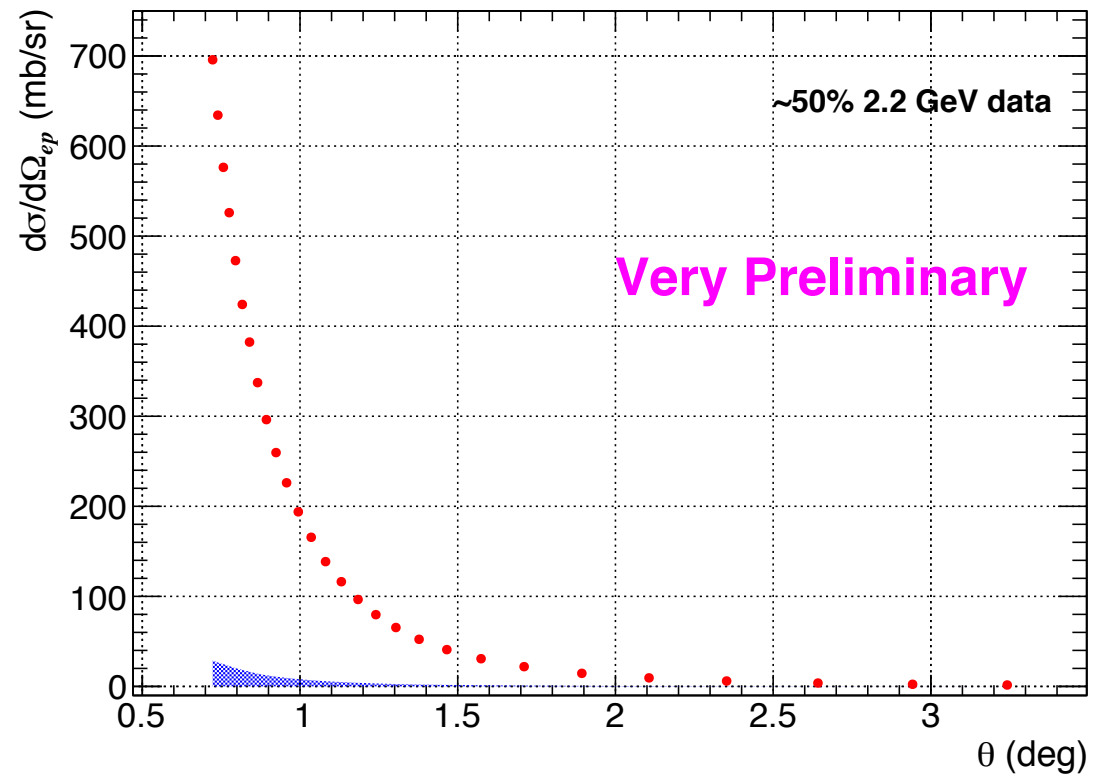
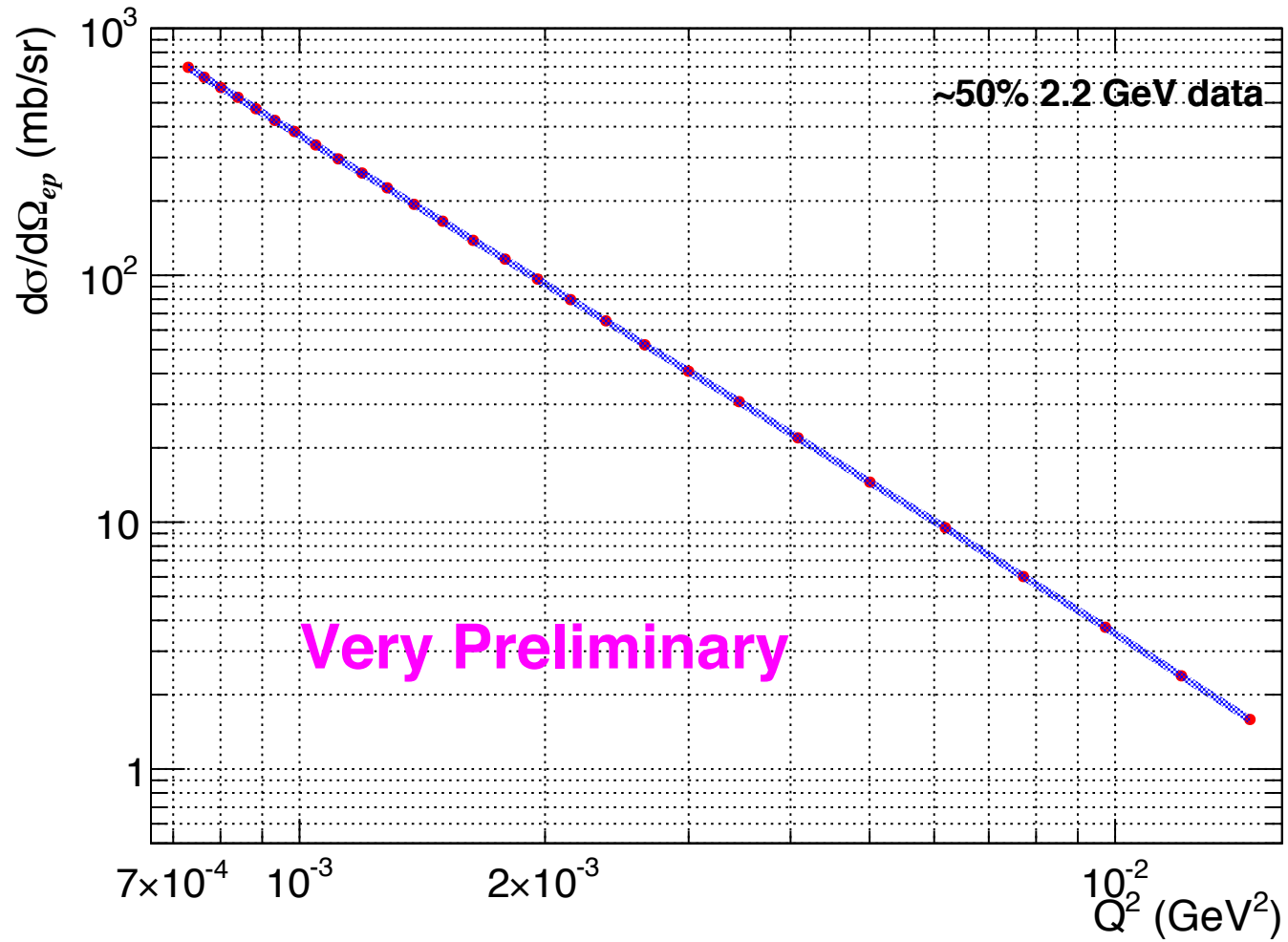


