

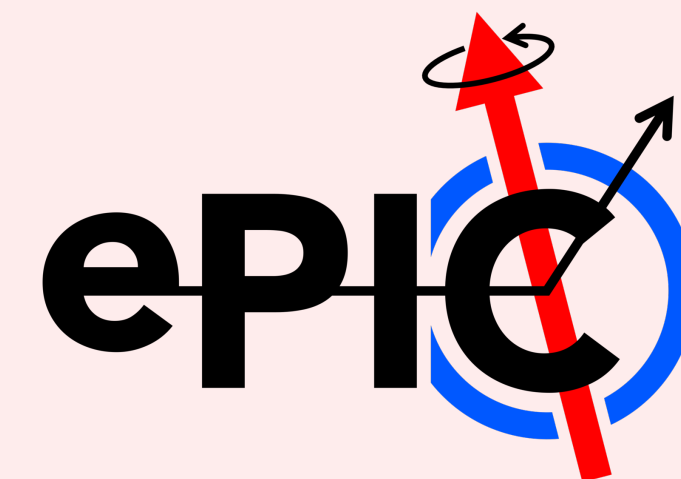
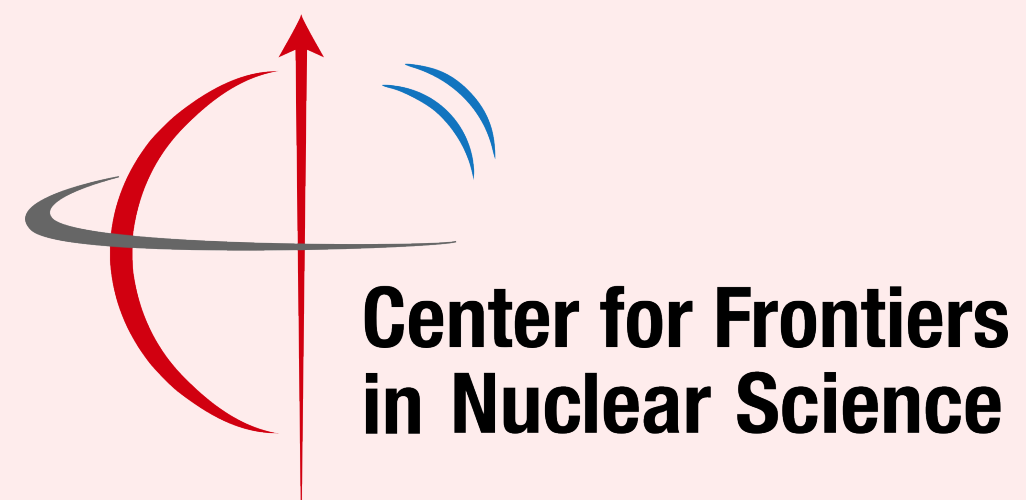
# Some initial analysis on the double spectator tagging for eHe3

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eA study group meeting

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- Use BeAGLE to generate  $e + {}^3\text{He}$  scattering events
- Use eicsmear to convert data format
- Use afterburner to add crossing angle and beam smearing

Using eAu config

- epic simulation:

