

Run 3 Forward Electron Energy Calibration in ATLAS

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DESY

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$$\frac{\sigma_E}{E} = \frac{a}{\sqrt{E}} \oplus \frac{b}{E} \oplus c \quad (1)$$

$$\left(\frac{\sigma}{E}\right)^2 = \quad (2)$$

- STEP 1: Skimming ntuples
- STEP 2: Histogramming E_{reco}/E_{true}
- STEP 3: Extracting σ from histograms
- STEP 3+: Plotting σ dependence over μ
- BONUS 1: Add cookie-cutting
- BONUS 2: Repeat the study for central electrons

- **Binning in η_{probe} ($N_\eta = 9$ edges):**

$\{2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.35, 3.5, 3.7, 3.9, 4.1, 4.3, 4.9\}$

- **Binning in η_{tag} ($N_\eta = 8$ bins):**

$\{0.0, 0.9, 1.37, 1.52, 1.81, 2.0, 2.15, 2.3, 2.5\}$

- **Binning in p_T ($N_{p_T} = 7$ bins):**

$\{20, 30, 40, 50, 1000\}$ GeV

- **Binning in μ ($N_\mu = 6$ bins):**

$\{0, 30, 40, 50, 55, 60, 70, 100\}$

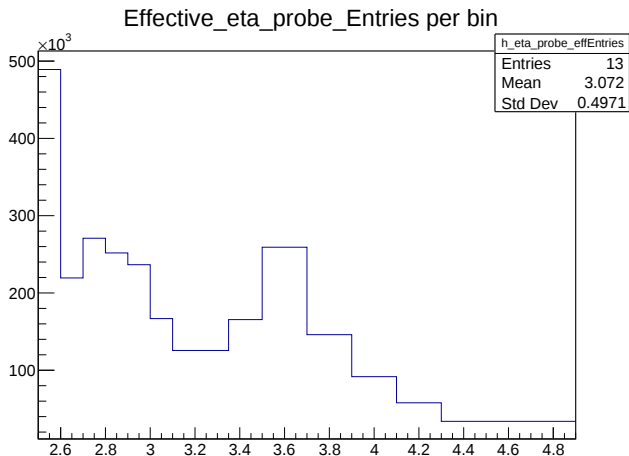


Figure: Effective statistics for different η_{probe} binning

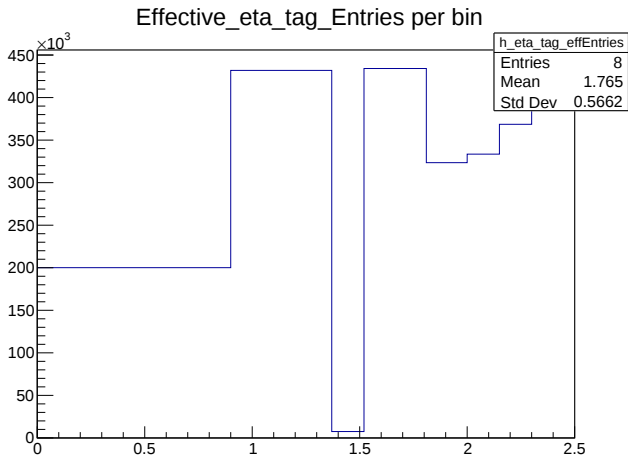


Figure: Effective statistics for different η_{tag} binning

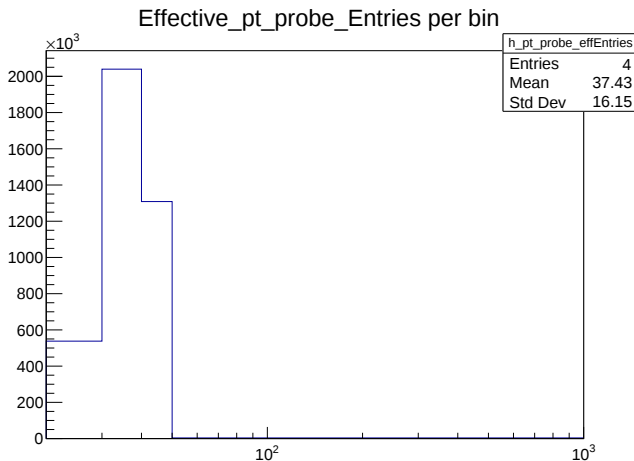


Figure: Effective statistics for different p_t^{probe} binning

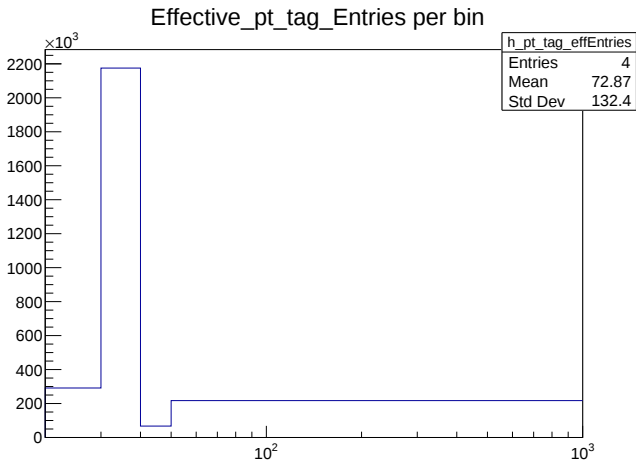


Figure: Effective statistics for different p_t^{tag} binning

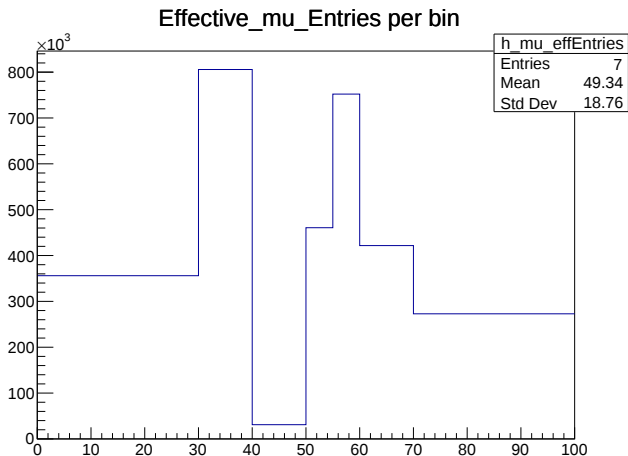
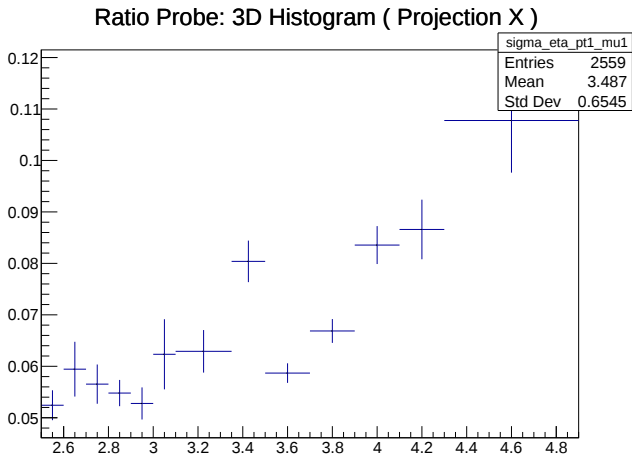
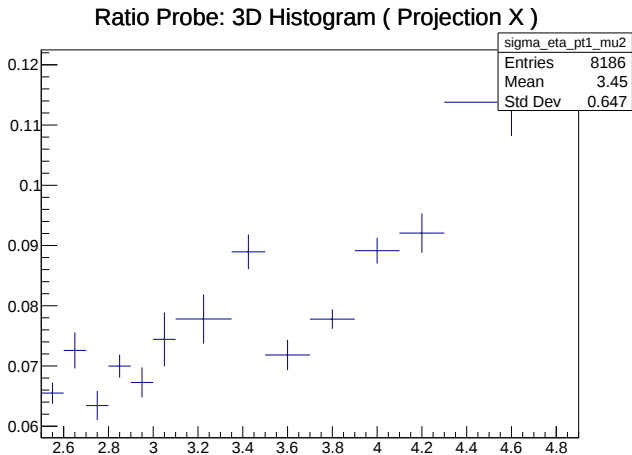
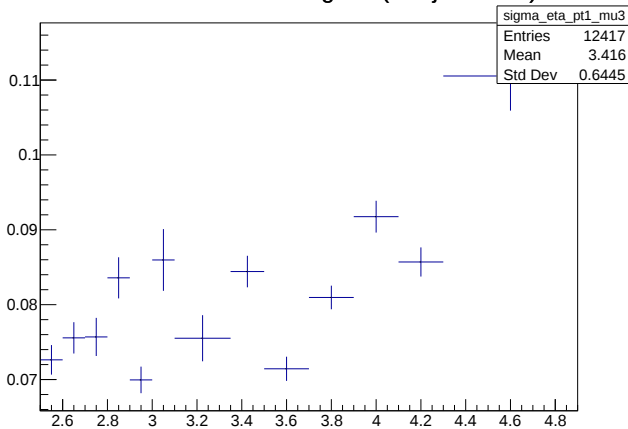


Figure: Effective statistics for different μ binning

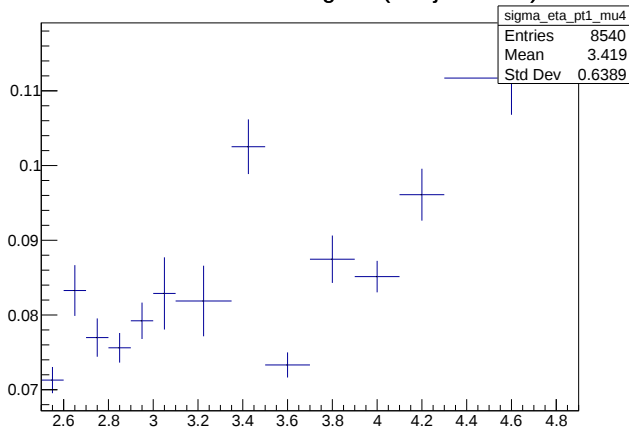




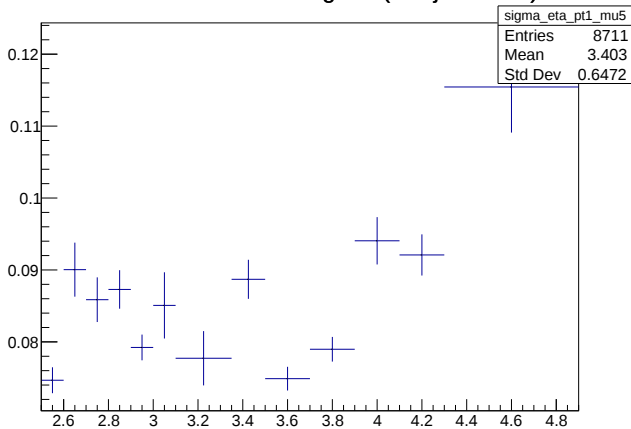
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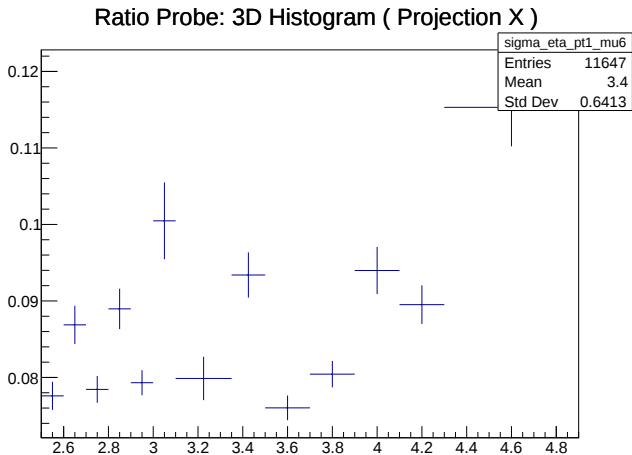


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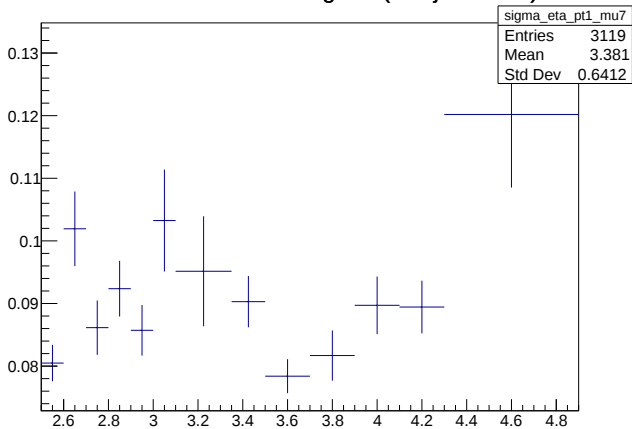