- For $\theta < 2.0$ deg, using hybrid Moller selection method: use HyCal to select double arm Moller, don't require two GEM hits at the same time
 - Energy independent part of GEM efficiency canceled
- For $\theta > 2.0$ deg, using integrated Moller method
 - Still using hybrid Moller method to select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

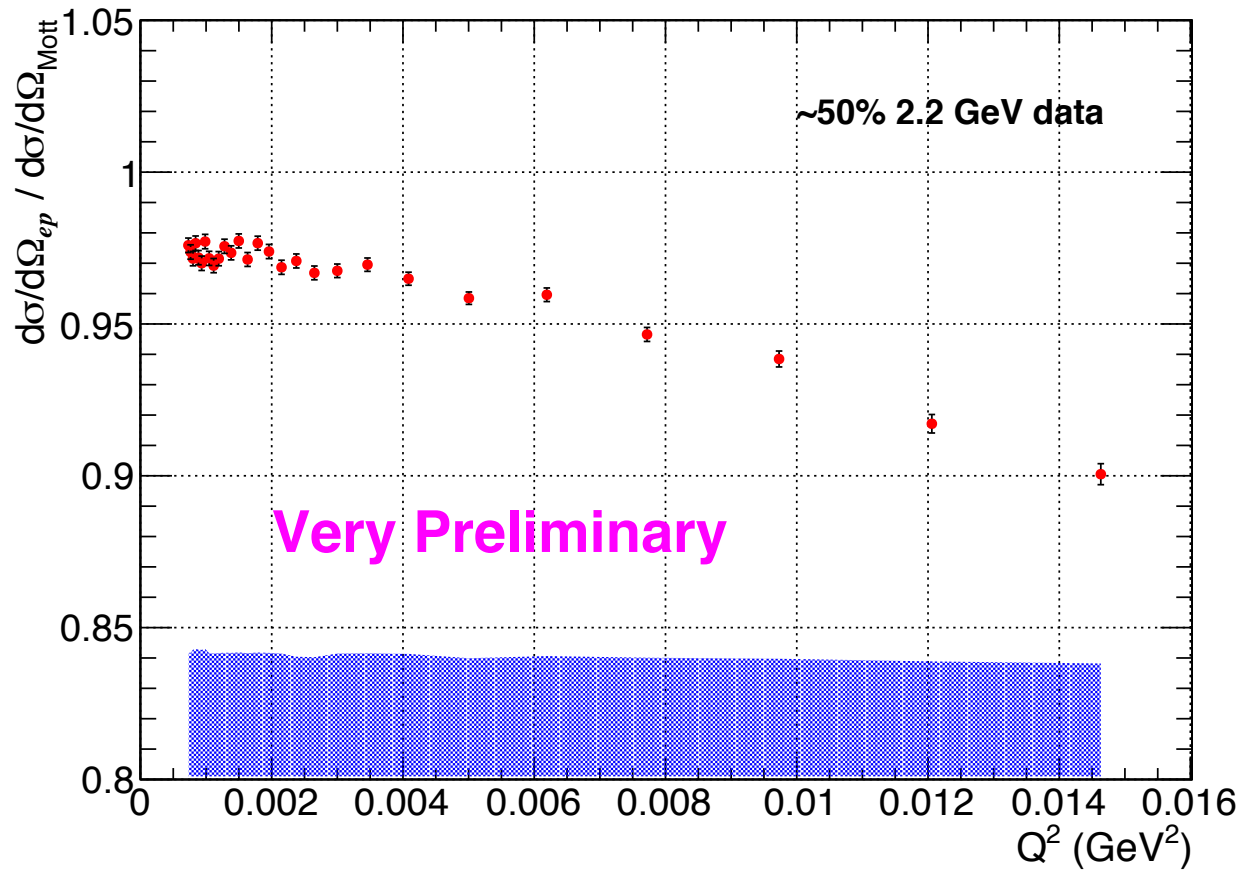


