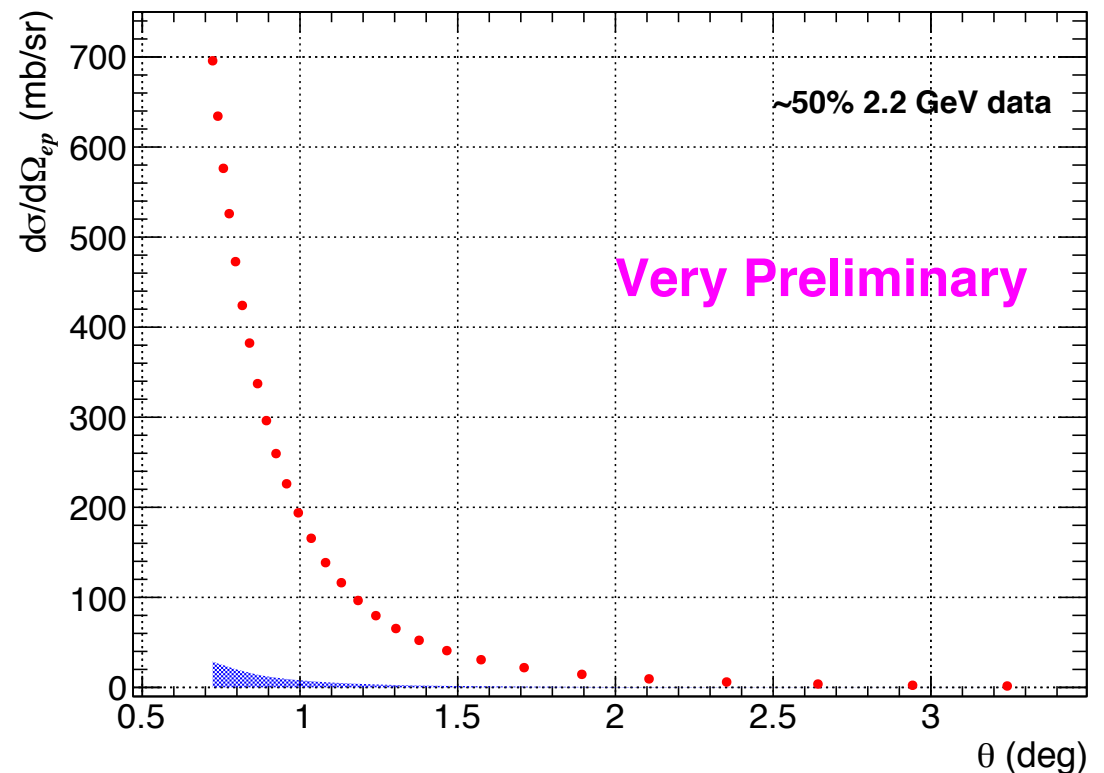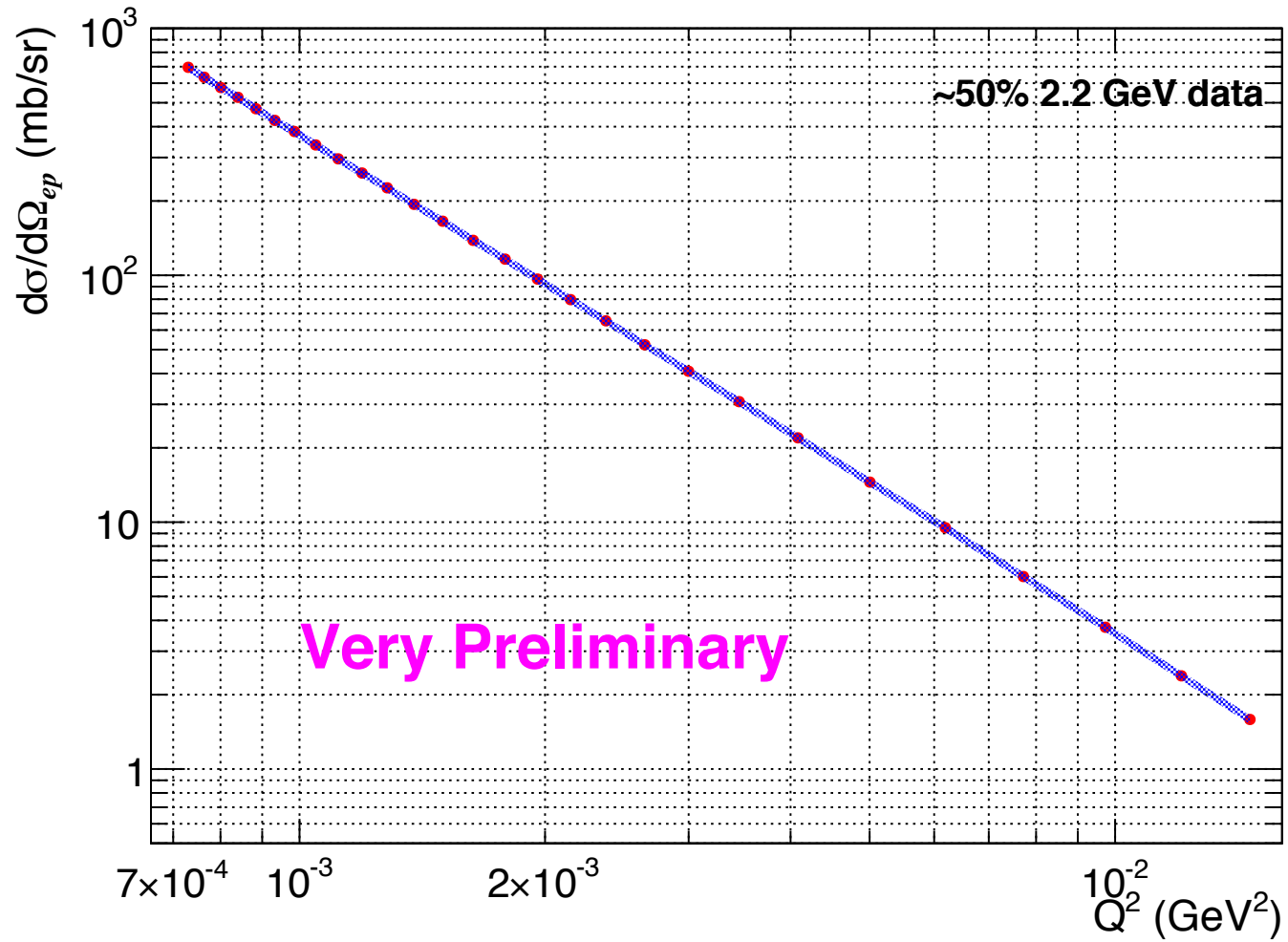- For theta < 2.0 deg, using hybrid Moller selection method: use HyCal to select double arm Moller, don't require two GEM hits at the same time
  - Energy independent part of GEM efficiency canceled

