

Weekly Report

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Sep.2 2020

CEPC software

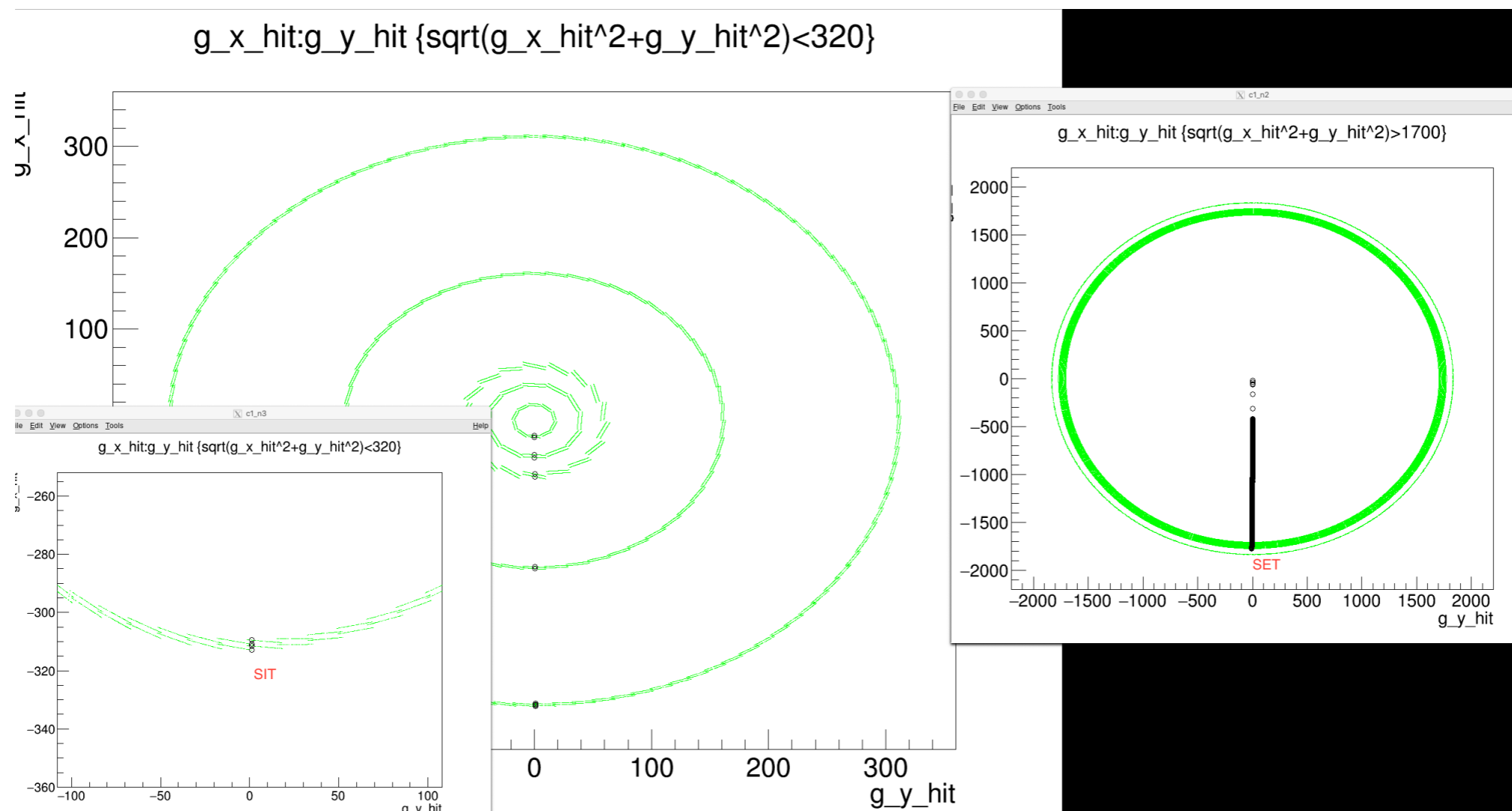
Known problems: Asymmetry along phi direction

