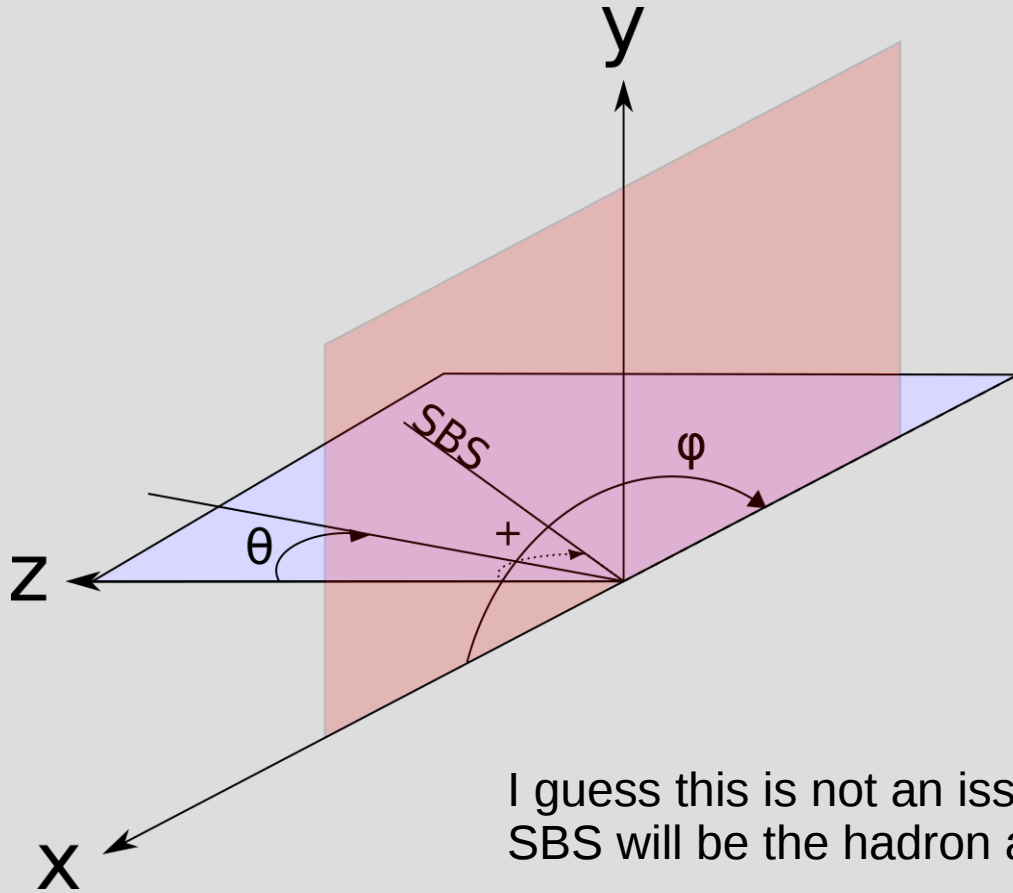


# Info for future coders



SBS rotates in the xz plane positive to the right

In the electron generation, the random variable is theta (polar angle), which for  $\phi = 0$ , implies that its rotation is positive to the left.

Phi random is  $[-12, 12]$  → the electron is generated to the opposite side to SBS.

Solution: generate the same theta but rotated  $180^\circ$  in phi (**thanks Eric**)

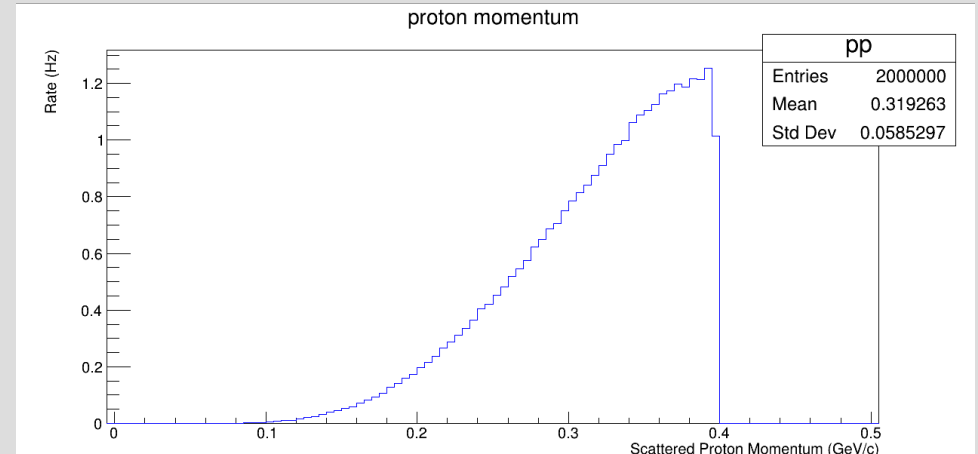
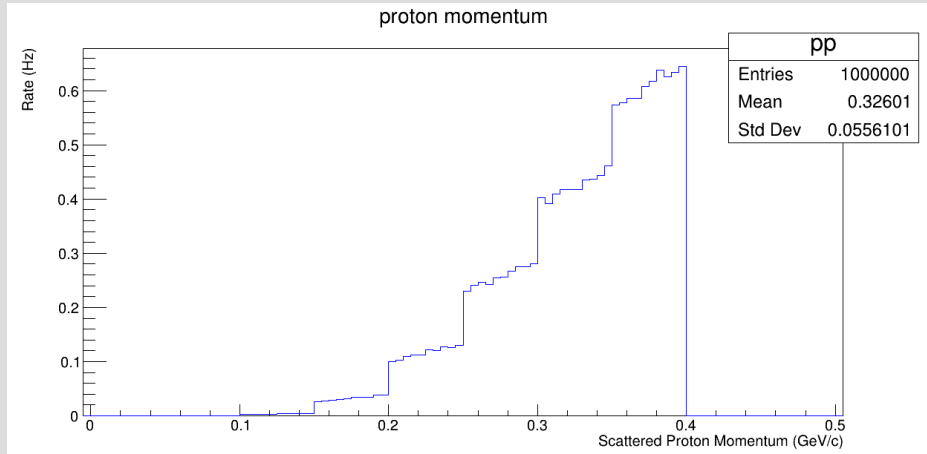
```
PhiMax = (180-12)*deg;  
PhiMin = (180+12)*deg;  
ph = CLHEP::RandFlat::shoot(PhiMin,PhiMax)
```

