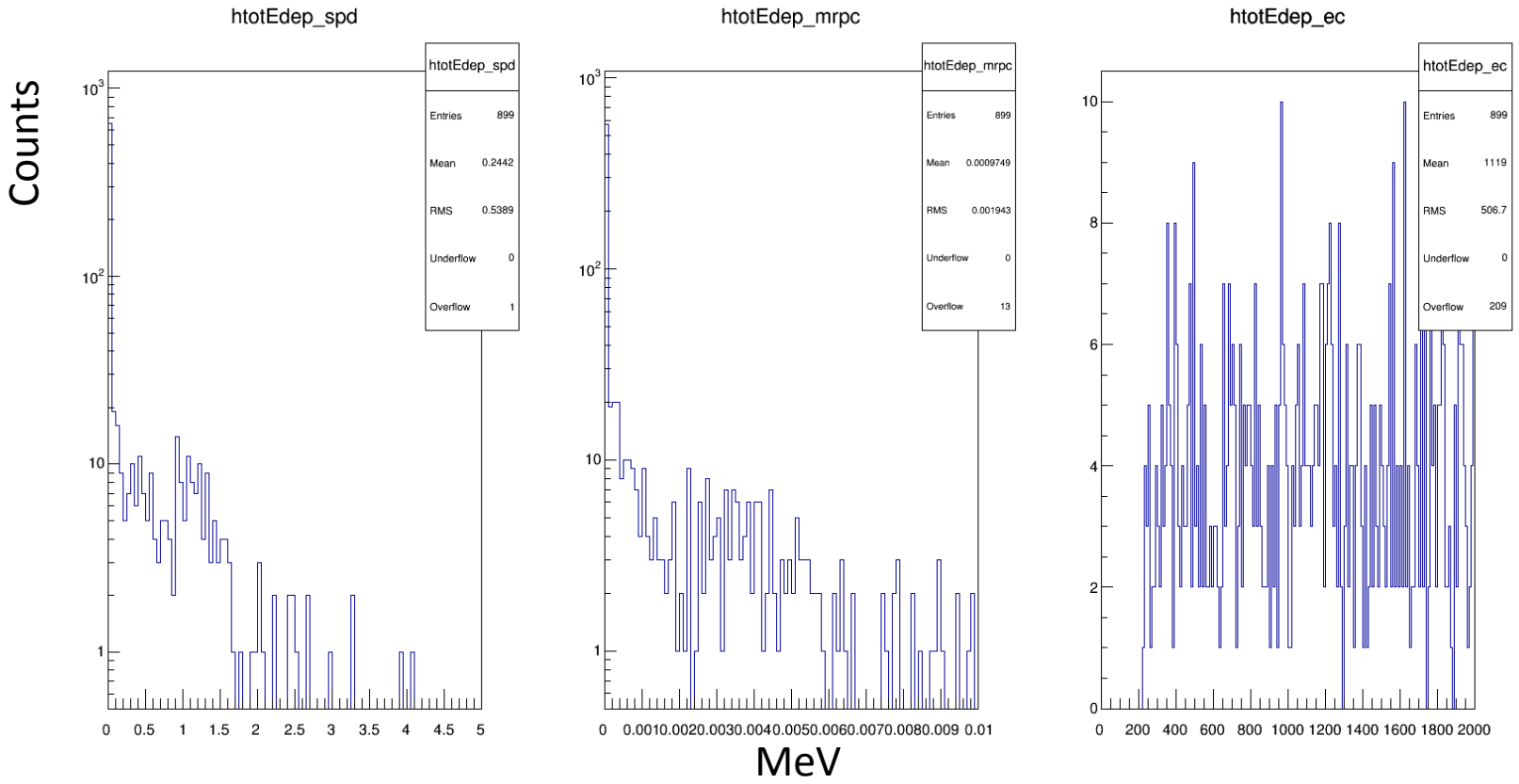




gamma energy deposition

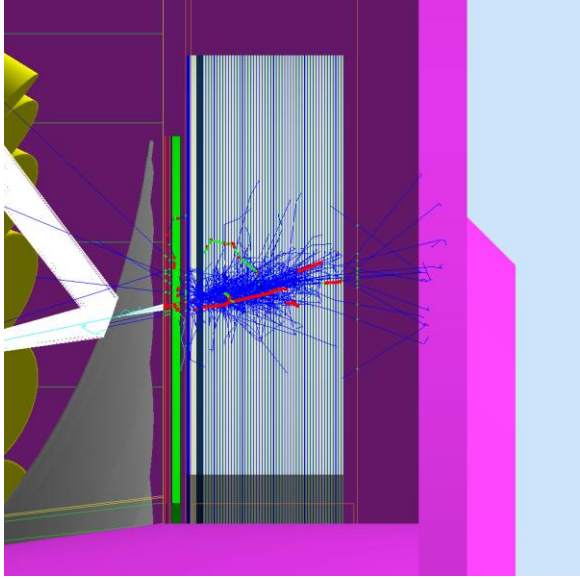
- Full energy deposition in EC
- Mostly no energy in SPD and MRPC