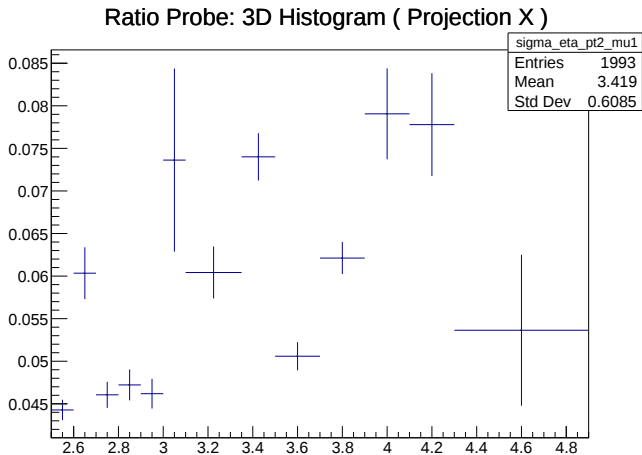
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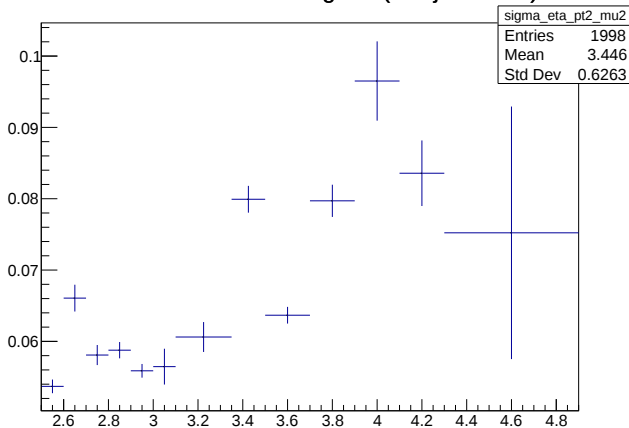


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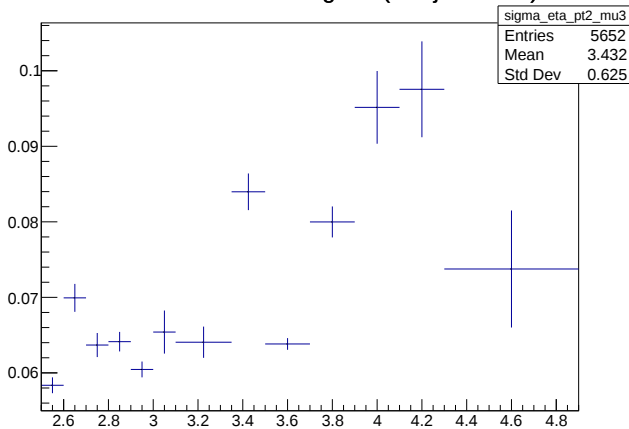


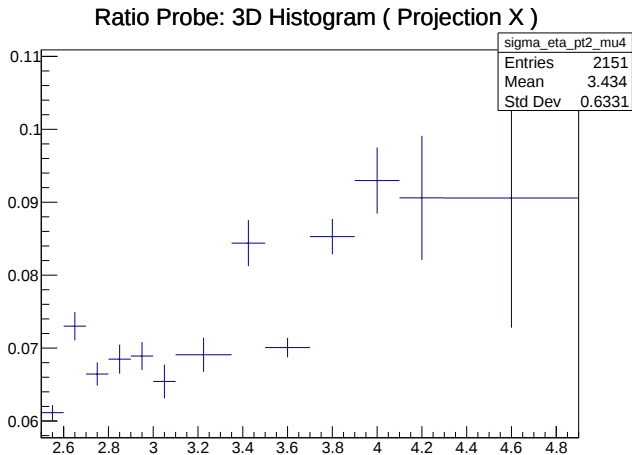


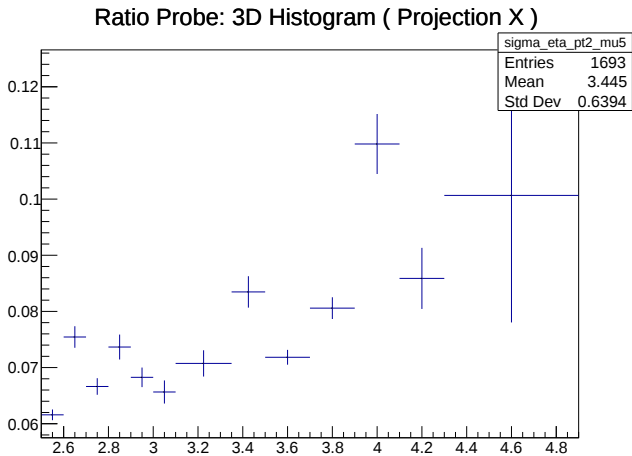
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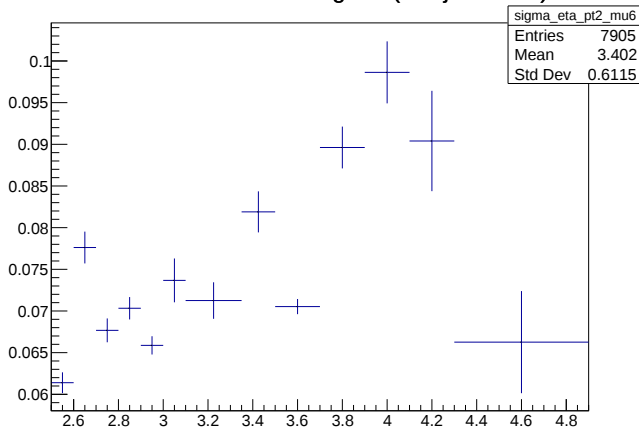
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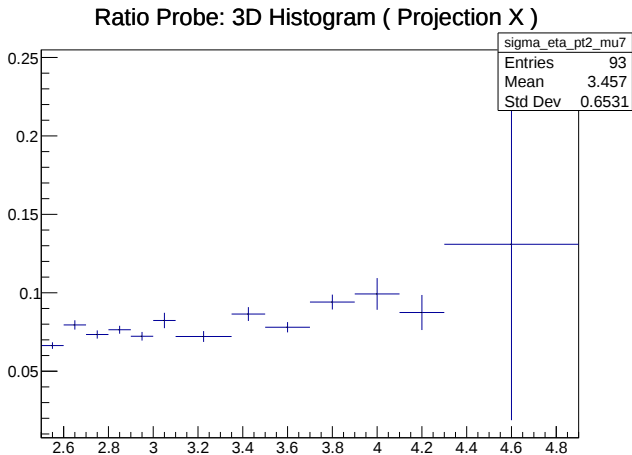




