Seed finding inefficiencies for |z| > 50mm

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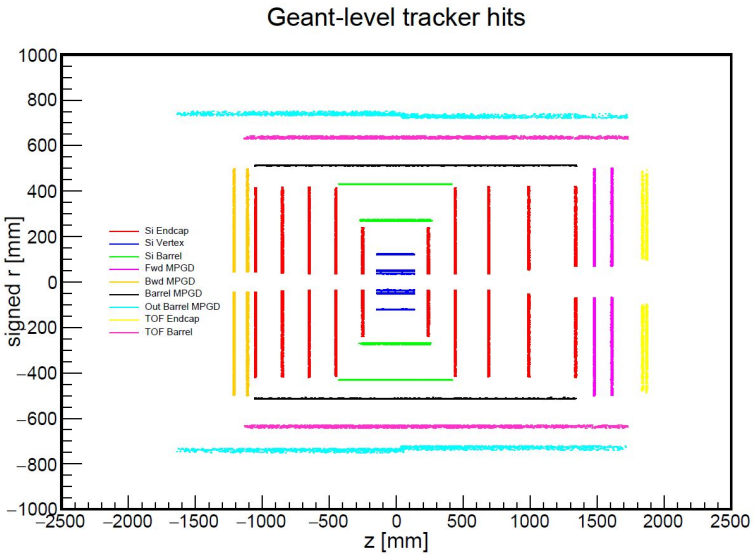
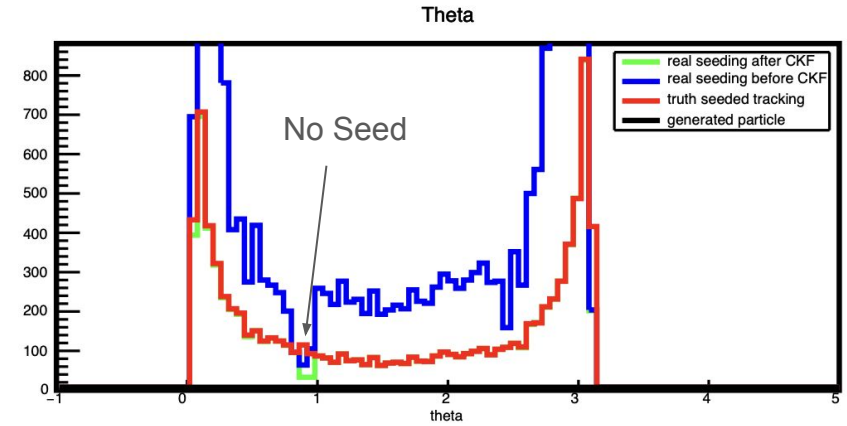
Current issue:

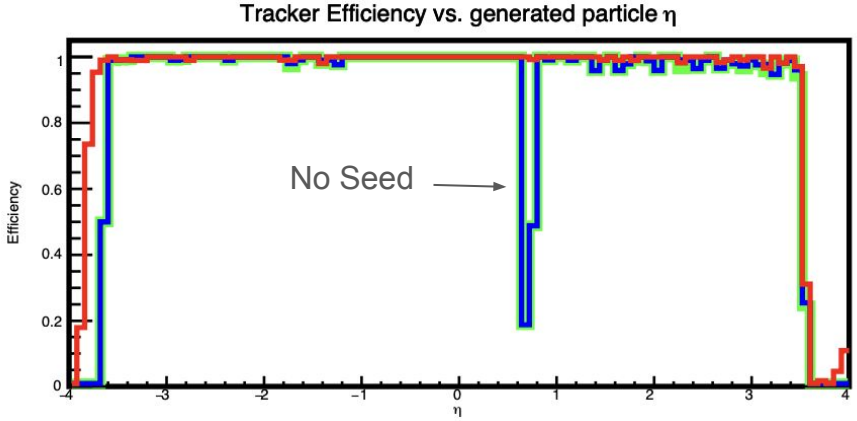
a. For z = 50 and z = 75 mm, we see at least 3 hits for eta ~1 in the SVT volume but don't see a seed. This is caused by the max distance between the middle and the top spacepoint.