ep elastic scattering cross section



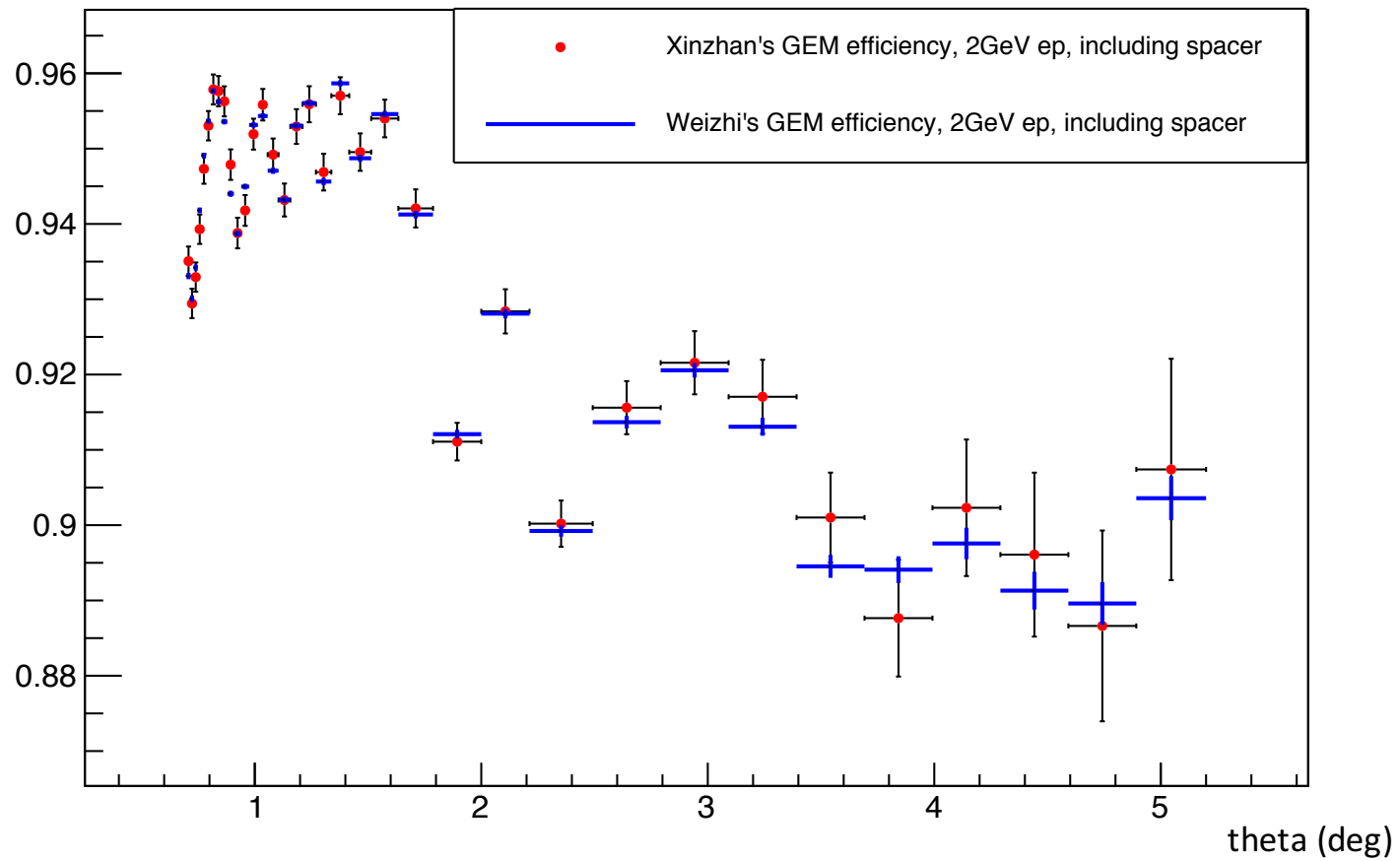
$$\frac{\frac{d\sigma}{d\Omega_{ep}}}{\frac{d\sigma}{d\Omega_{Mott}}} = \frac{E'}{E} \frac{1}{1 + \tau} \left(G_E^2 + \frac{\tau}{\epsilon} G_M^2 \right)$$

Normalized ep elastic scattering cross section



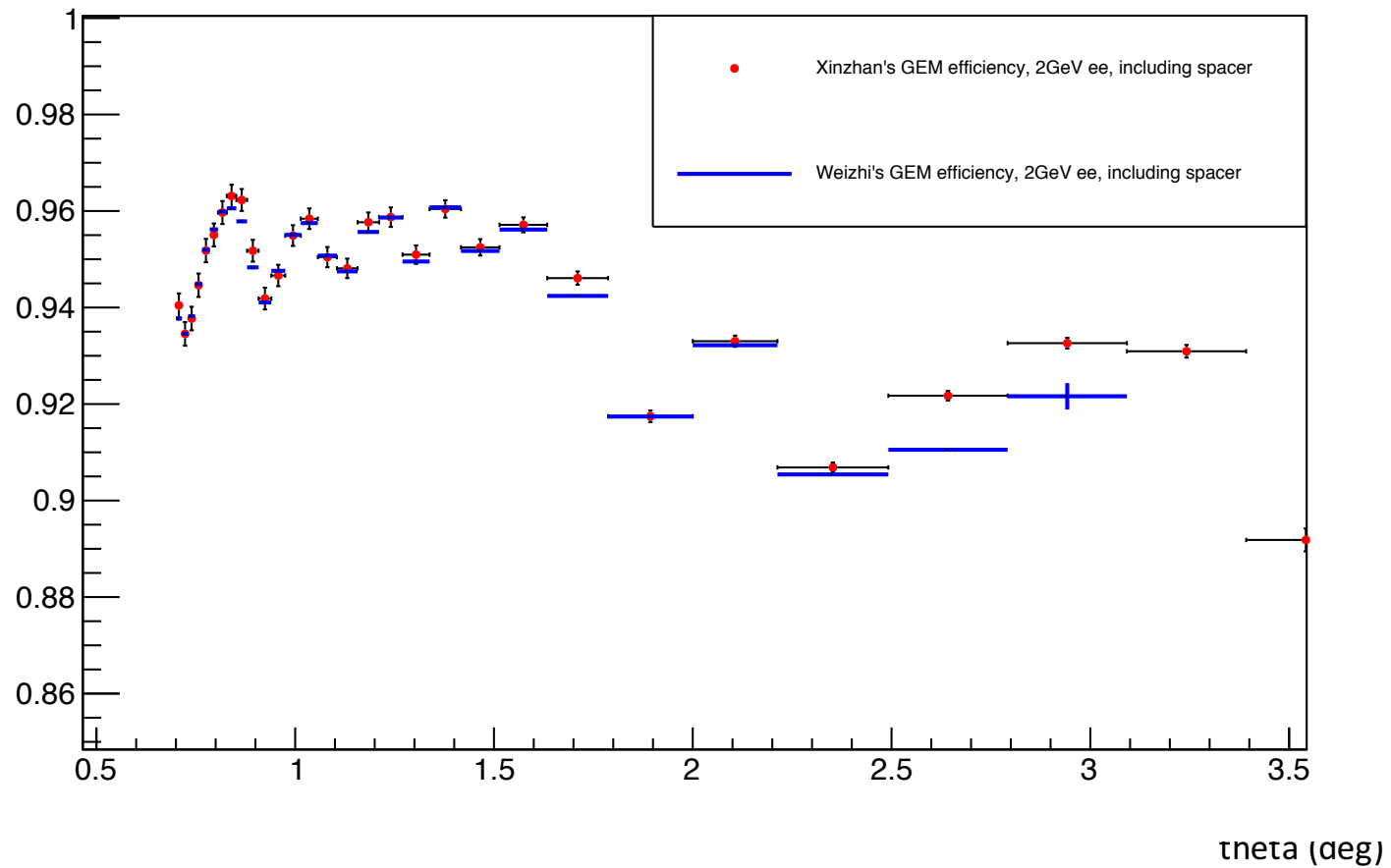
Consistency check for the GEM efficiency