Reason : 1.Overlap and mis-hit due to silicon tracker layout

Solved by tuning the geometry

2. Bugs at $\pm\pi/\pi$: may have strange value when propagation/smearing

Need some code to protect



A example that doesn't hit SET by hit SIT twice

Impact parameter resolution

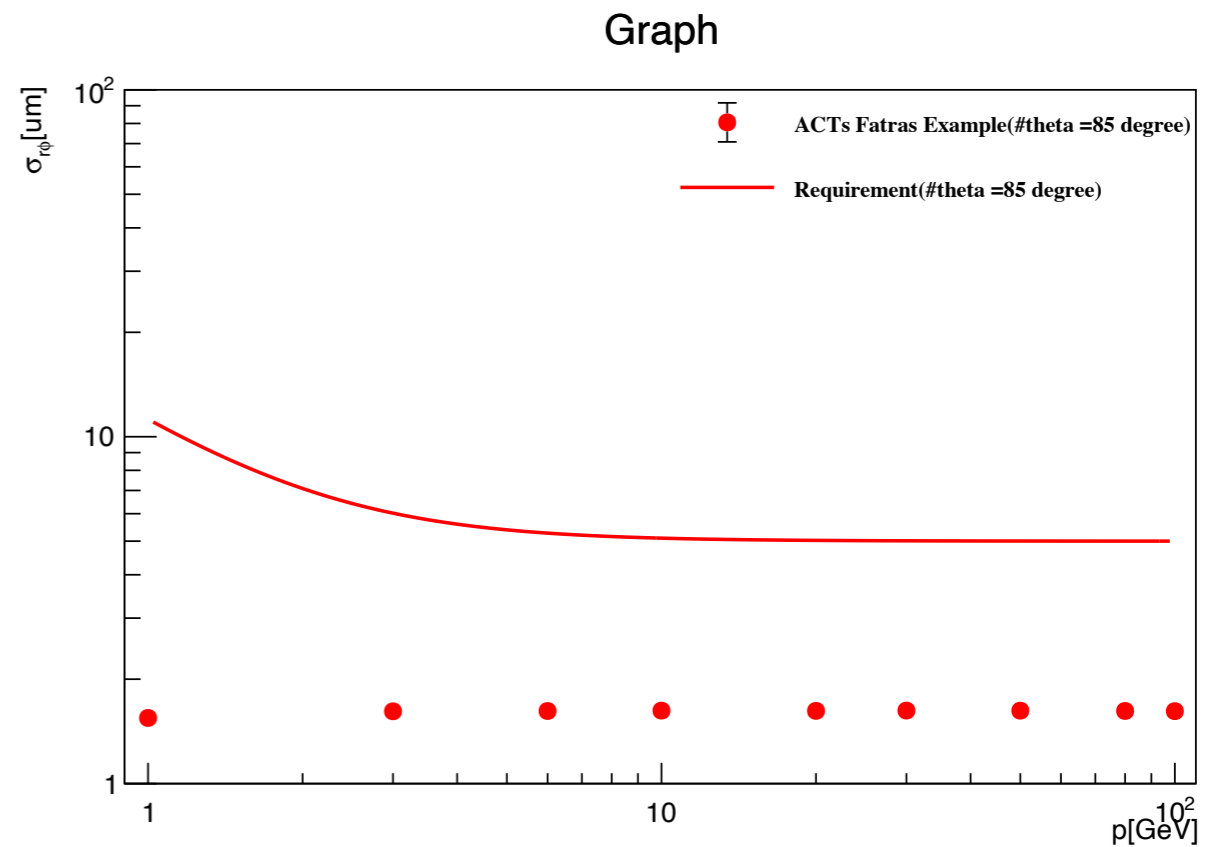
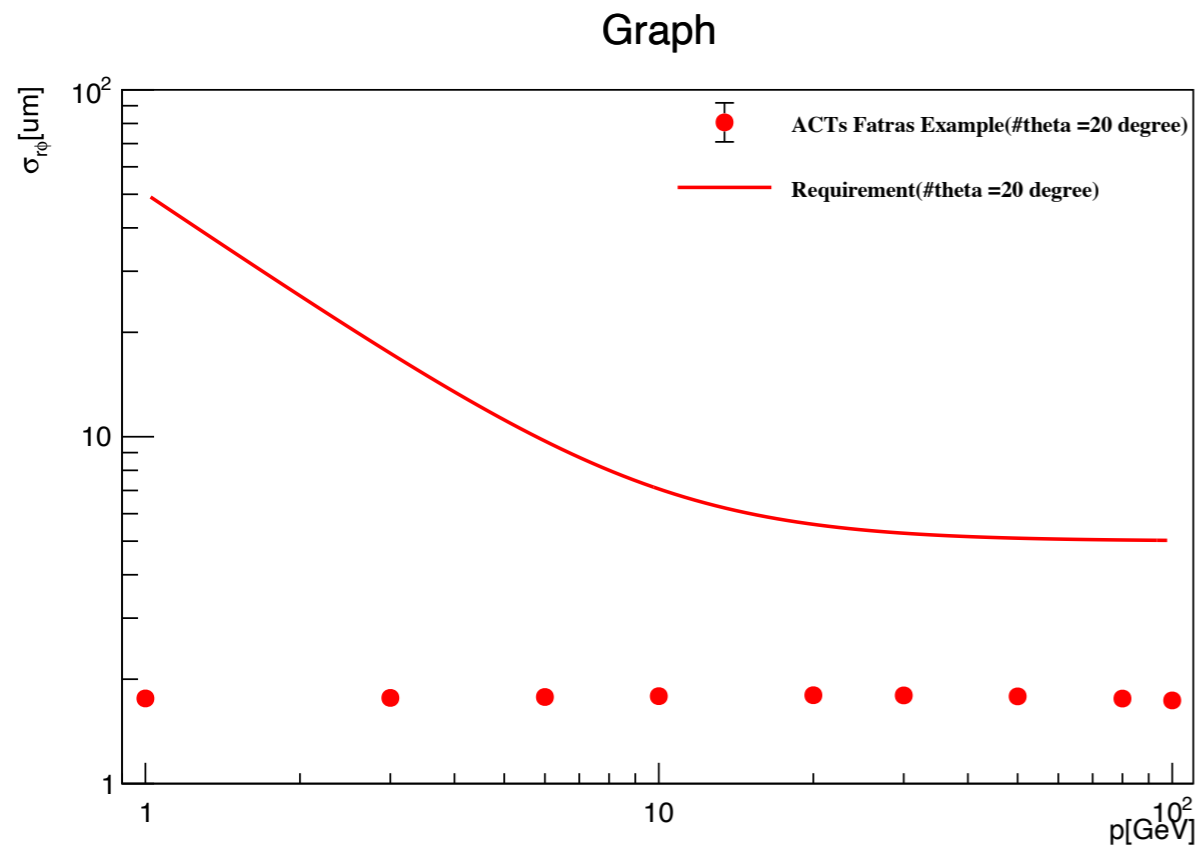
- Requirement