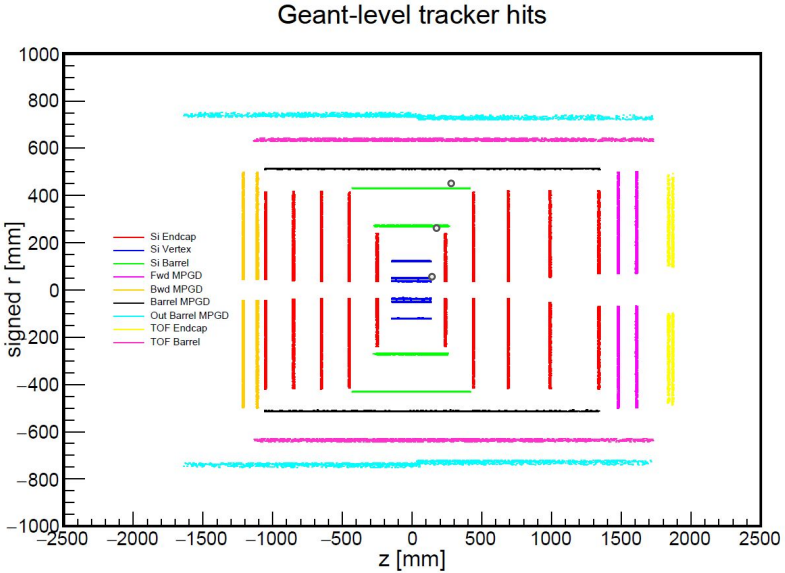

```
/// SEED FINDER GENERAL PARAMETERS
float rMax = 440. * Acts::UnitConstants::mm; // max r
float rMin = 33. * Acts::UnitConstants::mm; // min r t
float zMax = 1700. * Acts::UnitConstants::mm; // max z
float zMin = -1500. * Acts::UnitConstants::mm; // min
float deltaRMinTopSP     = 10. * Acts::UnitConstants::
float deltaRMaxTopSP     = 200. * Acts::UnitConstants:
float deltaRMinBottomSP  = 10. * Acts::UnitConstants::
float deltaRMaxBottomSP  = 200. * Acts::UnitConstants:
```