- For theta > 2.0 deg, using integrated Moller method
  - Still using hybrid Moller method to select doubel arm Moller
  - For Moller yield in each angle bin, correct the GEM efficiency
  - Sum all Moller yield from 0.785 to 2 deg, and use it as normalization to the ep yield
  - For ep in each angle bin, correct for the GEM efficiency
  - Form the ep/ integrated Moller ratio

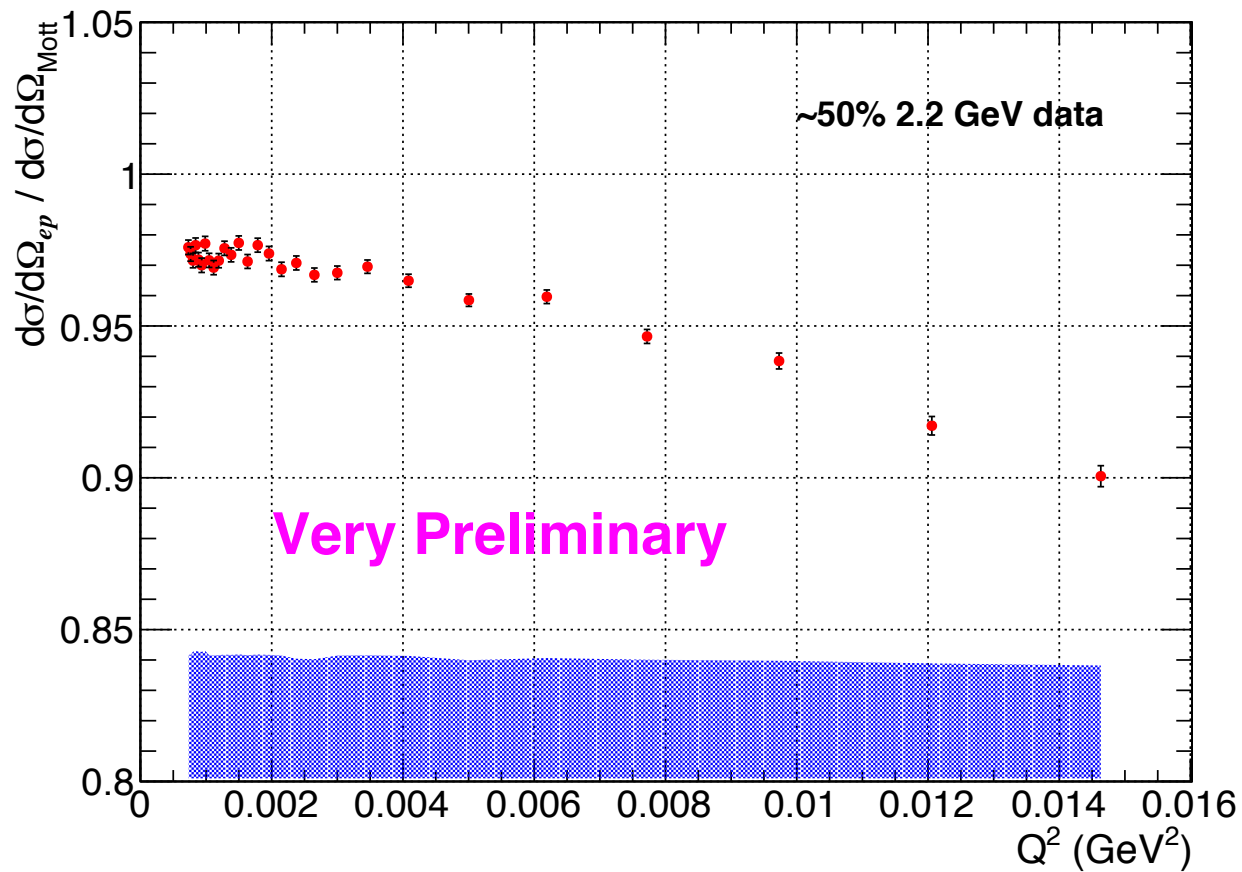*ep* elastic scattering cross section

~50% 2.2 GeV data

Very Preliminary

$d\sigma/d\Omega_{ep}$ (mb/sr)