Graph



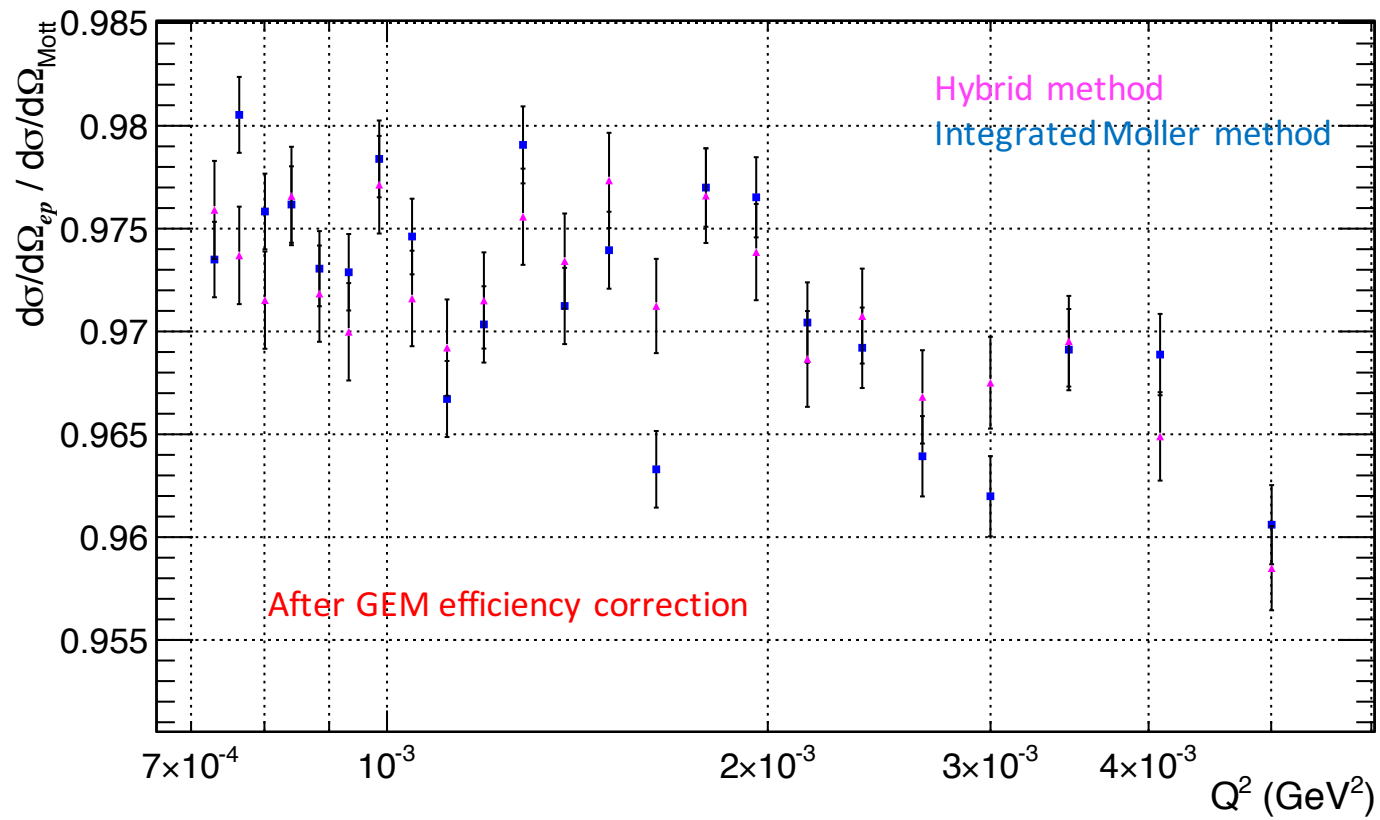
Consistency check for the GEM efficiency

Graph



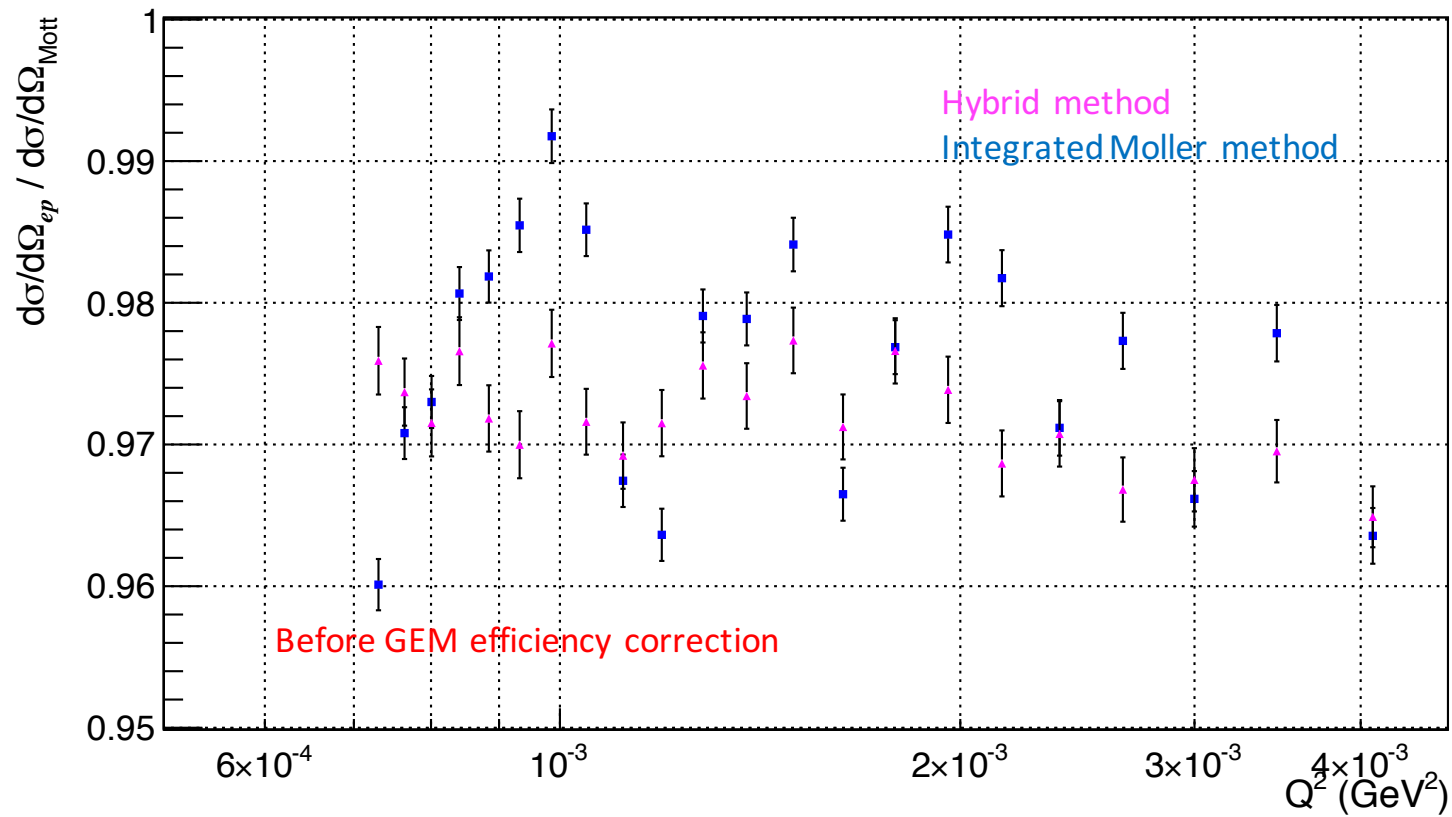
Using data point with theta < 2 deg to check the systematic of GEM efficiency.