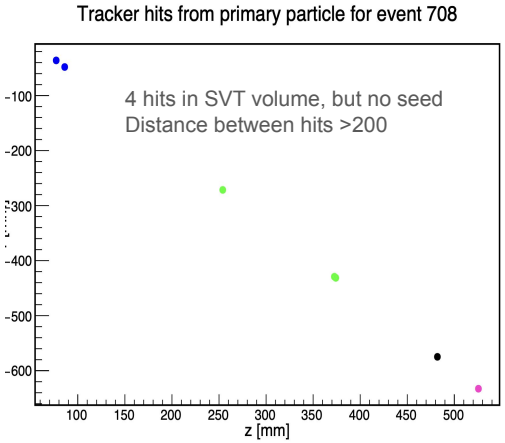


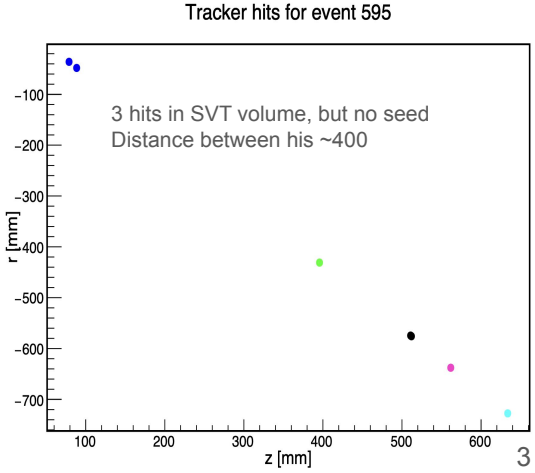
Default setting



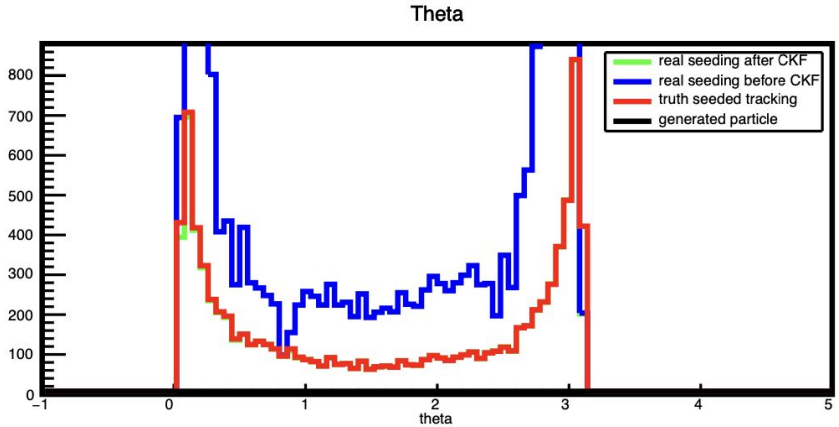
Default setting

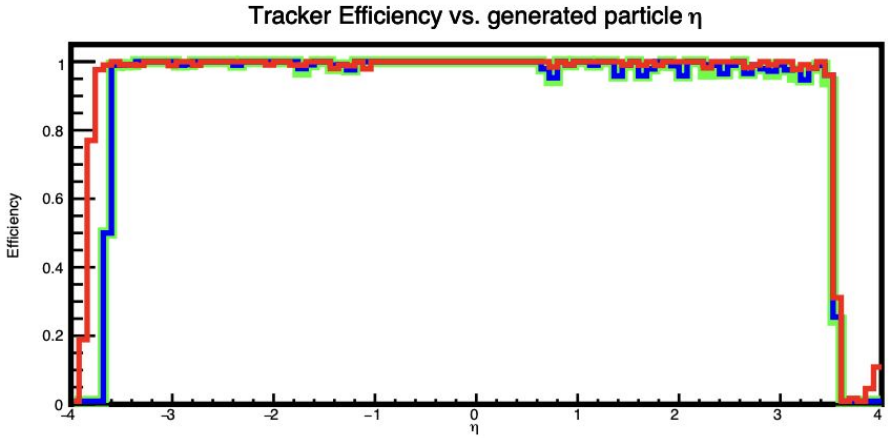


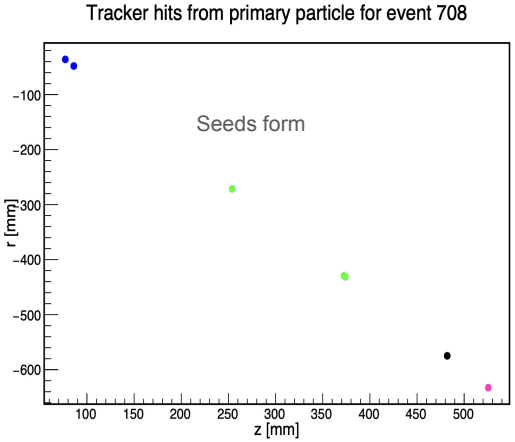


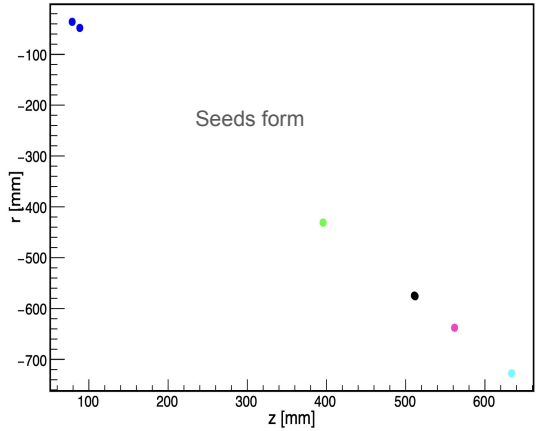


Changing “deltaRMaxTopSP” to 400

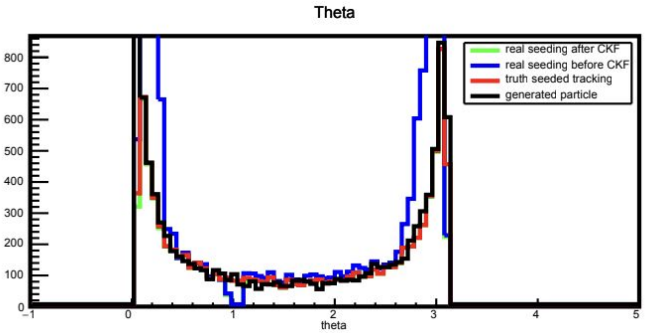




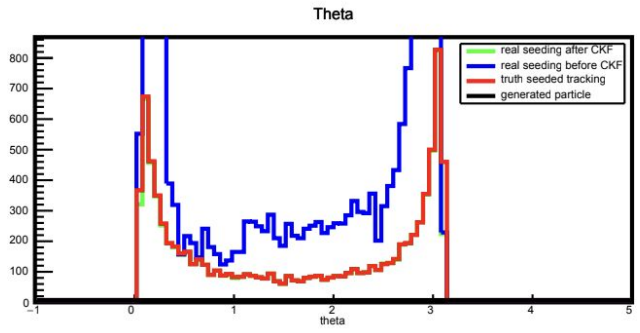