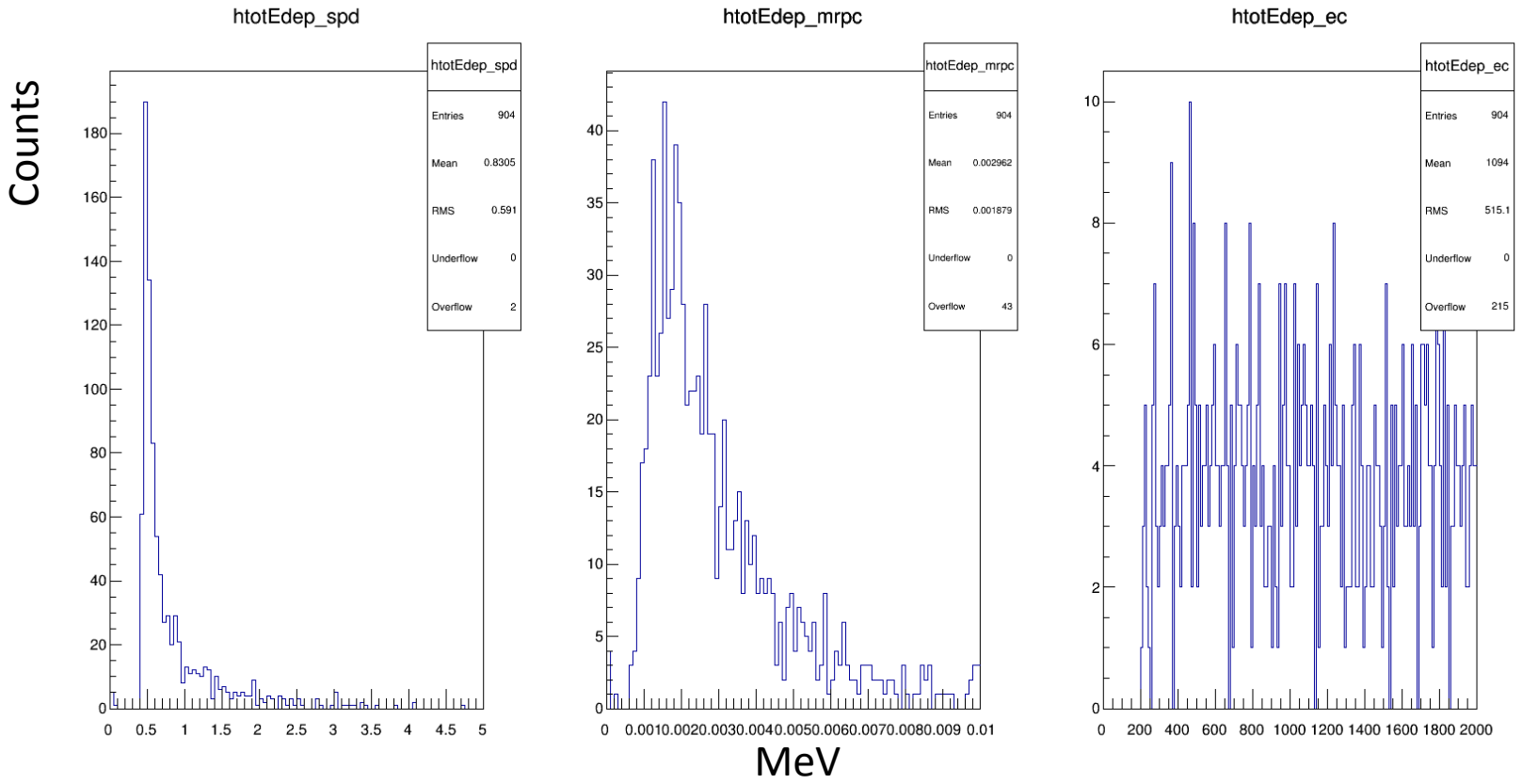




e- energy deposition

- Full energy deposition in EC
- MIP in SPD and MRPC





Trigger estimation (just an exercise)

unit in percent

Logic for gamma

incoming	EC yes && SPD no	EC yes && MRPC no	SPD no && MRPC no	EC yes && (SPD no || MRPC no)
pi-	0.44	0.44	0.66	0.44
gamma	79	71	65	85
e-	0.67	0.55	0.55	0.67

Logic for hadron

incoming	EC yes && SPD yes	EC yes && MRPC yes	SPD yes && MRPC yes	EC yes && (SPD yes && MRPC yes)
pi-	99.6	99.6	99.6	99.6
gamma	21	29	15	15
e-	99.3	99.3	99.3	99.3

pi- detection ~100%
gamma rejection factor 6.6, No electron rejection