θ (deg)

ep elastic scattering cross section

$d\sigma/d\Omega_{ep}$ (mb/sr)
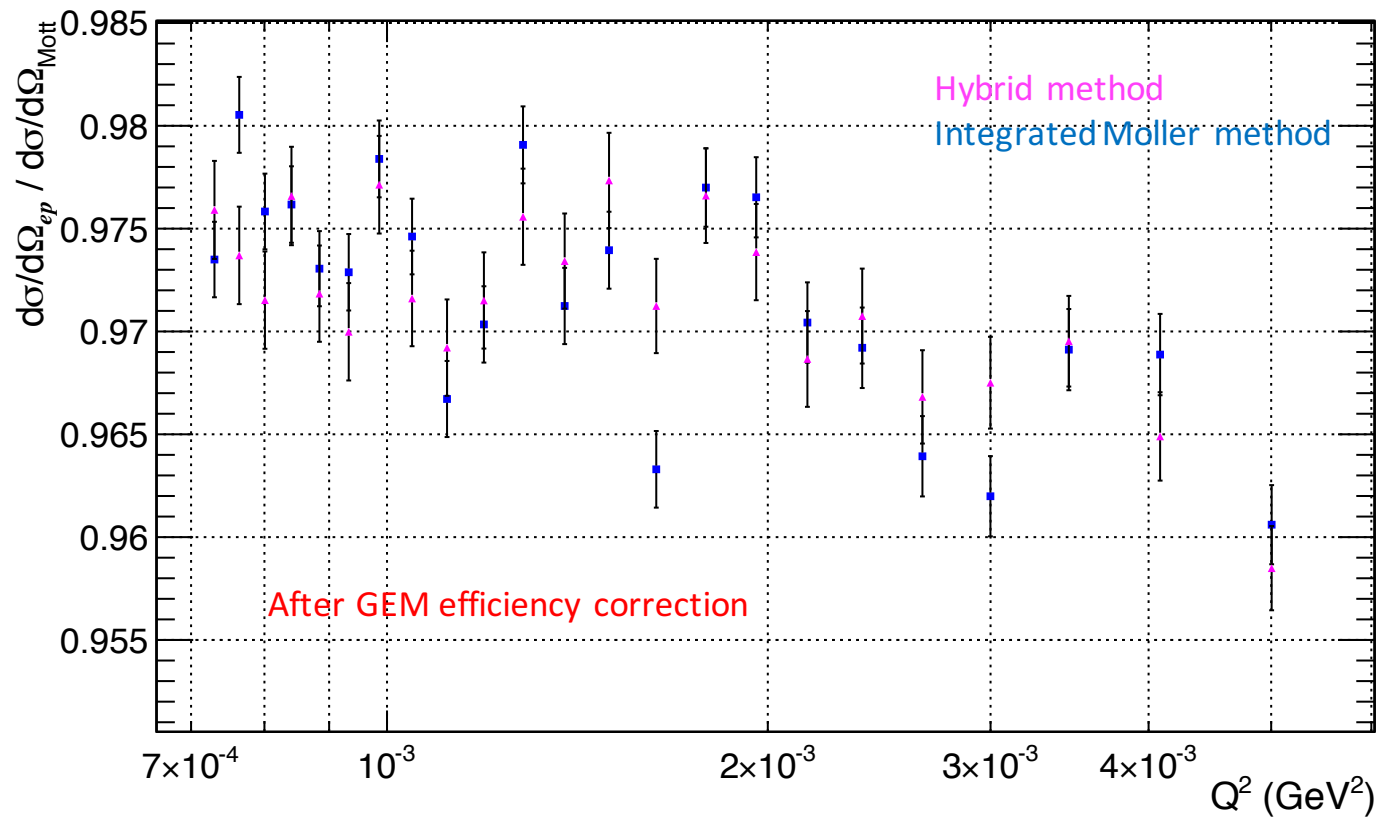
Q^2 (GeV^2)