$$\sigma_{r\phi} = a \oplus \frac{b}{p(\text{GeV}) \sin^{\frac{3}{2}} \theta}$$

- First term : intrinsic resolution of the vertex detector
- Second term : effects of multiple scattering

Impact parameter resolution

- Fixed gap , no material

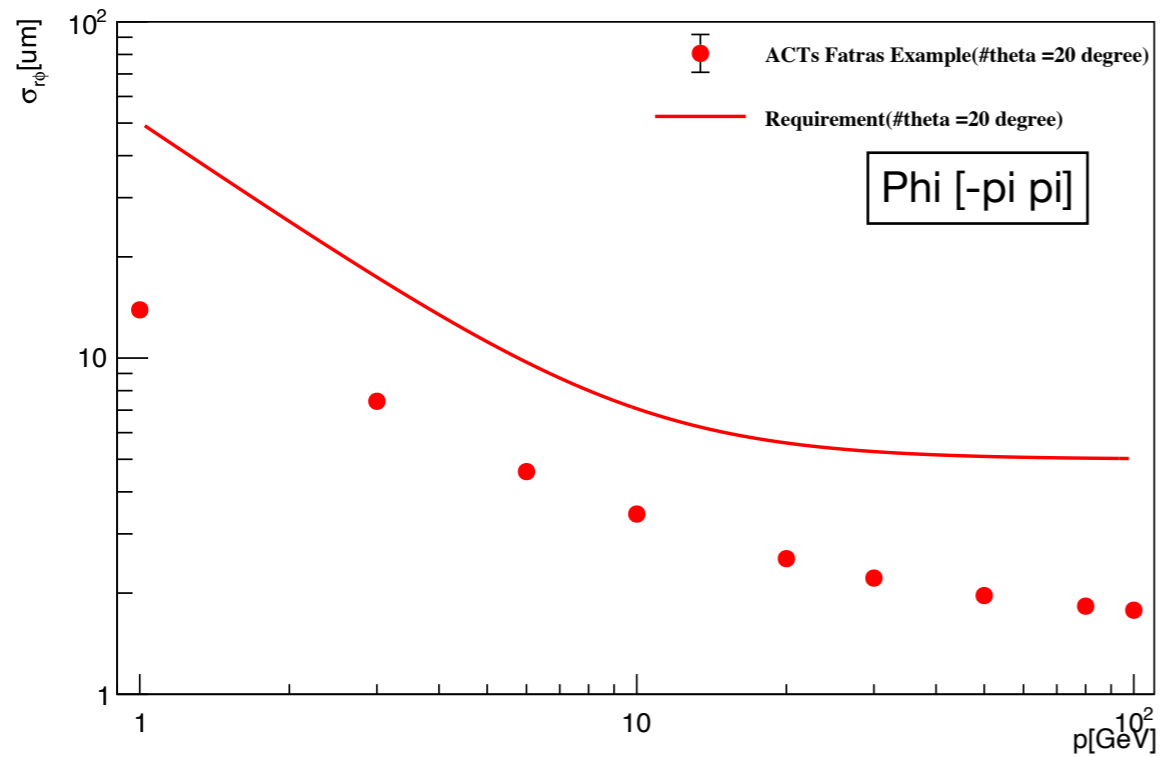


- Scan d_0 resolution vs absolute momentum p
- Flat number because no material effects at all