Graph

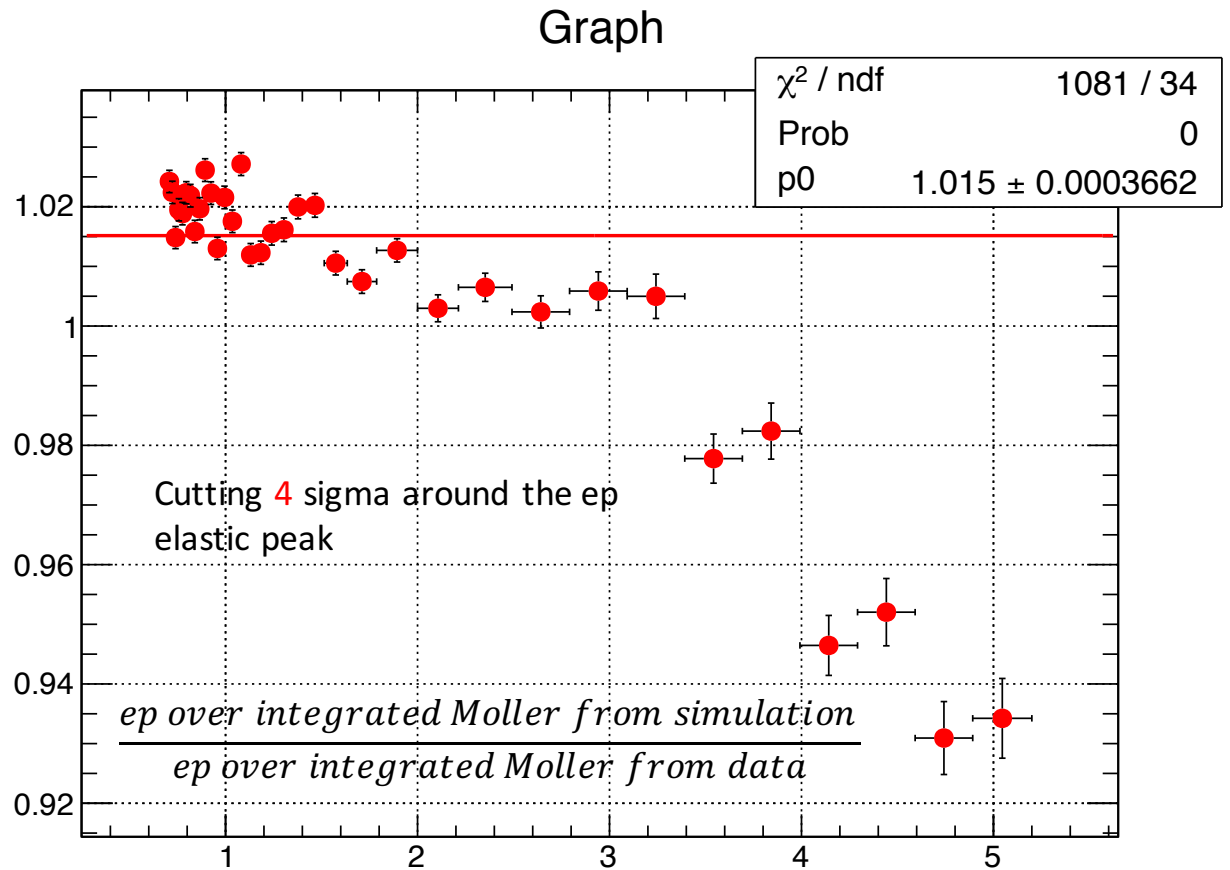


Using data point with theta < 2 deg to check the systematic of GEM efficiency.