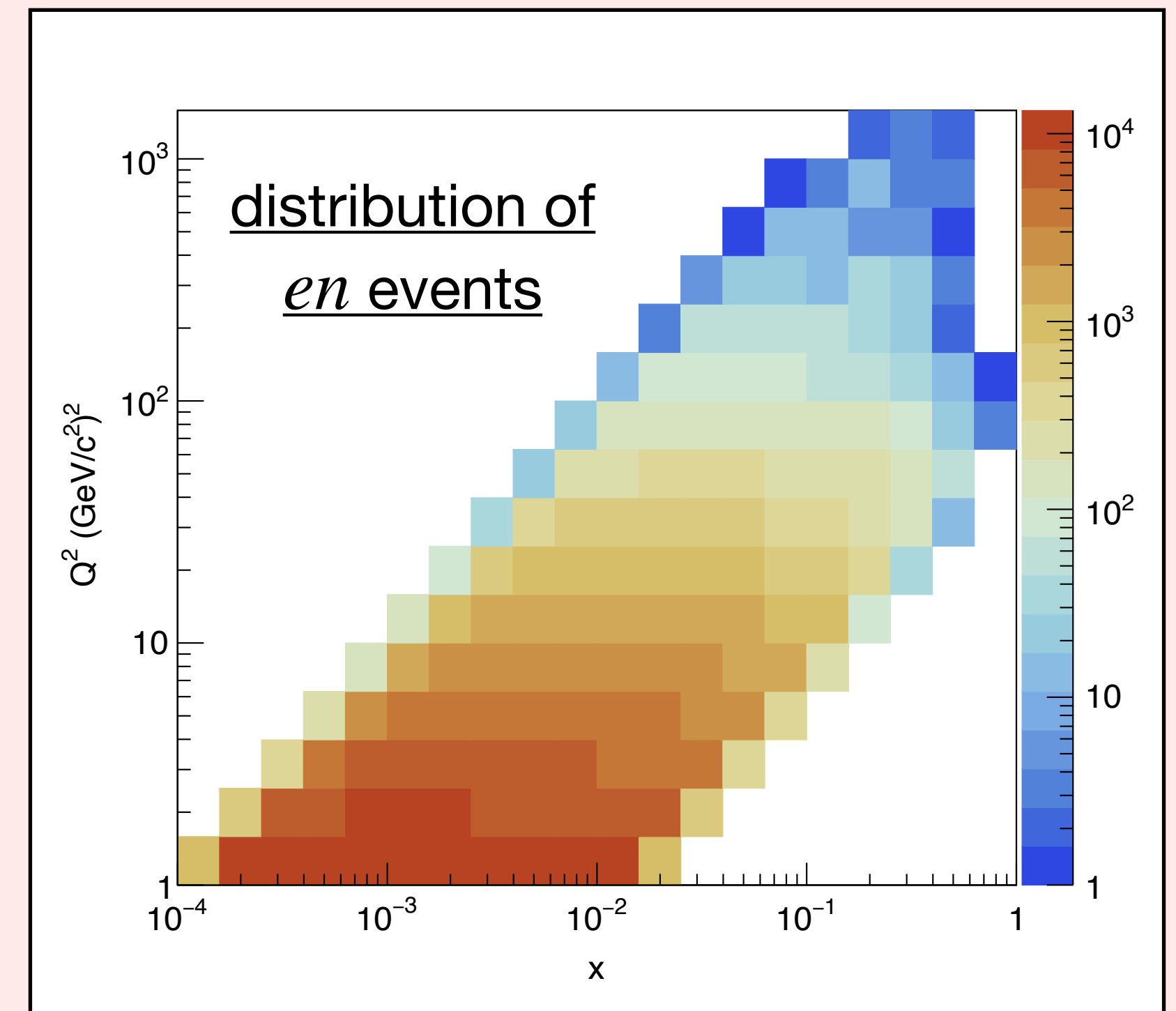
epic\_craterlake, Initialization time: 309.589417869 s, Per event time: 6.24880 s

- eicrecon error ...

Reconstruction of He3 breakup is not ready in the Roman pots and Off-momentum detectors  
So for now ...check number of hits in RP and OMD for the proton double tagged events