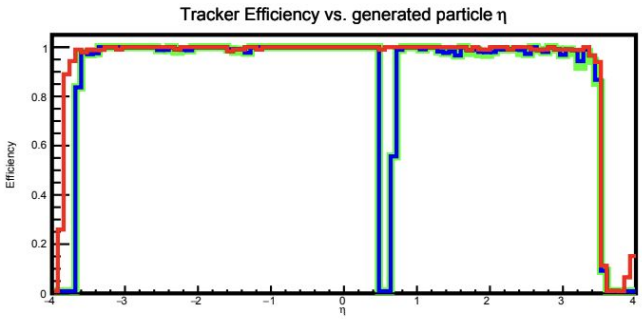
Same results for z=75

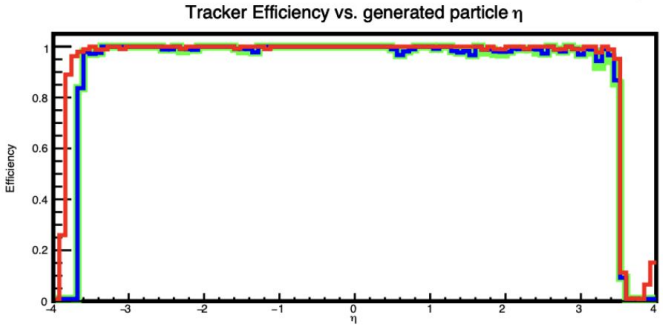


Default setting (deltaRMaxTopSP = 200)



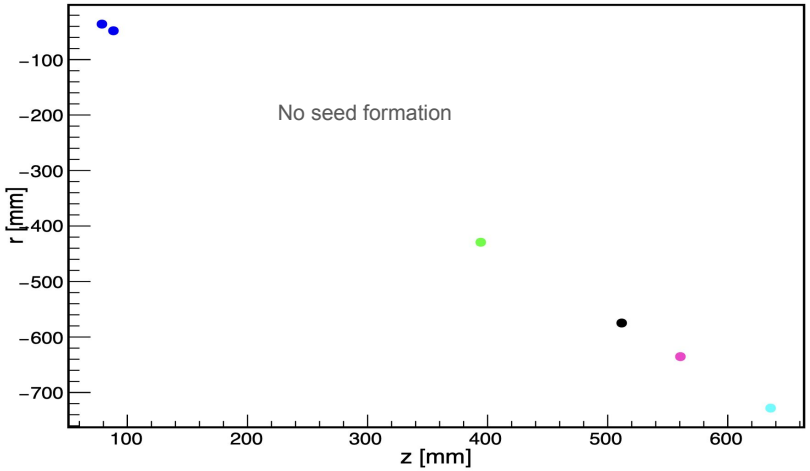
deltaRMaxTopSP = 400

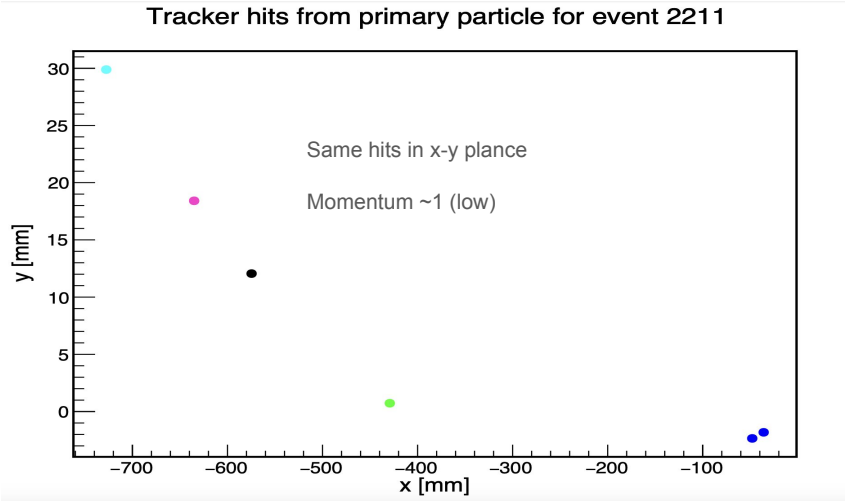




However…

There are a few cases, which satisfy the parameter but do not form a seed





All the events where seeds are not formed have low momentum!

