Two Angle BIBAE DDML integration and ML Trigger

28.09.2023

DDML: Two Angle BIBAE and ML trigger

- Two angle BIBAE now successfully integrated in DDML

- Now, want to implement trigger for when to run fast sim:
  - Training ranges
  - Geometry

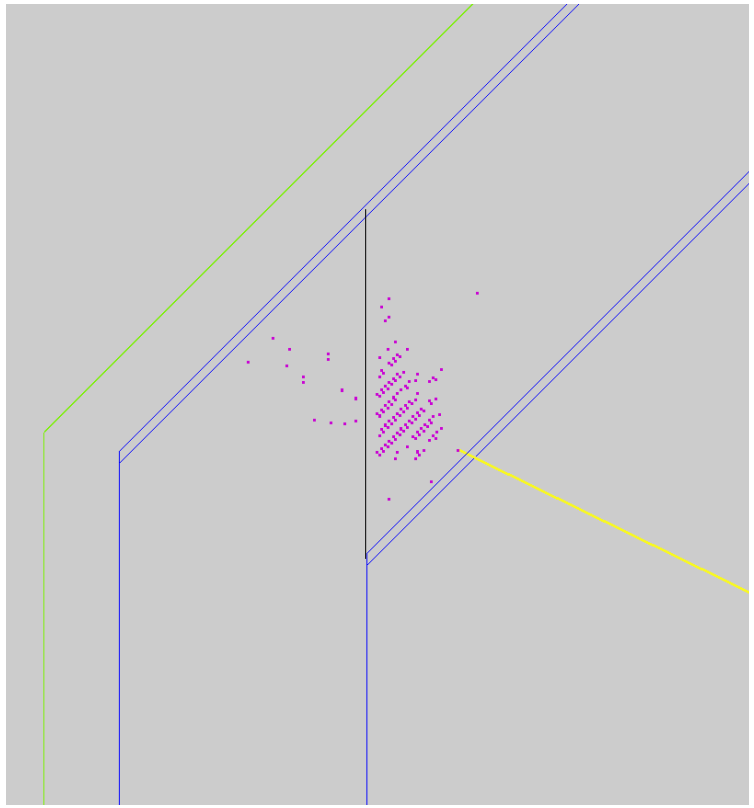
- Extend DDML MLModel template:
  - Geometry
  - Inference
  - Model
  - HitMaker
  - **Trigger**

Sits on top of existing G4/DD4HEP trigger

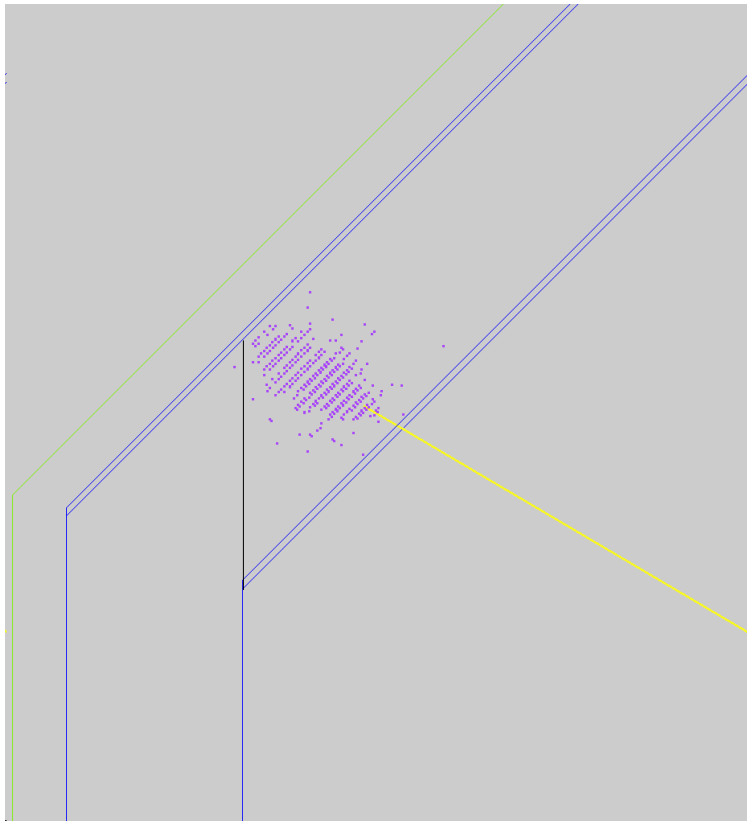
- Have one trigger for each geometry (+any model constraints)