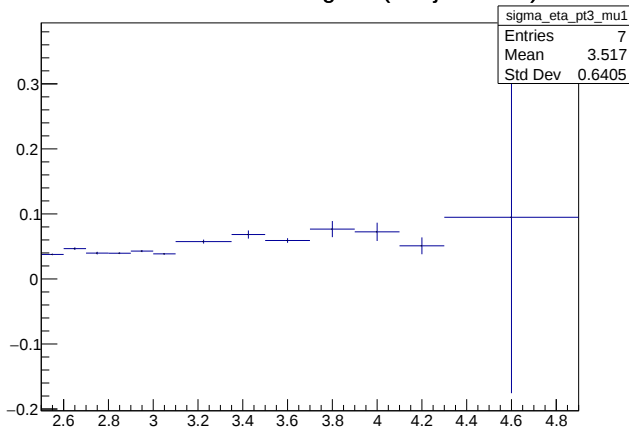


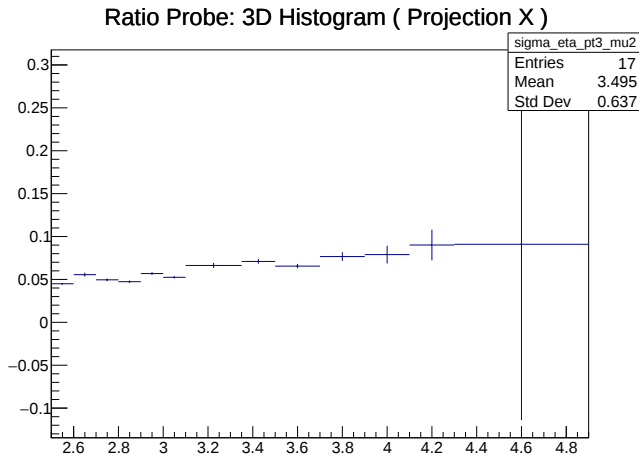
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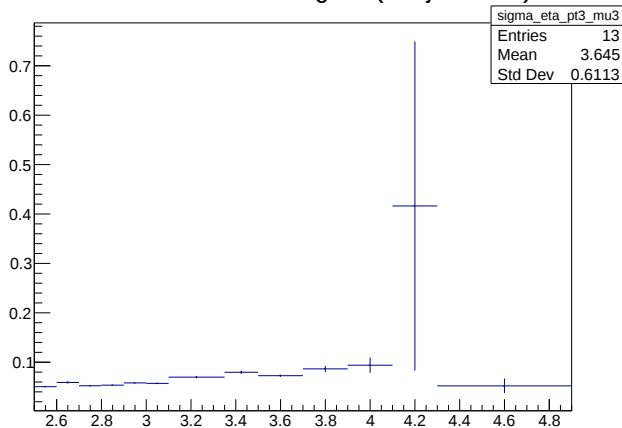


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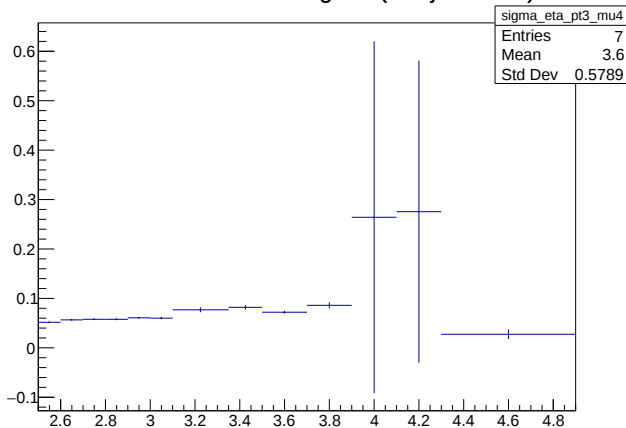




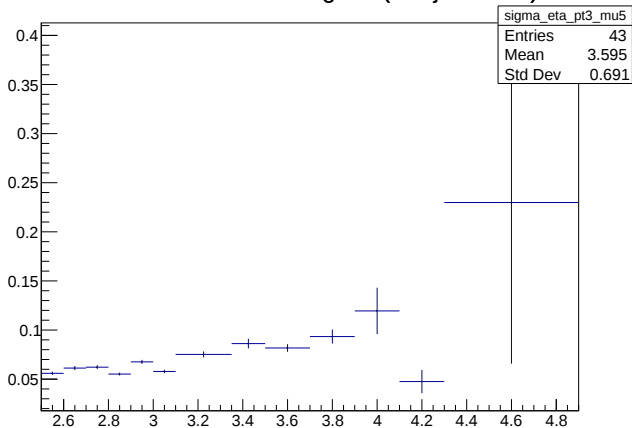
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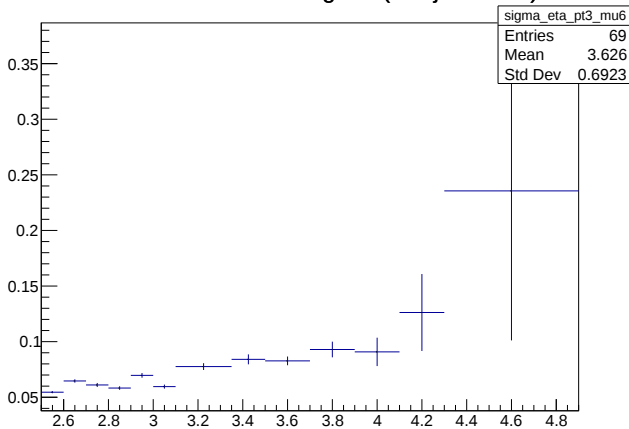
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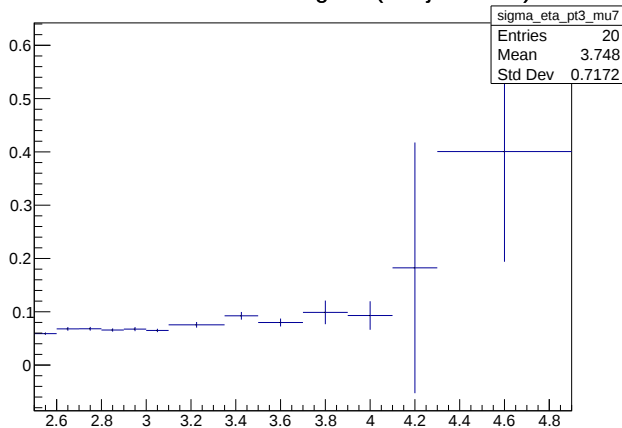
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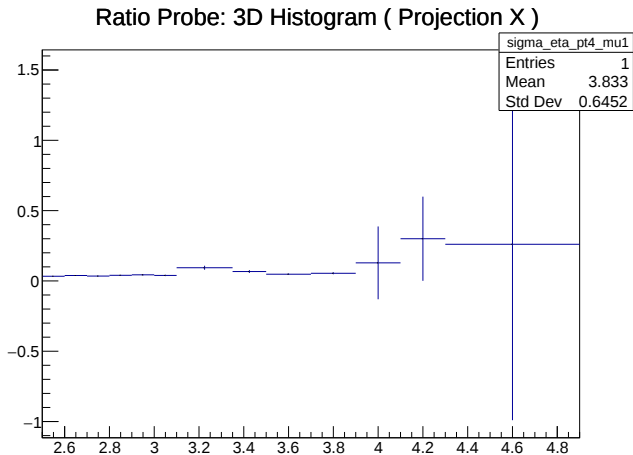