~50% 2.2 GeV data

Very Preliminary

$$\frac{\frac{d\sigma}{d\Omega}_{ep}}{\frac{d\sigma}{d\Omega}_{Mott}} = \frac{E'}{E}\frac{1}{1+\tau}\left(G_E^2 + \frac{\tau}{\epsilon}G_M^2\right)$$
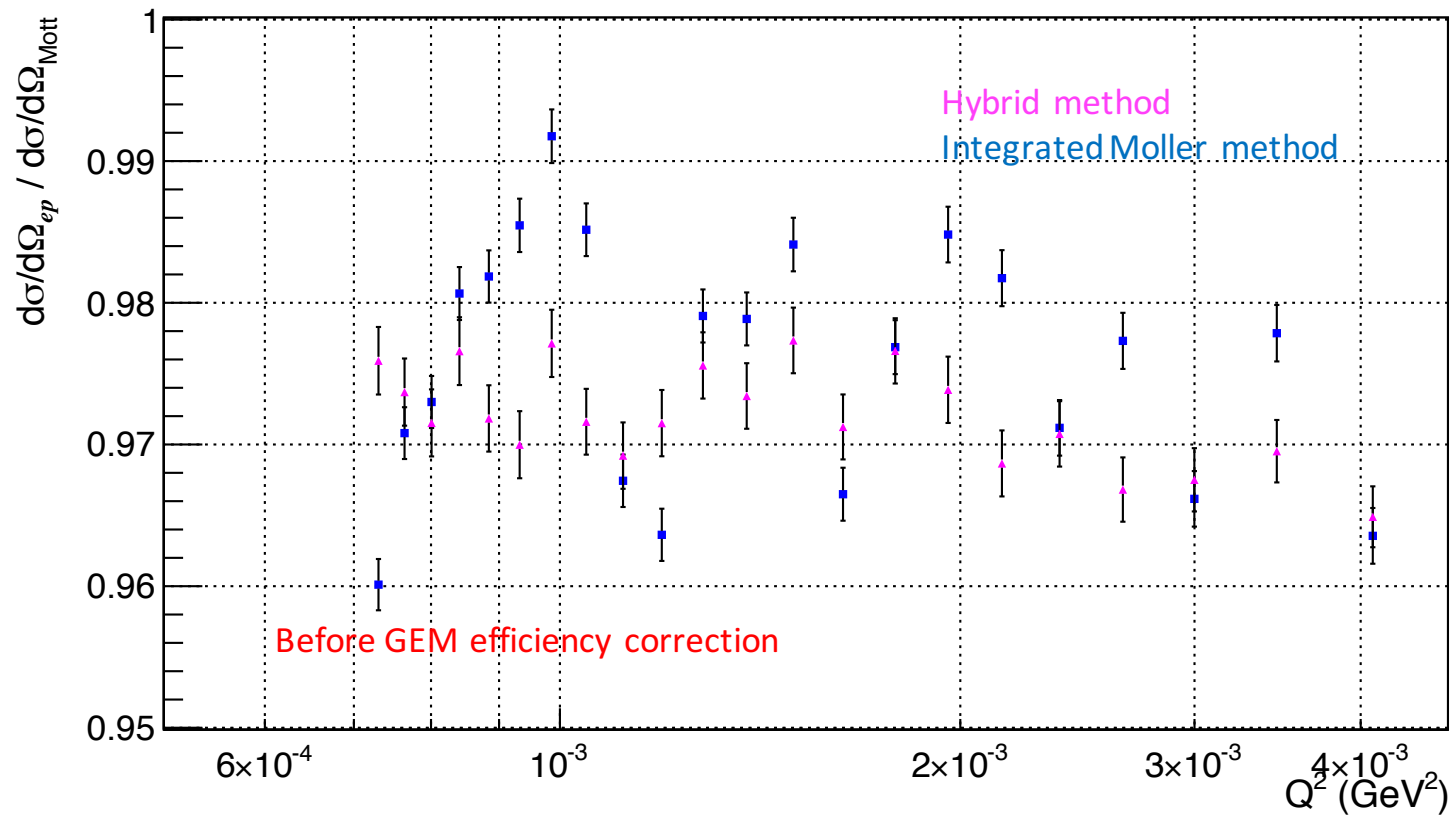
Normalized *ep* elastic scattering cross section