- (Send request to the simulation team to generate large data set)
- Analysis

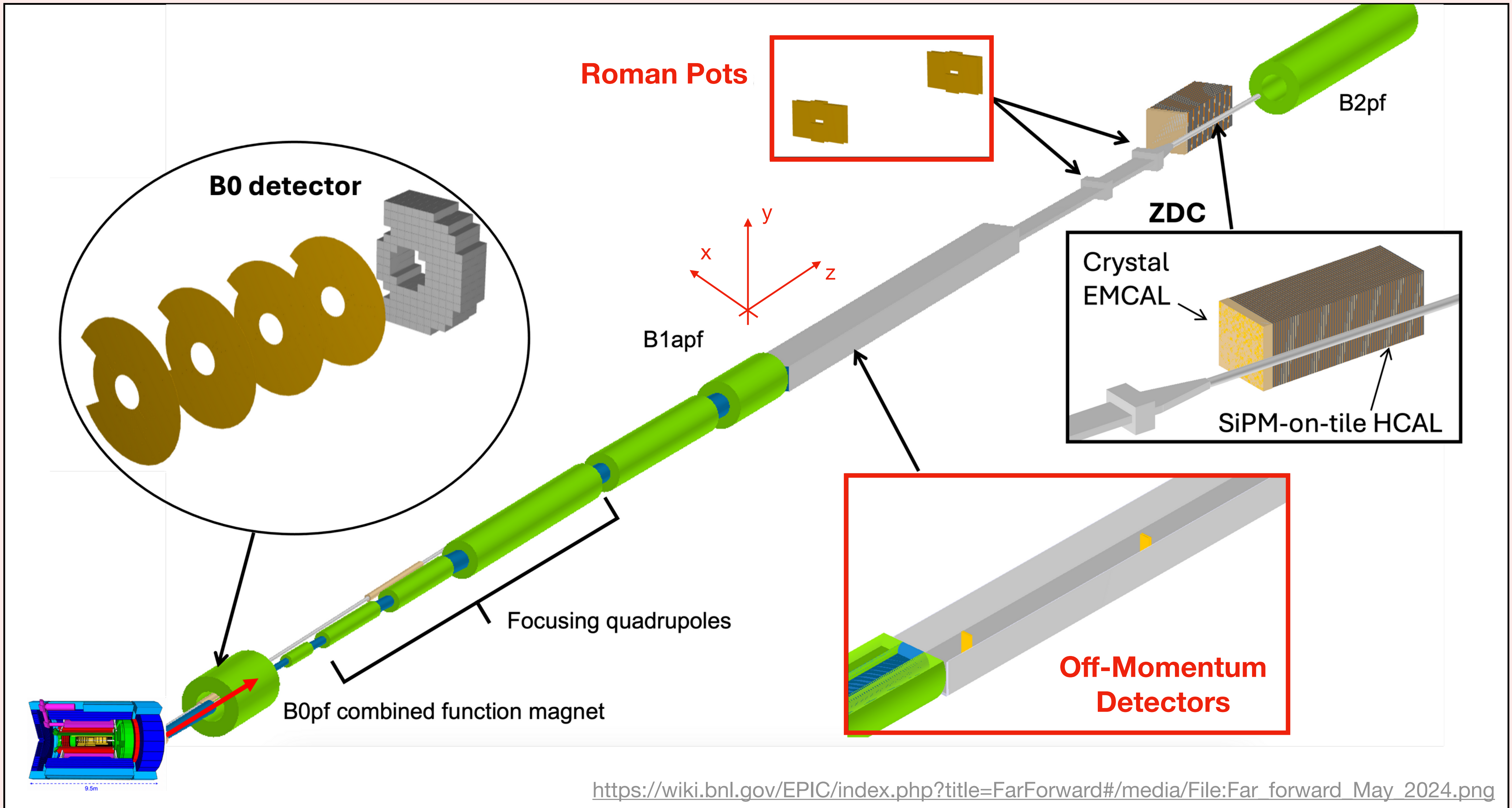
## BeAGLE $e + {}^3\text{He}$ :