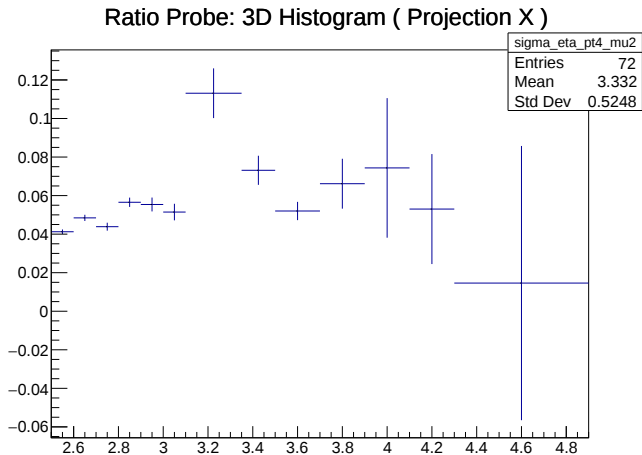
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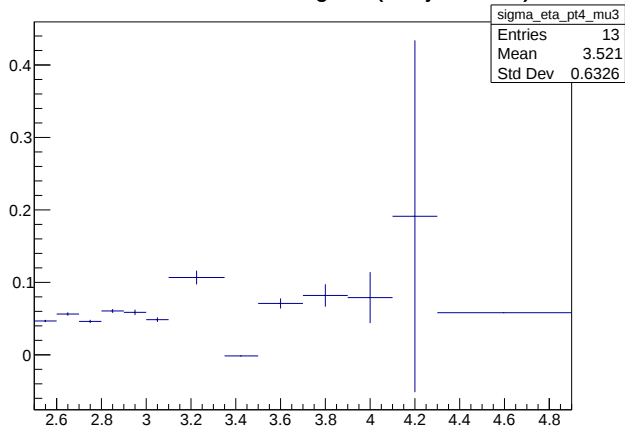
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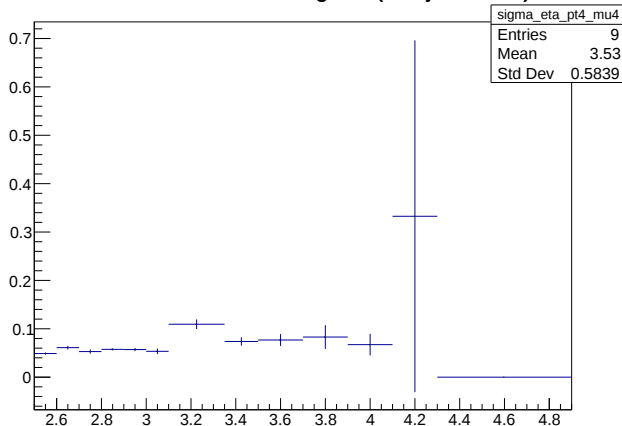


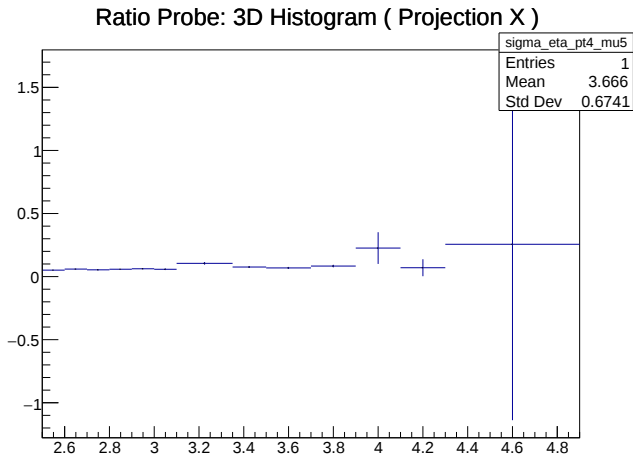


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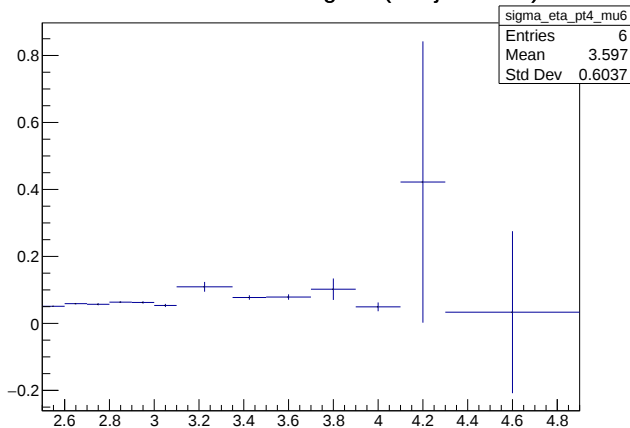


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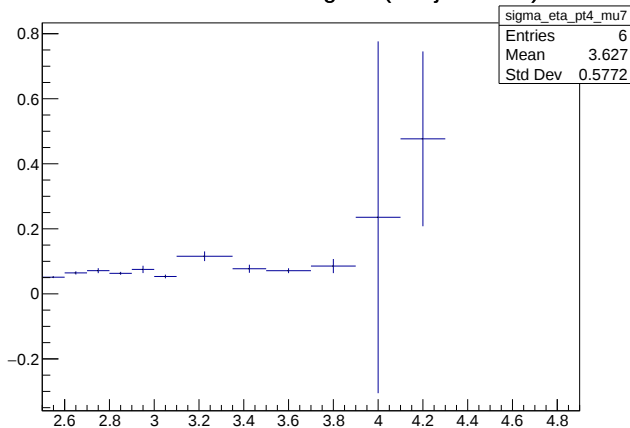