- Check geometry regions to exclude by firing in 126 GeV (top of training range) photons

Barrel Phi Exclusion

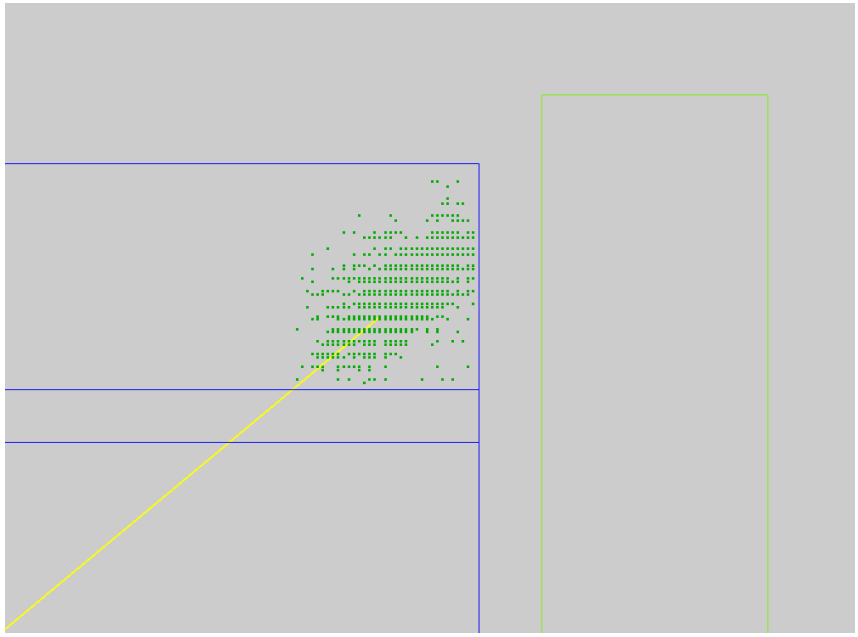


4 degrees from corner

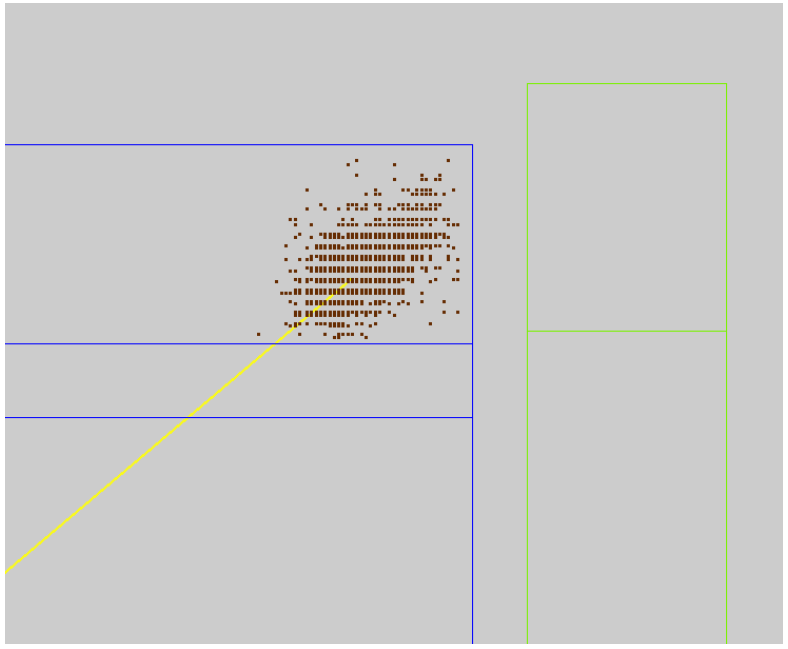


8 degrees from corner

Barrel Theta Exclusion

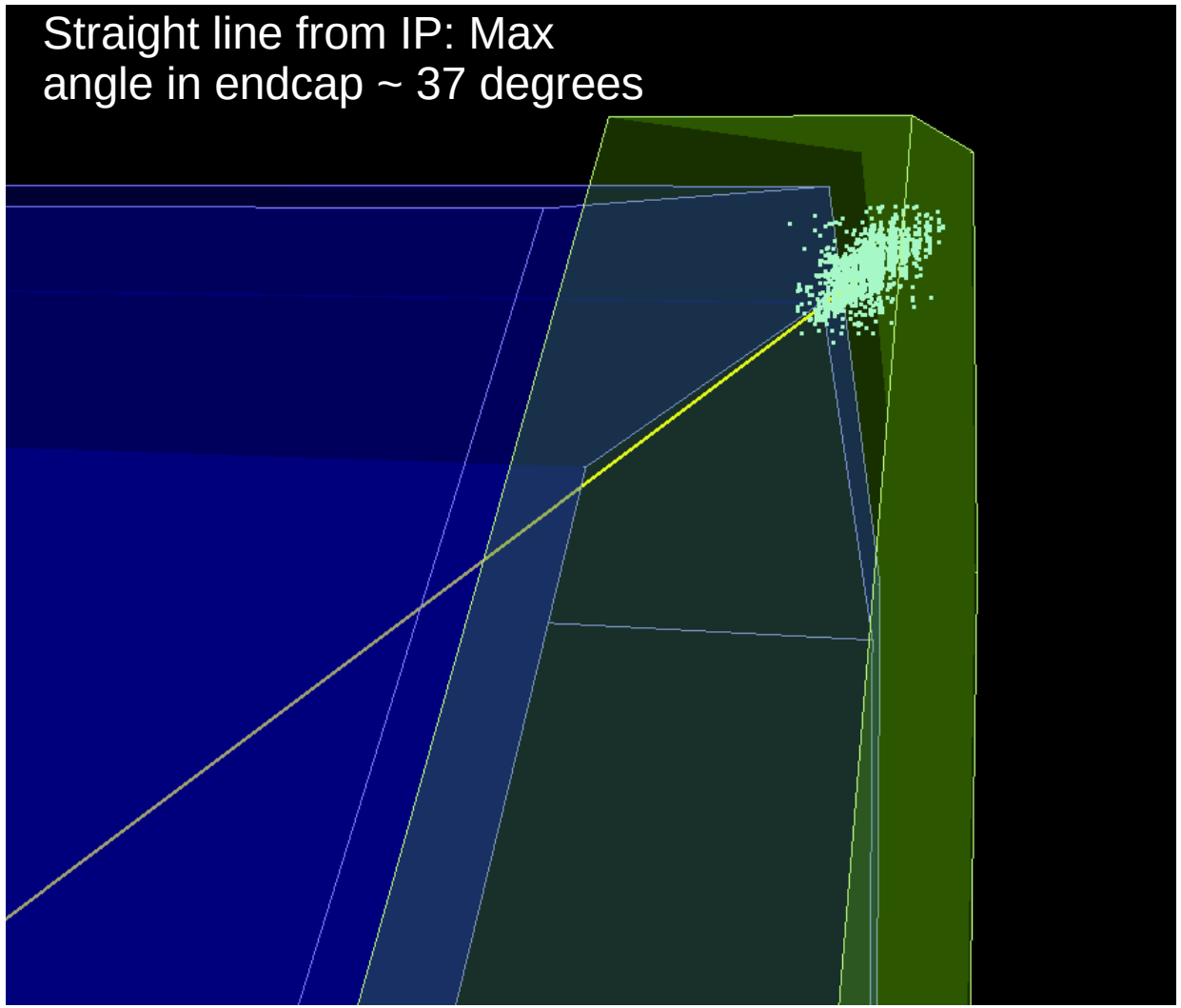


39 degrees in theta



40 degrees in theta

Endcap Theta Exclusion



33 degrees is max reachable angle for the model (65 degree conditioning phis) at 45 degrees in phi…

Therefore lose a 4 degree circle in endcap due to conditioning

All cuts together...

- Barrel:
  - phi
    - pi/8, (pi/8 +pi/4), (pi/8 +2pi/4), (pi/8 +3pi/4), (pi/8 +4pi/4), (pi/8 +5pi/4), (pi/8 +6pi/4), (pi/8 +7pi/4)
    - + 8 degree window in each case → no ML
  - theta
    - 40 deg. <= theta <=140 deg. → use ML
-
- Endcap
  - theta
    - theta <= 33 deg., theta >= 147 deg. → use ML