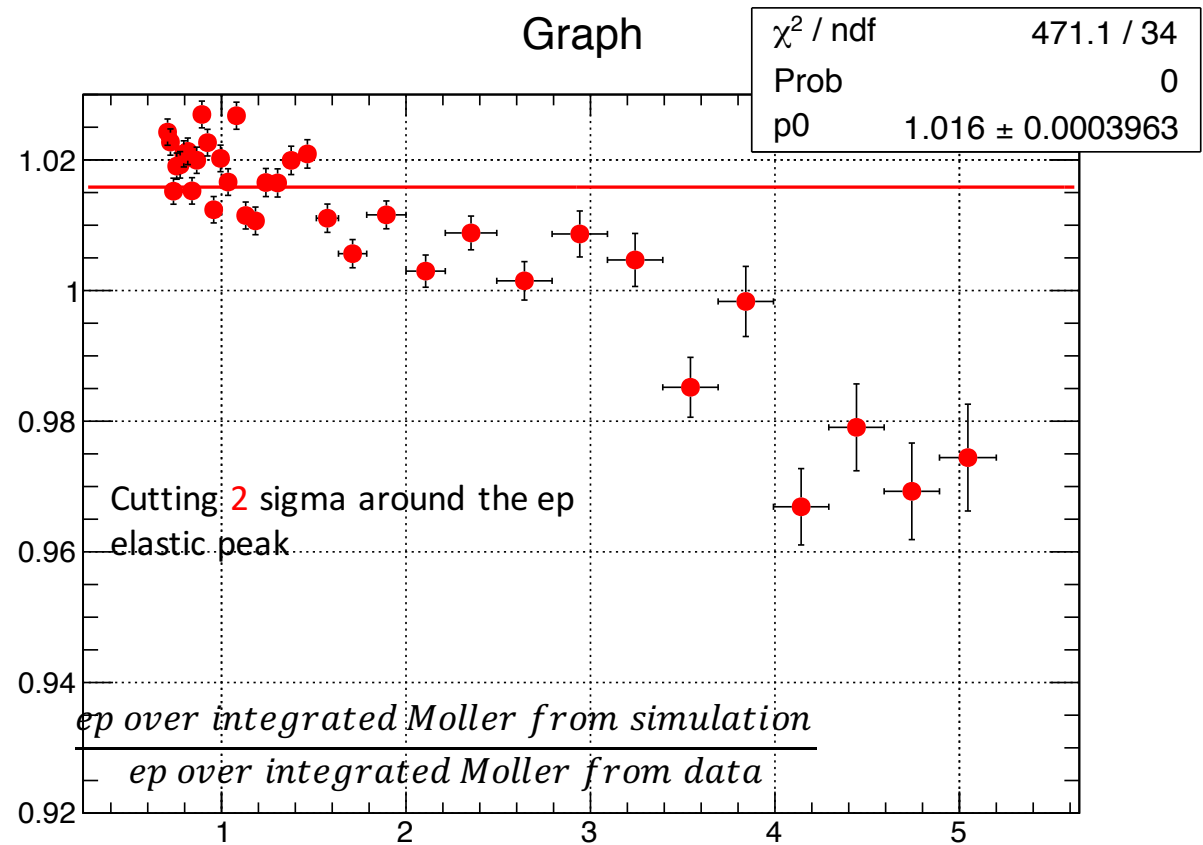
Graph



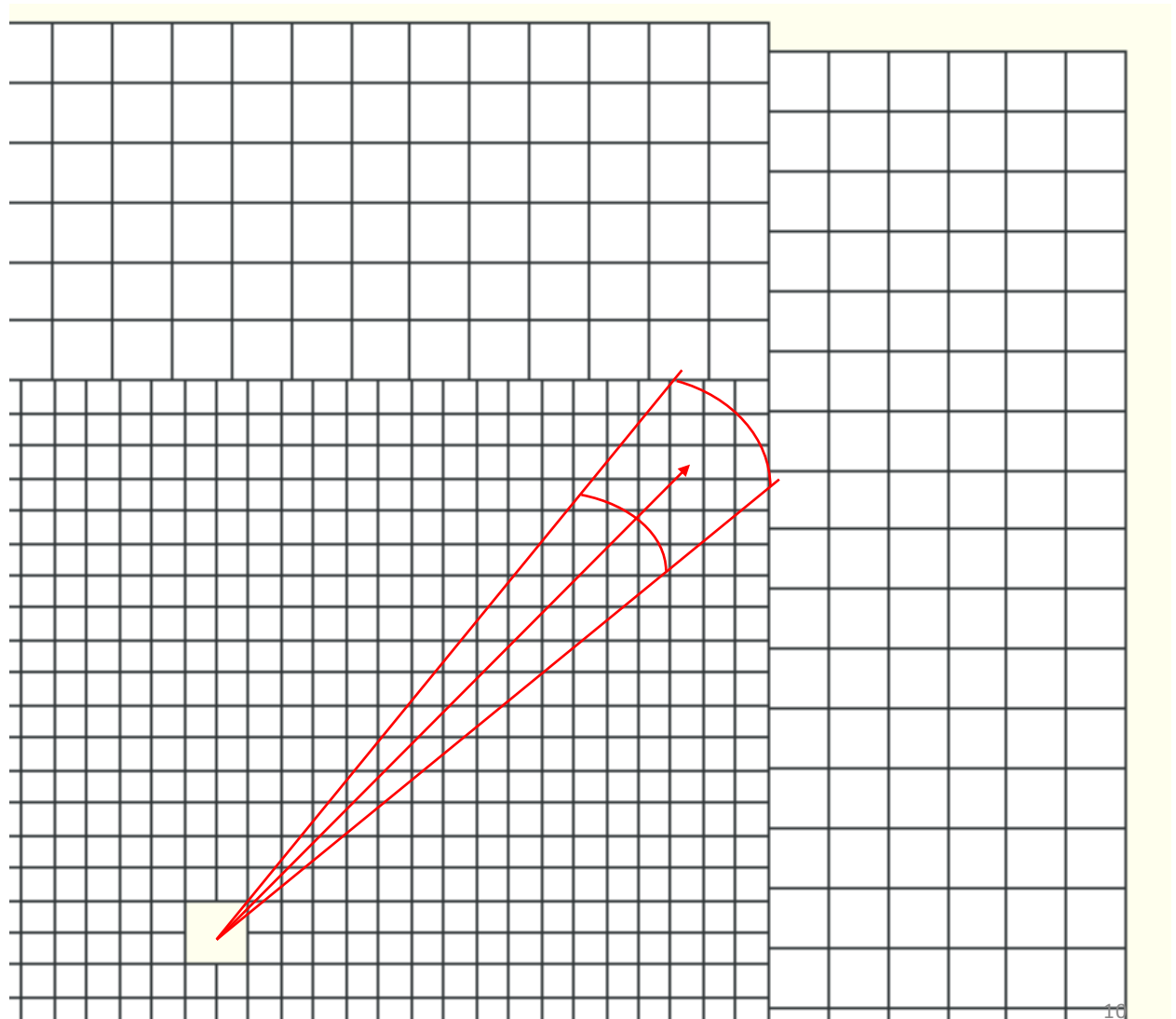
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- Simulation and data match very bad in these two region
- The discrepancy seems to depend on size of cut around the elastic peak
 - The smaller the cut, the better the agreement