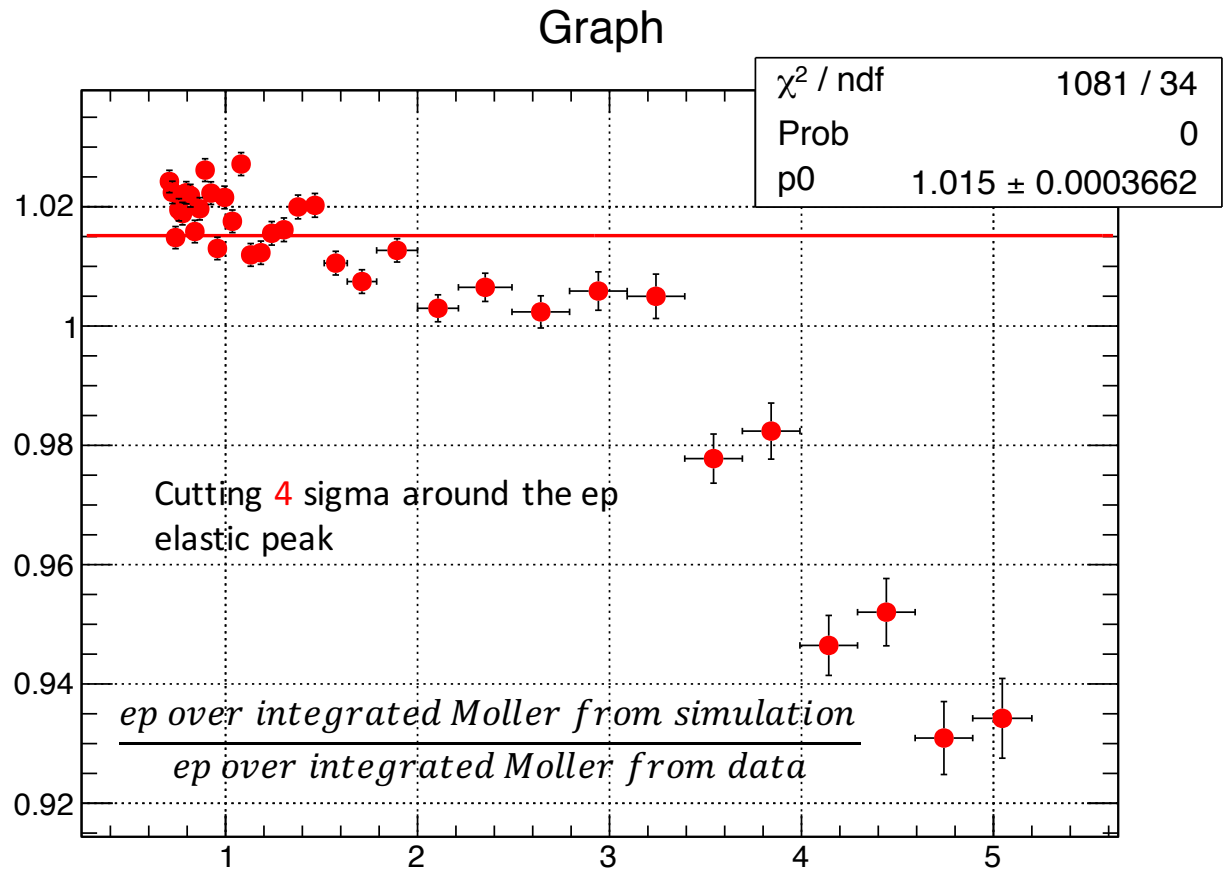Using data point with theta < 2 deg to check the systematic of GEM efficiency.

Using data point with theta < 2 deg to check the systematic of GEM efficiency.