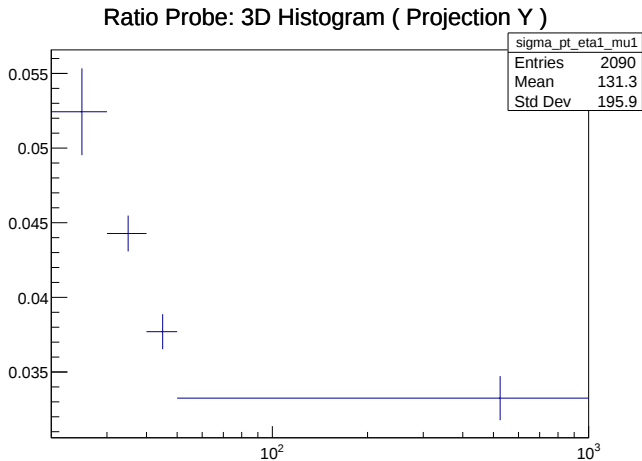


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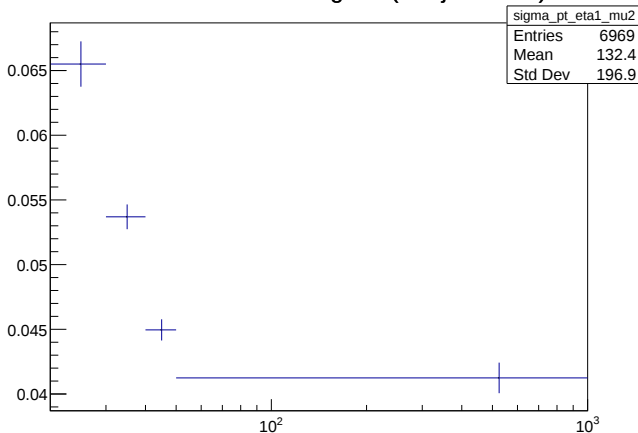


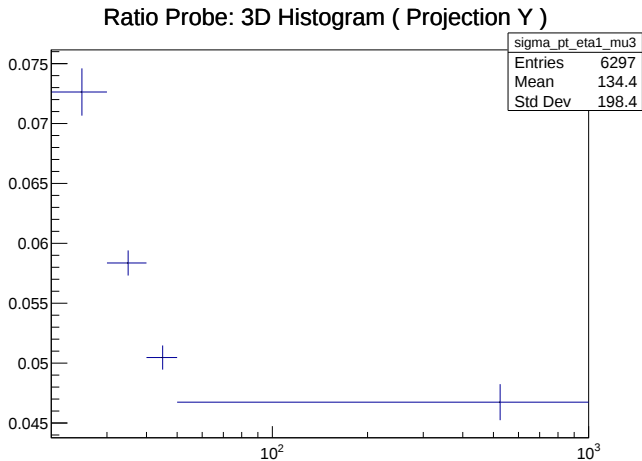
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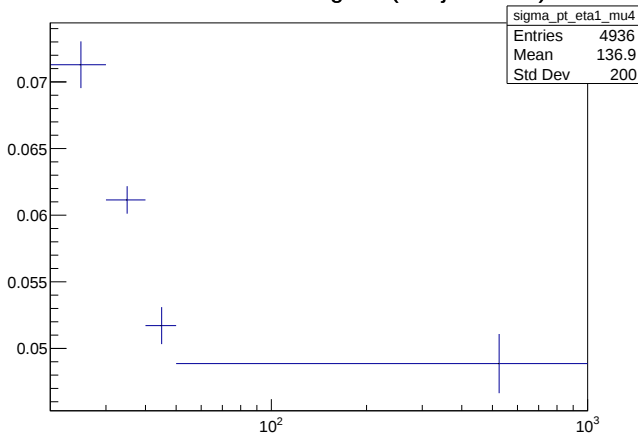


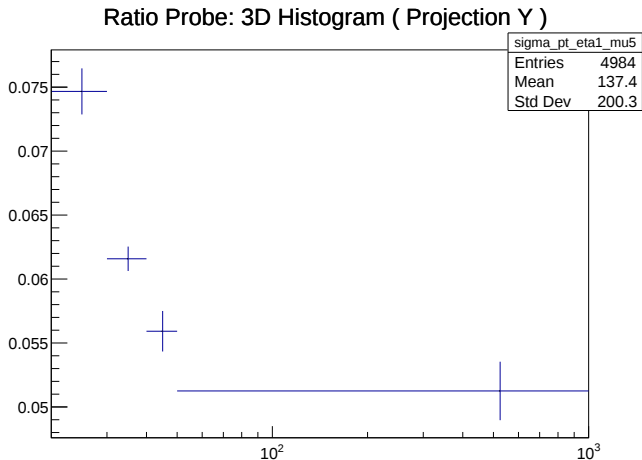
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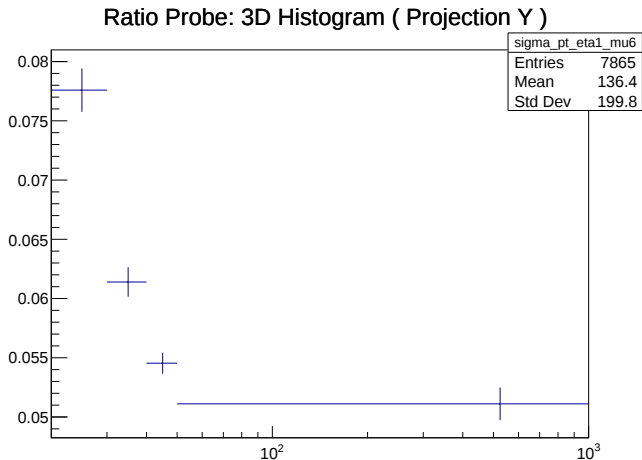