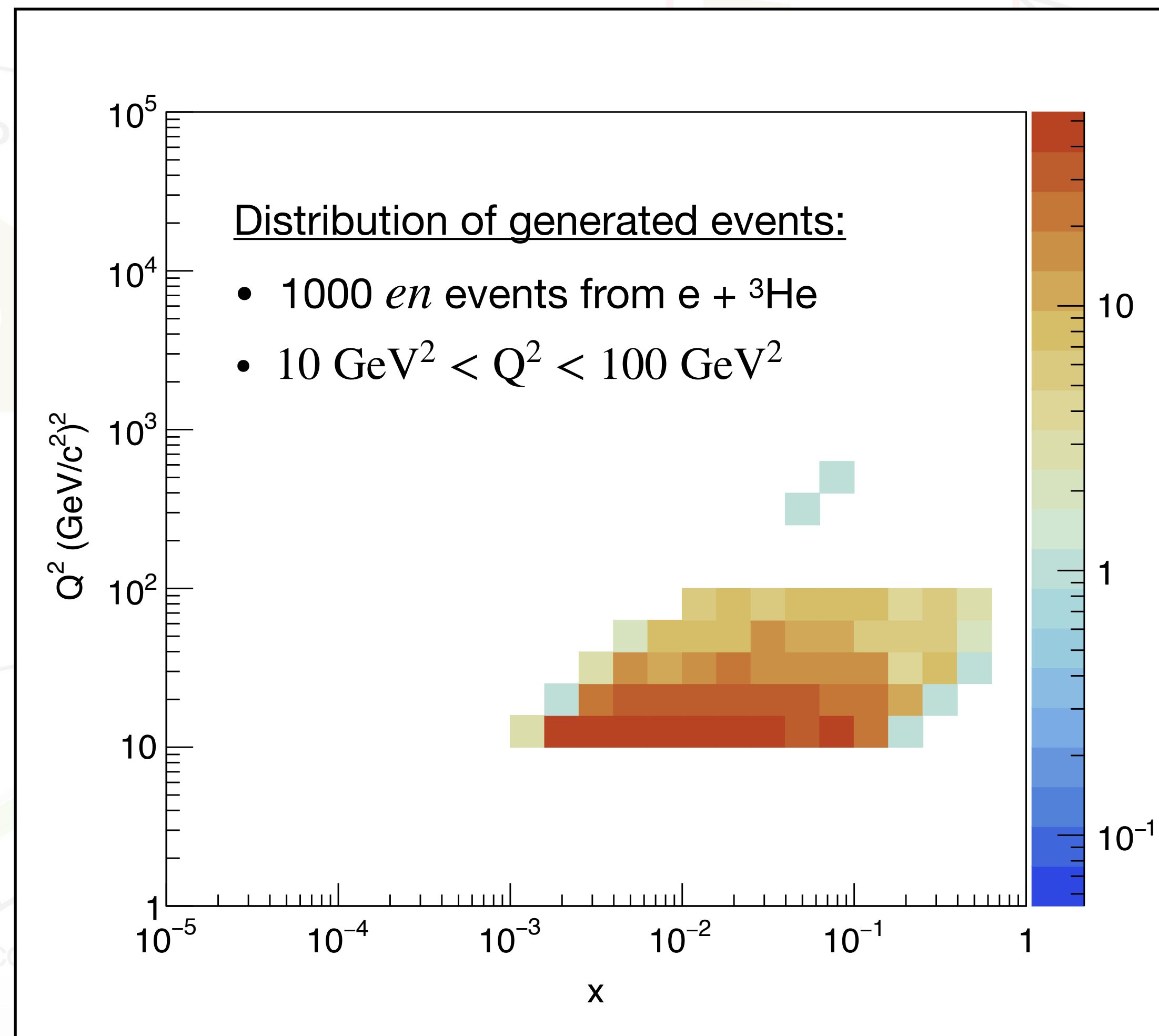
Total of 1M  $e + {}^3\text{He}$  events (33.3% are *en*)