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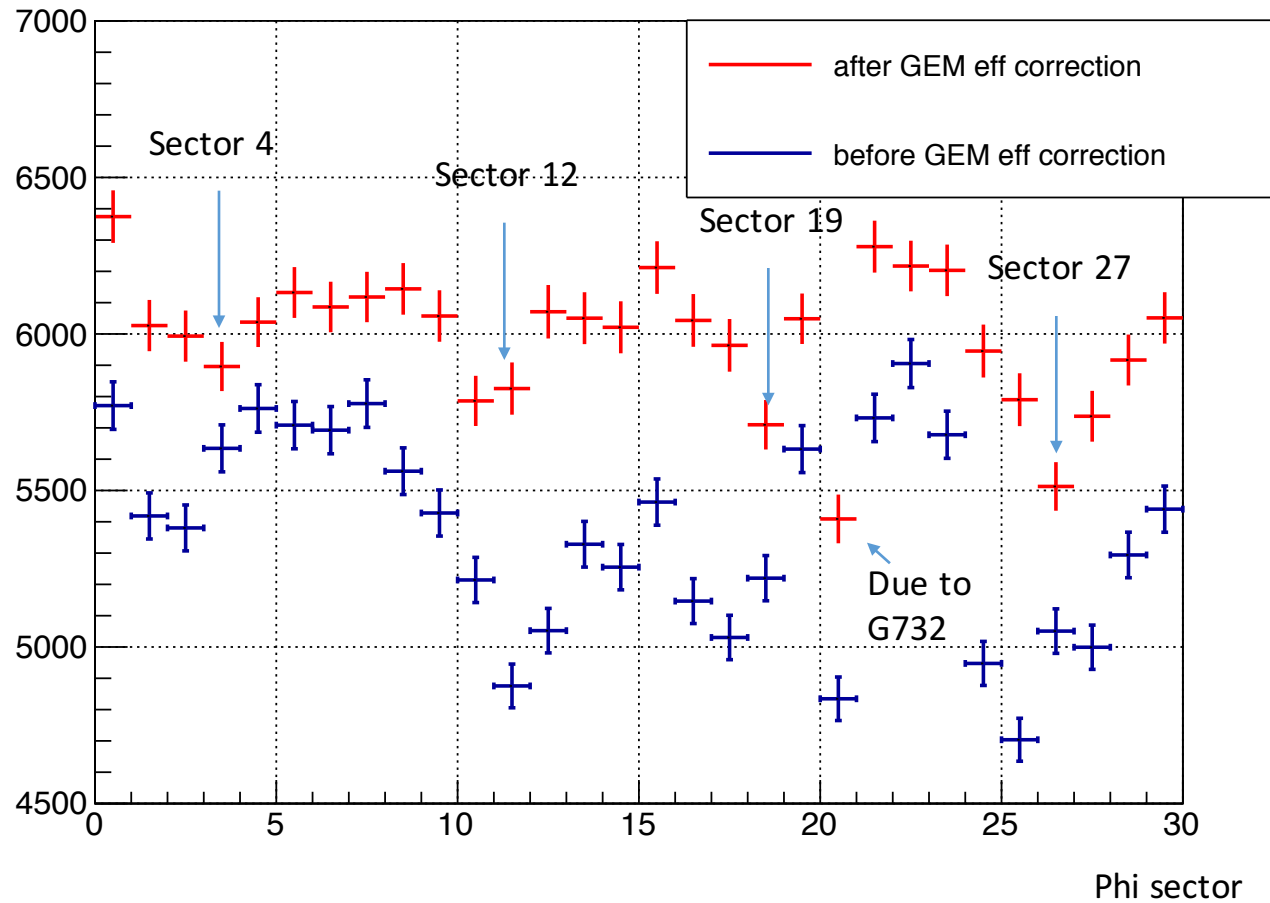


- Divide HyCal into 30 sectors, each with 12 deg azimuthal angle coverage (first one starts from 3 to 15 deg)
- Look at the ep yield in a ring with $|R - 425.7| < 1.5 * 29.34$ mm
- So for sectors 4, 12, 19, and 27, they cover the corner of PWO, otherwise transition or LG

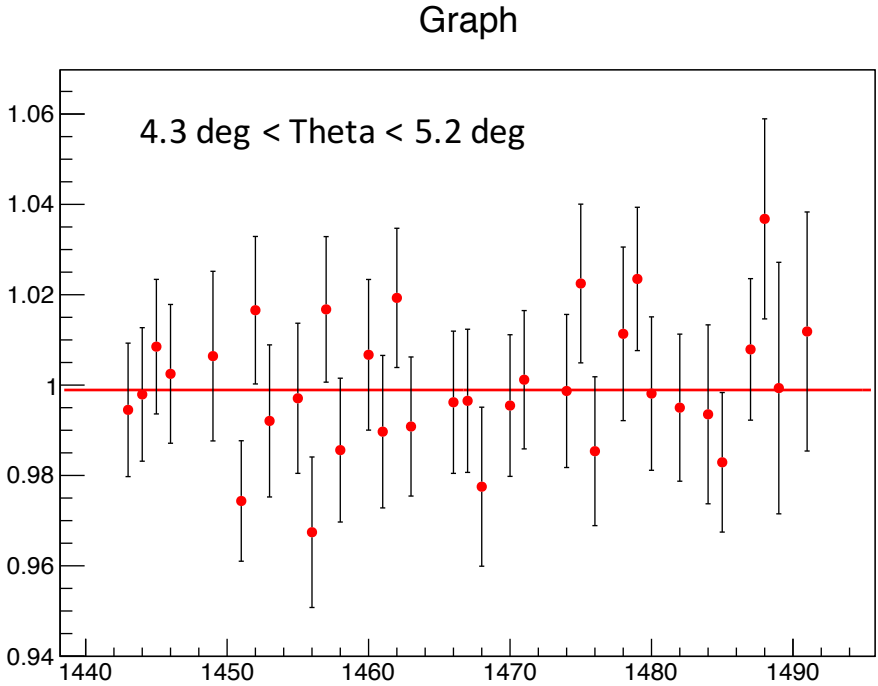
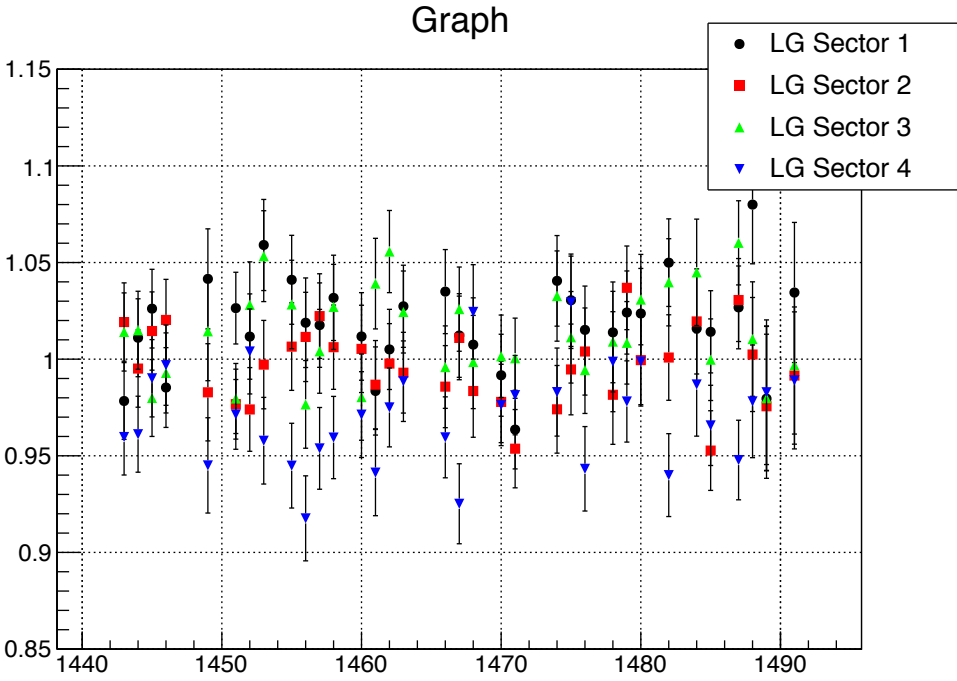