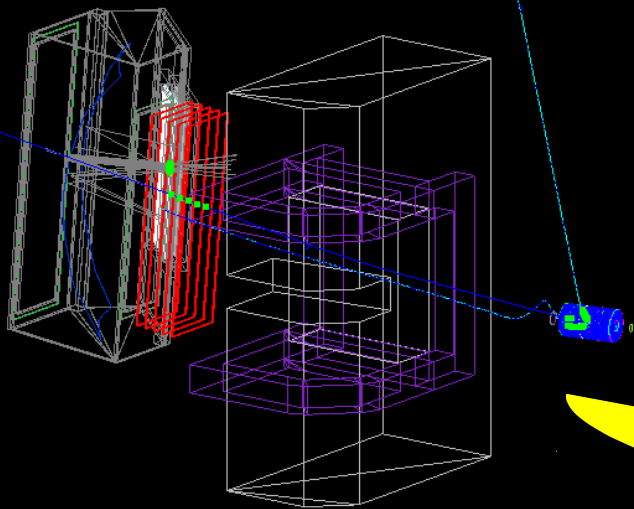
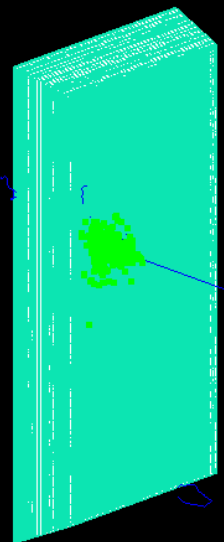
I guess this is not an issue for the other SBS experiments, since SBS will be the hadron arm. In TDIS will be the electron arm

# Status of the code

Proton distribution shows a discrete structure due to the coarse momentum binning of the pion SF parametrization.

A fine binning is now applied, in this case: 100 bins  $\rightarrow$  3MeV step

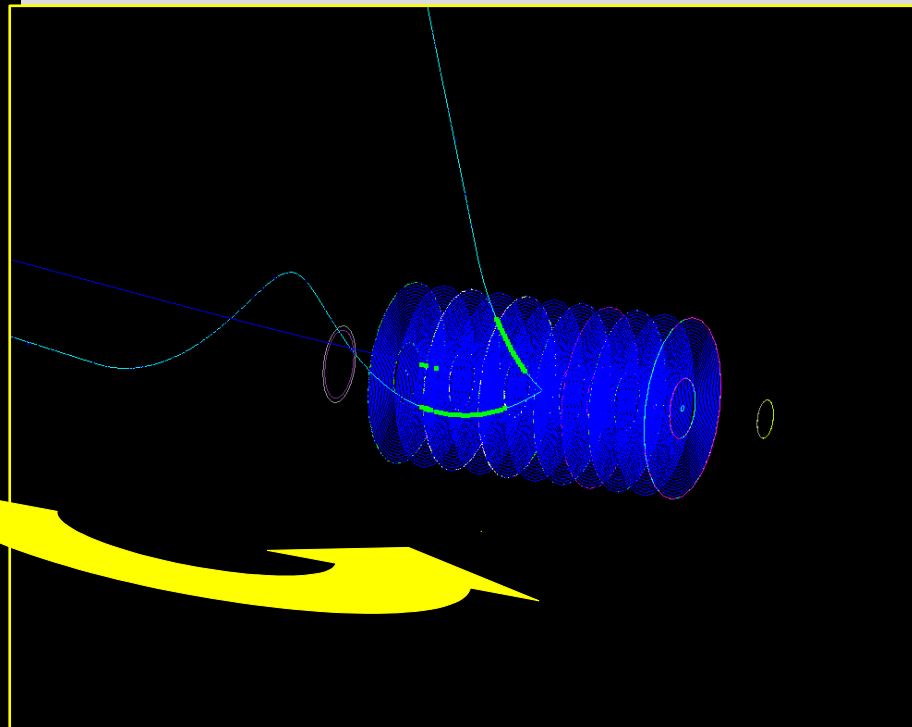




Eric and Rachel's G4 geometry

Started to coded the gun from the generator.

Here is an example of a TDIS event in Deuterium



# Next

- Finish the other gun cases
- Test with Pythia
  - I would like to try Pythia8 but:  
*“At least initially, PYTHIA8 did not include lepton-hadron physics. That was the original reason we didn’t adopt PYTHIA8. If PYTHIA8 now has lepton-hadron physics, then maybe we should revisit. Andrew”*
  - Not clear for me if that happen in the three updates of Pythia, thus, I will move with Pythia6
- Clean the code and fix nomenclature
  - I will upload to my github place, soon-ish.