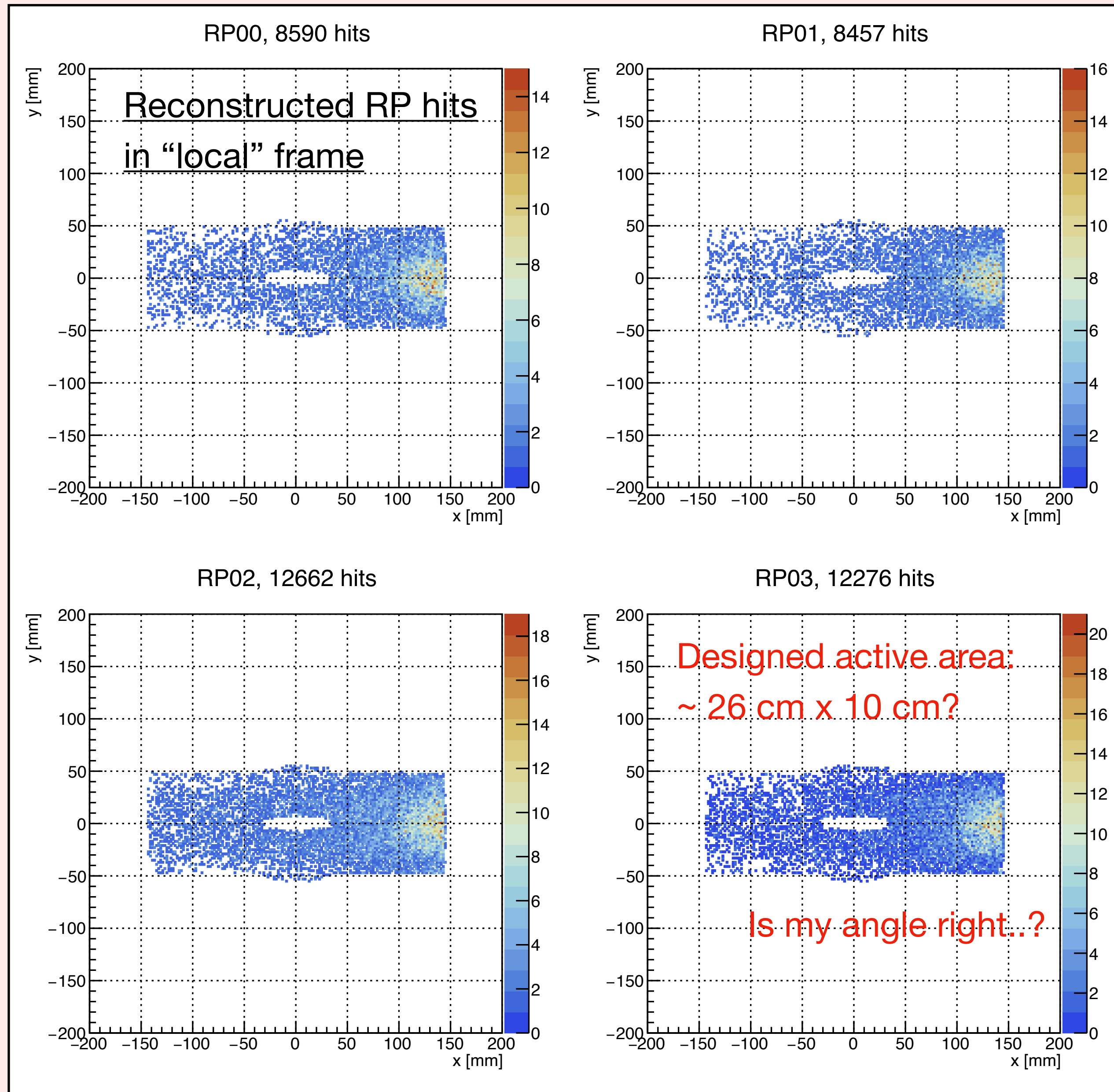
$$0.01 \leq y \leq 0.95$$

# Double spectator tagging



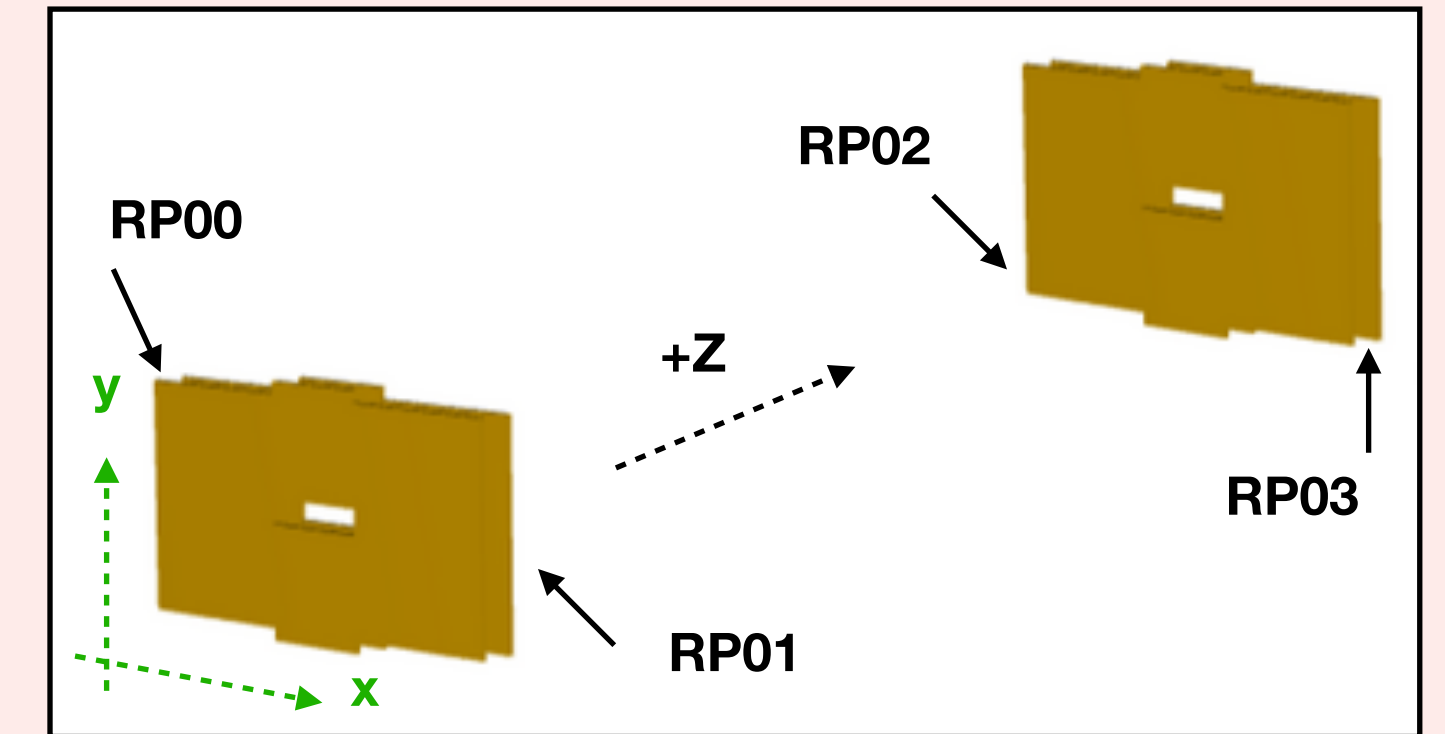
For all data shown today:





## Naming scheme

$\dashrightarrow$  : "local" frame



- Hit positions are taken from eic recon: "ForwardRomanPotRecHits.position.z" etc.
- Apply z cut to separate events on different planes

Assumed geometry:

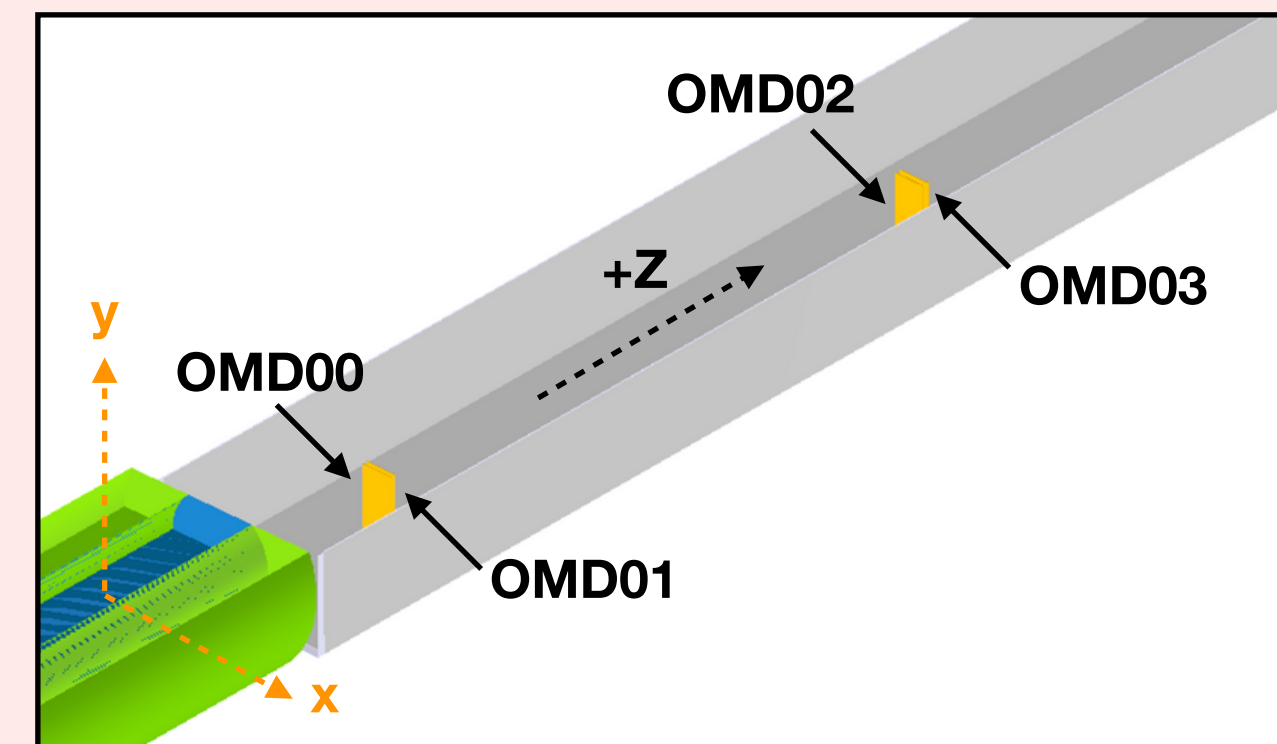
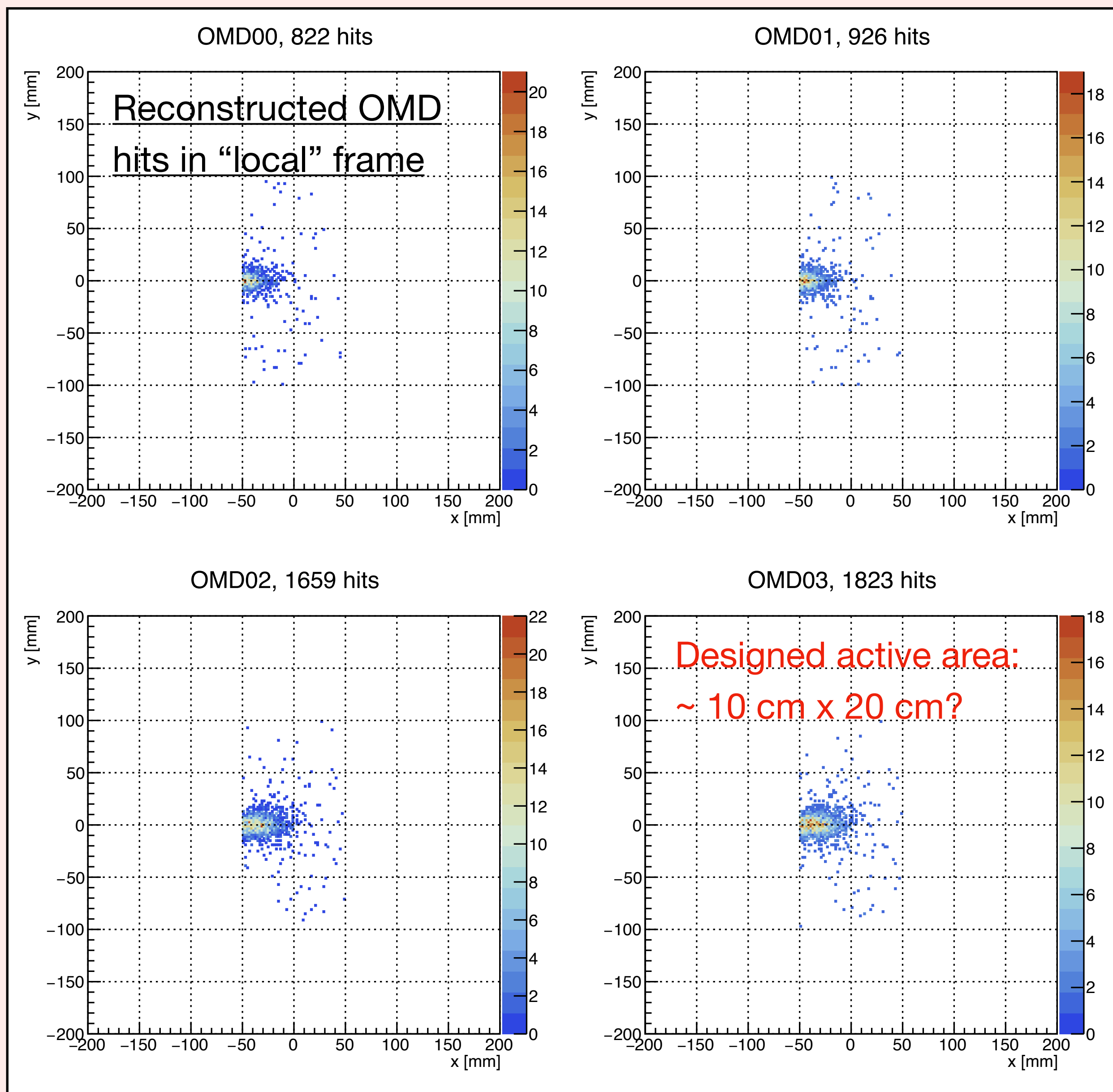
epic/compact/far forward/roman pots eRD24 design.xml

```

<!-- Global "station" location, rotation, position information -->

<constant name="ForwardRomanPotStation1_zpos" value="32547.3*mm" />
<constant name="ForwardRomanPotStation1_xpos" value="-1131.19*mm" />
<constant name="ForwardRomanPotStation2_zpos" value="34245.5*mm" />
<constant name="ForwardRomanPotStation2_xpos" value="-1208.43*mm" />

<constant name="ForwardRomanPotStation1_rotation" value="-0.04545*rad" />
<constant name="ForwardRomanPotStation2_rotation" value="-0.04545*rad" />
    
```