We suspect that sigma scattering is the cause

float sigmaScattering = 5; // How many standard devs of scattering angles to consider

EICrecon/src/algorithms/tracking/OrthogonalTrackSeedingConfig.h

Next:

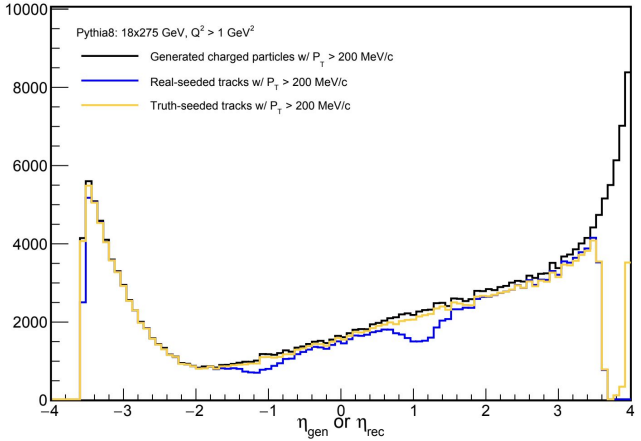
We look for DIS events

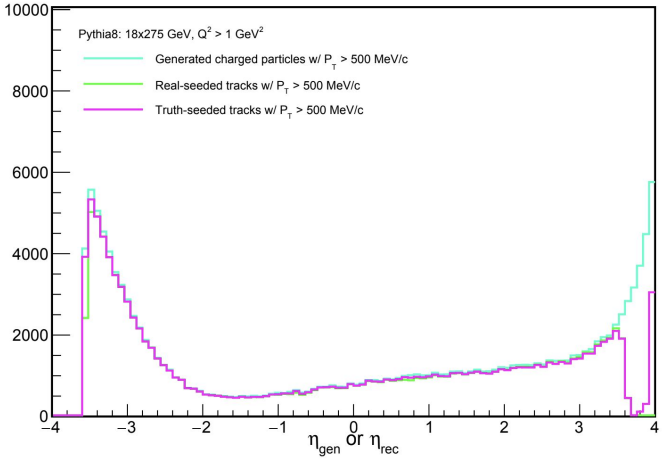
At first, using default parameters

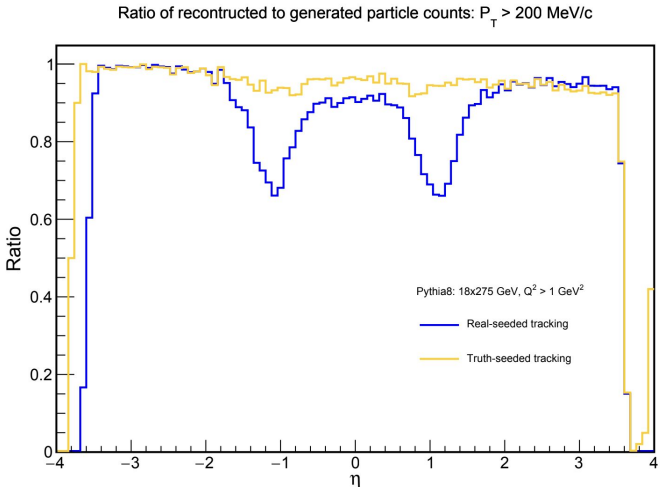
Then changing the “deltaRMaxTopSP” to 400

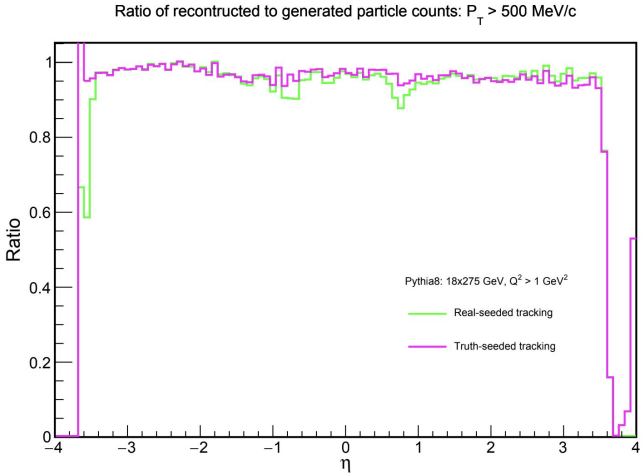
And then look for sigmaScattering

DIS events









We observe loss of seeds at eta ~1 (-1).
We also observe that for higher momentum, seed formation becomes better at those eta values