- Currently having some problem with data in transition and LG region

- Simulation and data match very bad in these two region

- The discrepancy seems to depend on size of cut around the elastic peak
  - The smaller the cut, the better the agreement

Graph

χ^2 / ndf	1081 / 34
Prob	0
p0	1.015 ± 0.0003662

Cutting 4 sigma around the ep elastic peak

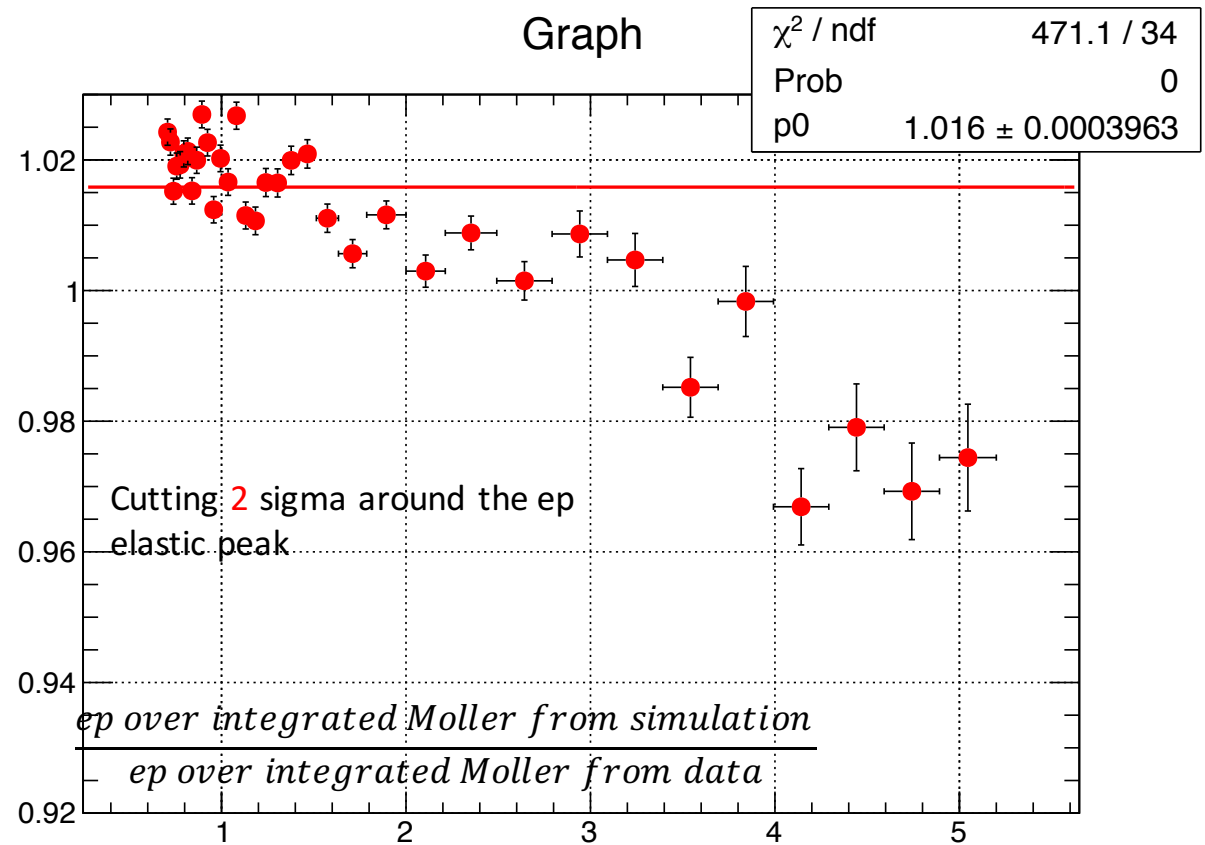$$\frac{ep \; over \; integrated \; Moller \; from \; simulation}{ep \; over \; integrated \; Moller \; from \; data}$$

- Currently having some problem with data in transition and LG region

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  - The smaller the cut, the better the agreement

GEM efficiency from the simulation

gem_efficiency_ep

gem_efficiency_ep	
Entries	35
Mean	1.853
RMS	1.293