Naming scheme

$\dashrightarrow$  : "local" frame

- Hit positions are taken from eic recon:  
"ForwardOffMTrackerRecHits.position.z" etc.
- Apply z cut to separate events on different planes

Assumed geometry:

[epic/compact/far forward/offM tracker.xml](#)

Station 1 and 2:

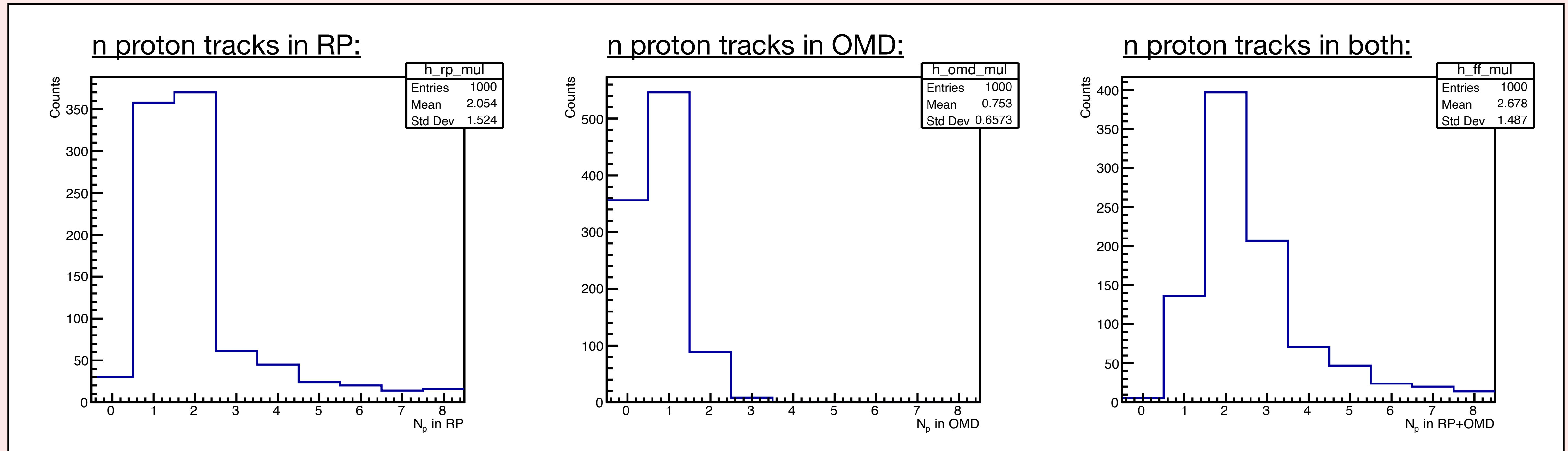
```
<position x="-780.0*mm" y="0" z="22520*mm"/>
<rotation x="0*rad" y="-0.047*rad" z="0*rad"/>
```

Station 3 and 4:

```
<position x="-870.0*mm" y="0" z="24500*mm"/>
<rotation x="0*rad" y="-0.047*rad" z="0*rad"/>
```

# Number of proton tracks per event

- Define proton track: at least one hit per plane per detector (either RP or OMD)



- 97% generated events have at least 1 track in RP

- 64% generated events have at least 1 track in OMD

- 85.90% generated events have at least 2 tracks in RP + OMD