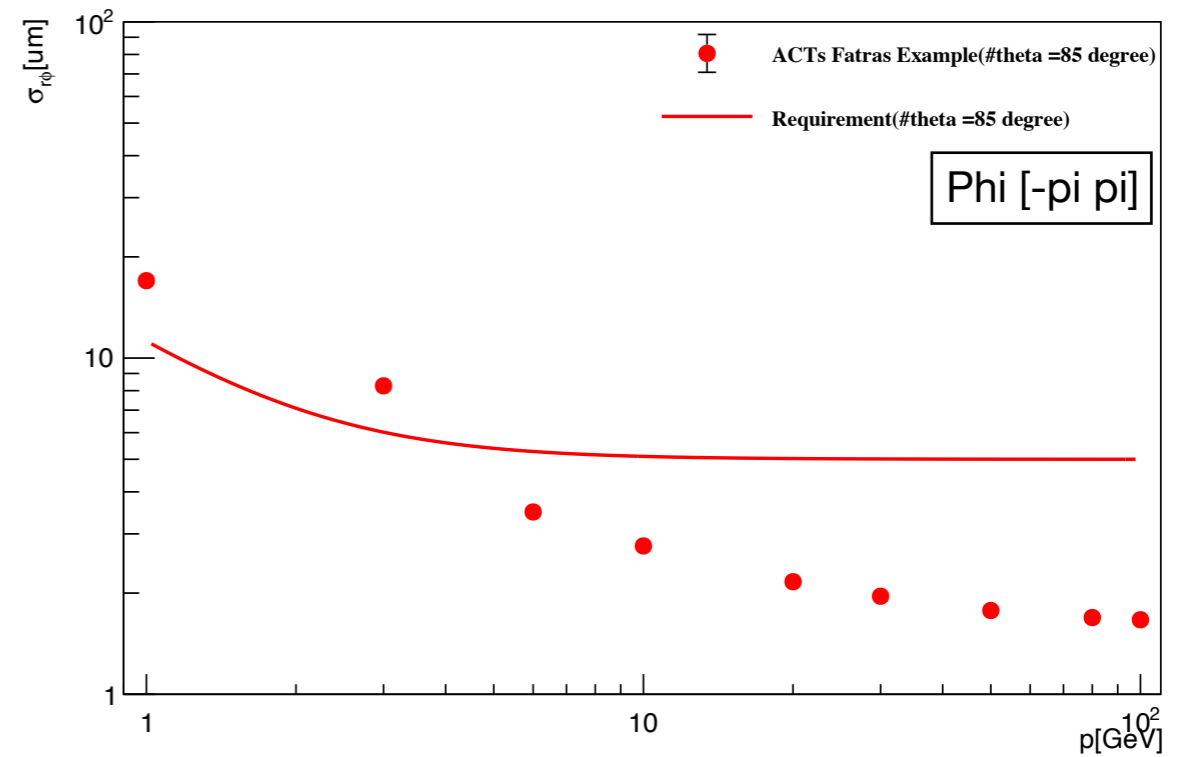
Impact parameter resolution

- Fixed gap, with material

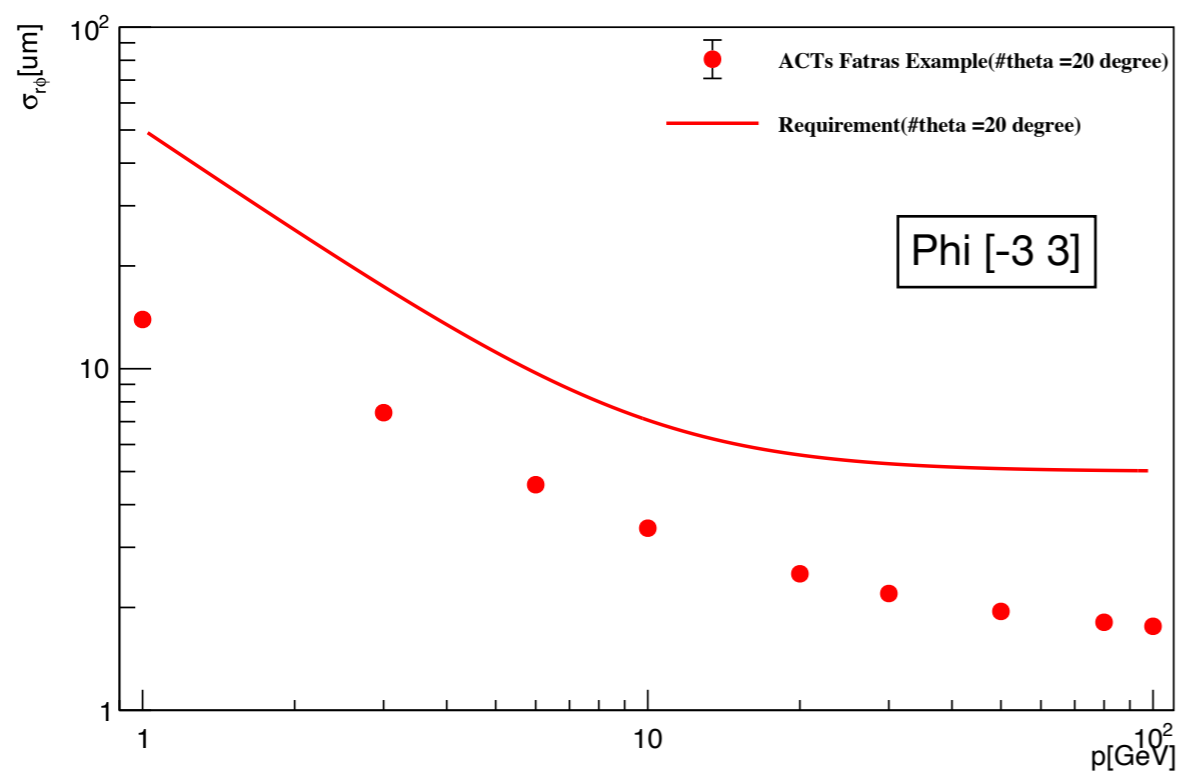
Graph



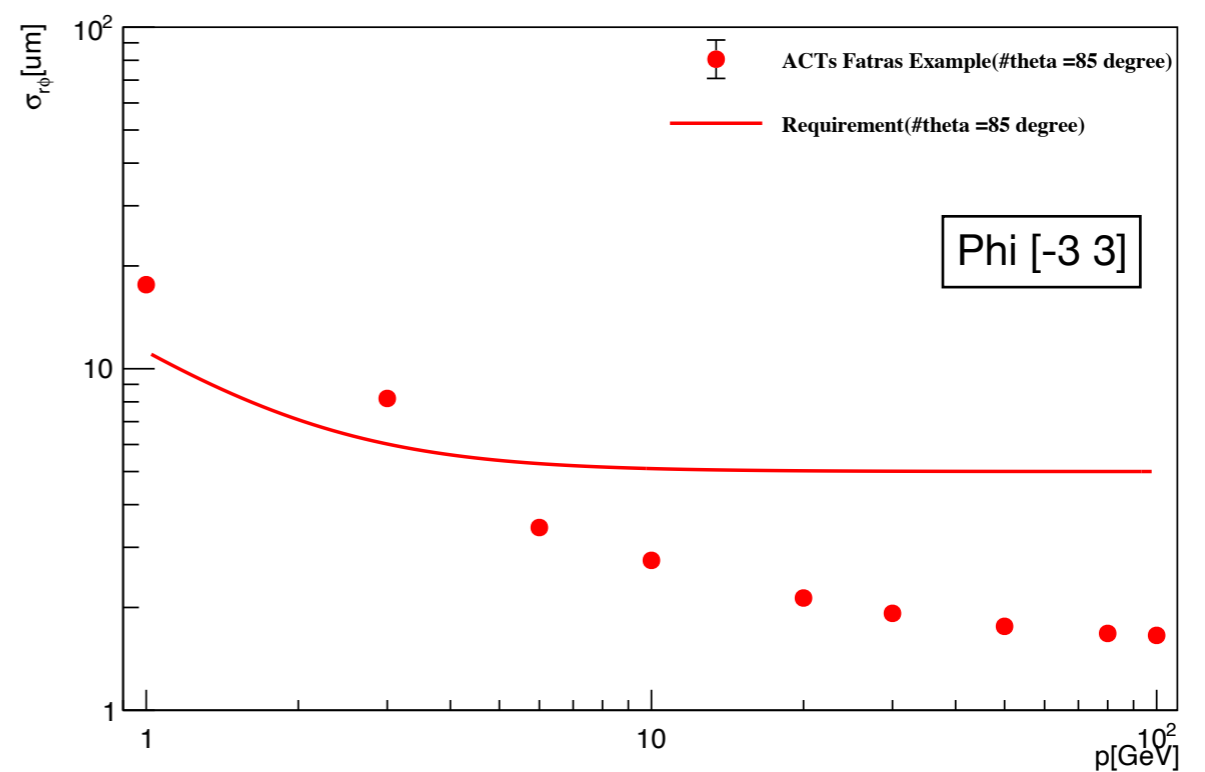
Graph



Graph



Graph



Momentum resolution

- **Different equation**

$$\sigma_{1/p_T} = a \oplus \frac{b}{p \sin^{3/2} \theta} \quad [\text{GeV}^{-1}]$$

CEPC CDR

One more (sin)^{1/2} term ?

