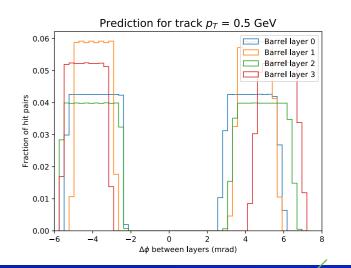- Track information crucial to performant triggers in HL-LHC

- Two algorithms that might help with high rate tracking

- Hough transform

  - Map each hit to all possible circles through that point and the origin, obtain coarse estimate of track parameters and hits from maxima in 2D histogram

  - Less efficient at high impact parameter without large increase in computation required

- Stub finding

  - Designed in to CMS detector

  - Use angular displacement between back-to-back modules to reject low pT hits

  - Early hit rejection, less sensitive to IP

  - O(30%) low-pT hit rejection with 98% eff. for 1 GeV track hits, work in progress to propagate to track efficiency



$\phi_0$

$$R = \frac{qp_T}{B}$$

$A/(qp_T)$

$\phi_0$

$\Delta\phi$

Low pT, Large inclination

High pT, Small inclination

O(mm)

Prediction for track $p_T$ = 1.0 GeV

Prediction for track $p_T$ = 0.5 GeV

Barrel layer 0
Barrel layer 1
Barrel layer 2
Barrel layer 3

Fraction of hit pairs

$\Delta\phi$ between layers (mrad)