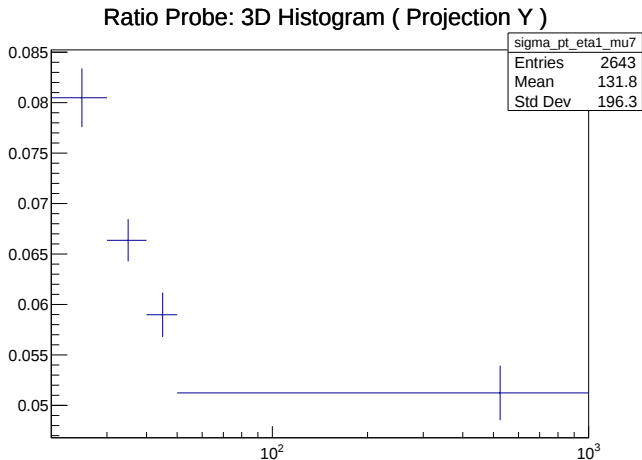


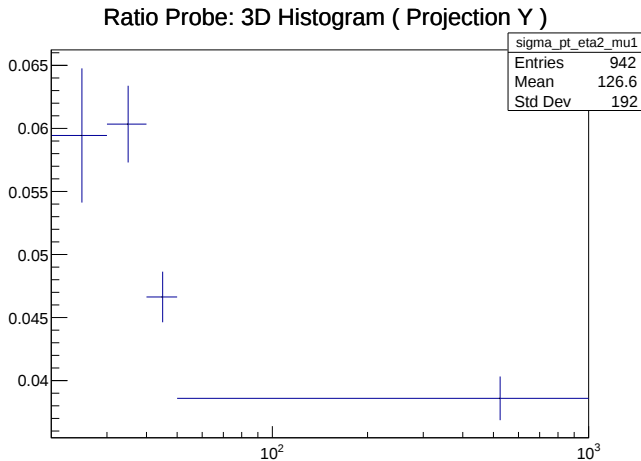
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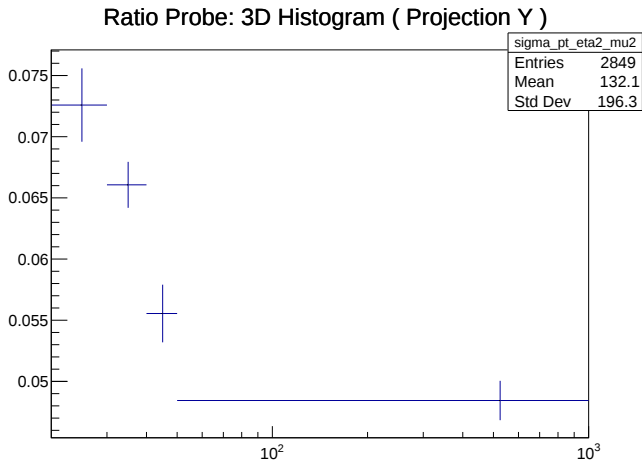