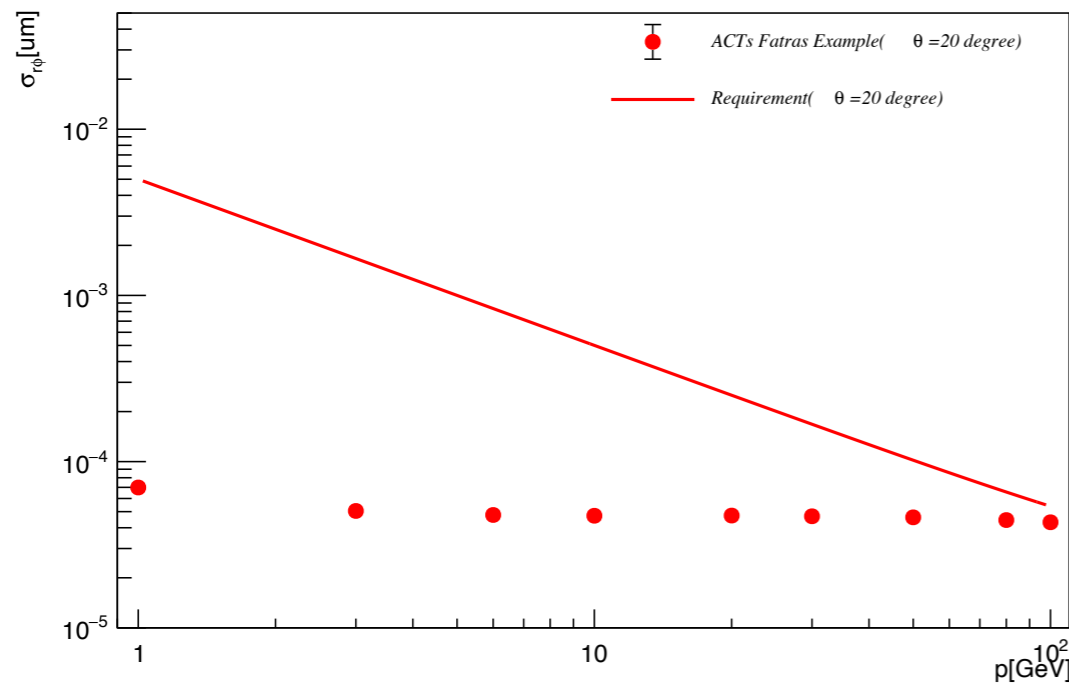
$$P = Pt \cdot \sin(\theta)$$

$$\Delta \left(\frac{1}{p} \right) [\text{GeV}]^{-1} = 2 \times 10^{-5} \oplus \frac{10^{-3}}{p [\text{GeV}]}$$

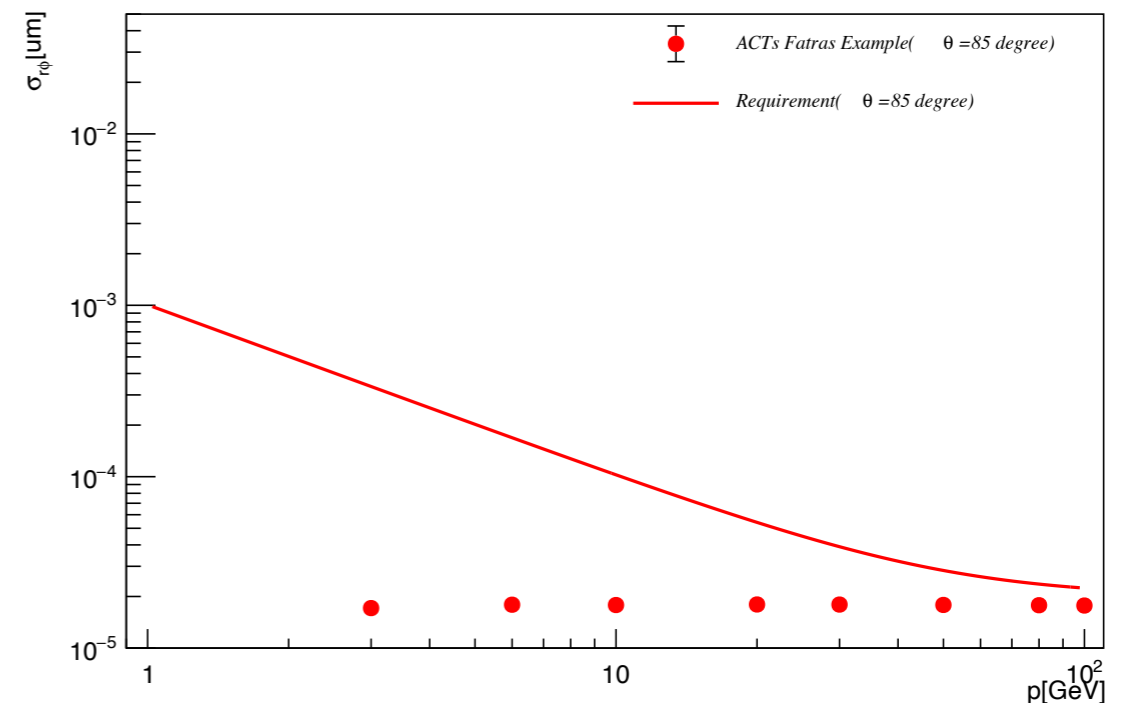
ILC: arXiv:1303.3187v2

- **Fixed gap, no material**

Graph



Graph



- Some bad point pull the RMS of q/p to one slide

Momentum resolution

- Fixed gap, with material