ep yield by phi sectors

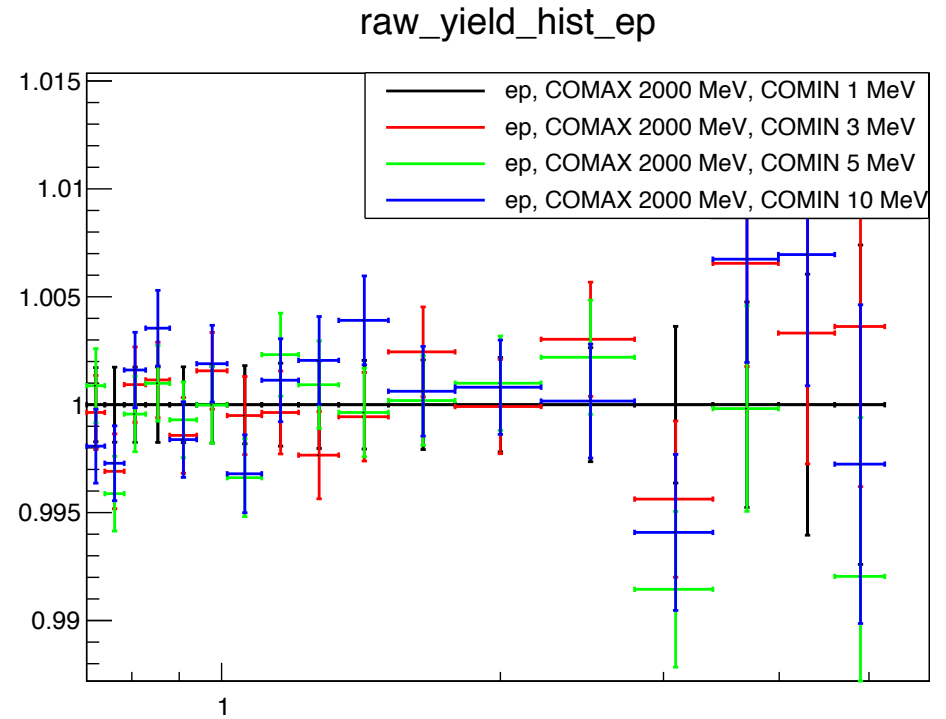
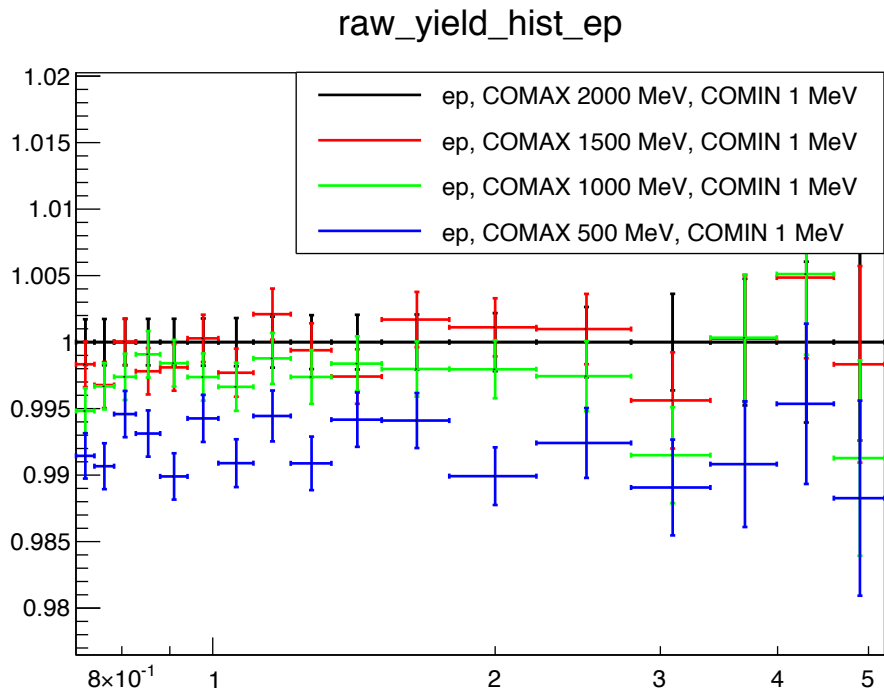
signal_sector_yield_ep



Stability of LG ep yield



Testing Gramolin's ep generator behavior



Maximum cut off should not be less than 1000 MeV

To-do

- Continue understand the LG problem
 - If it turn out to be some sort of background or pile up, what can we do to suppress them
- New ee generator test is still on-going