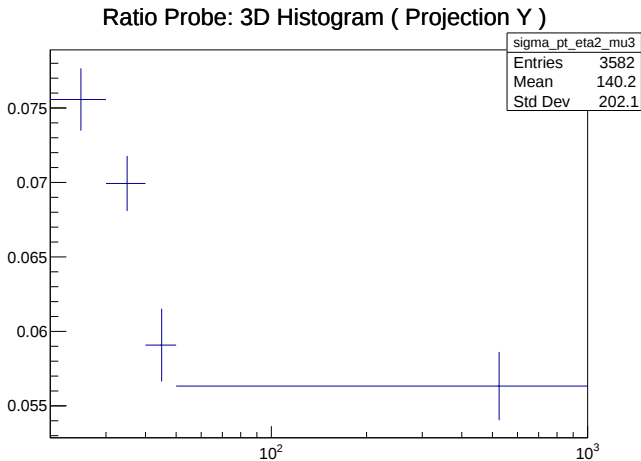


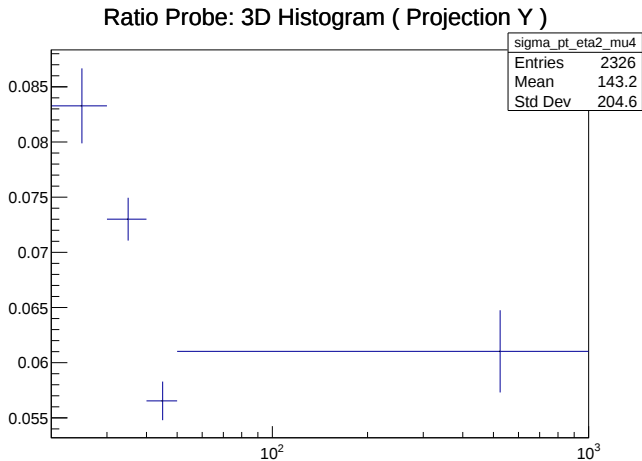


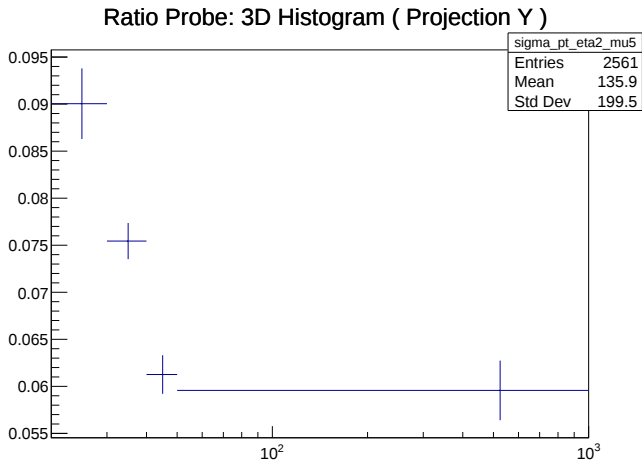


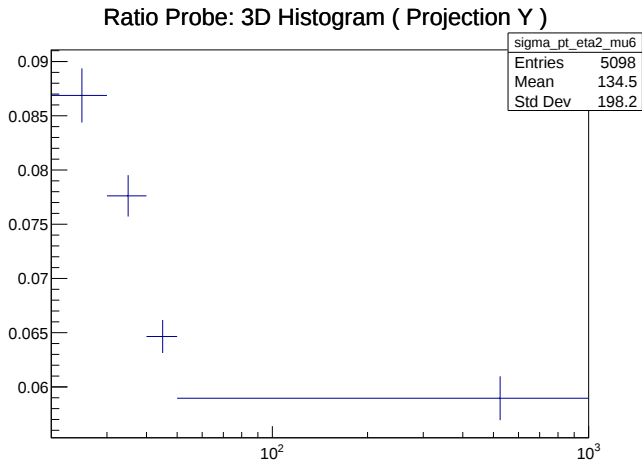


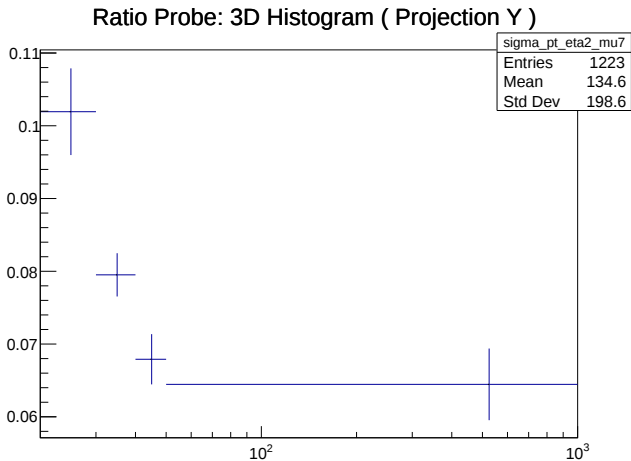


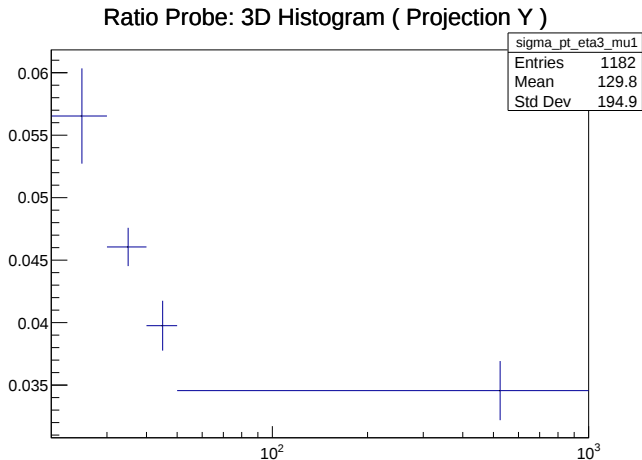


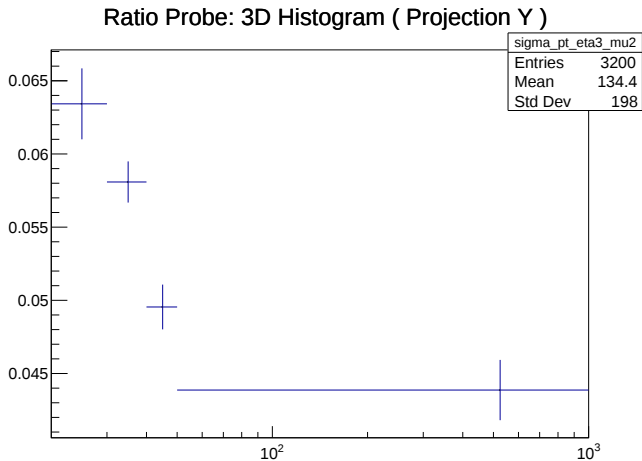


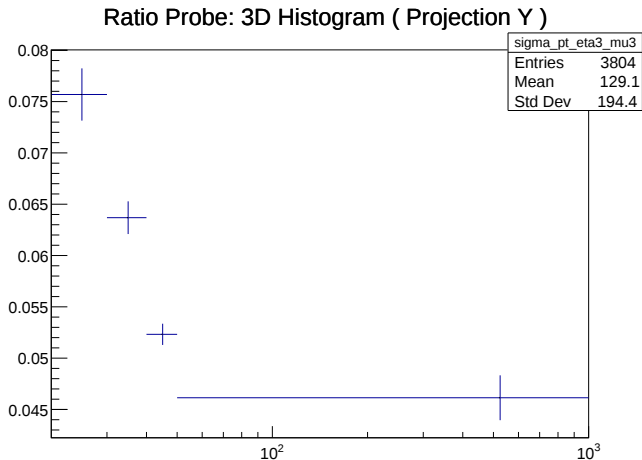


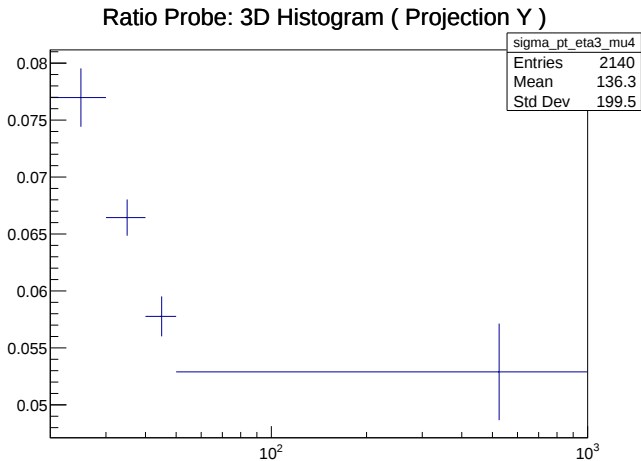


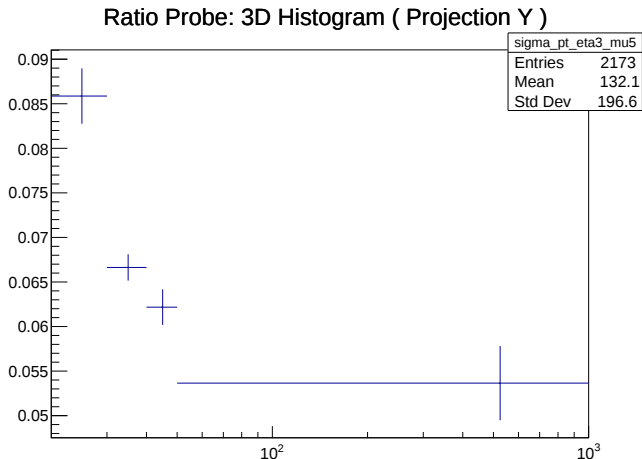


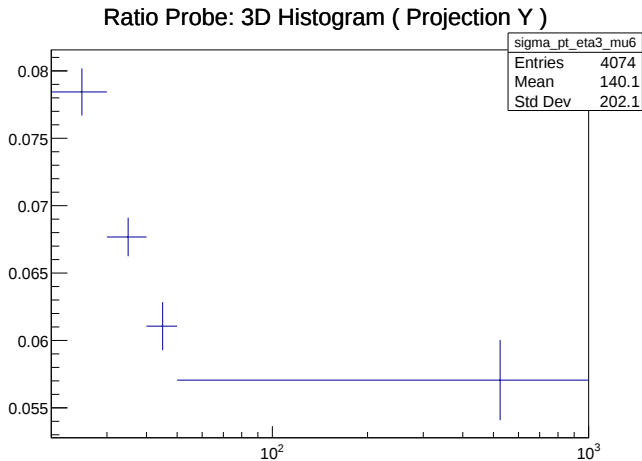




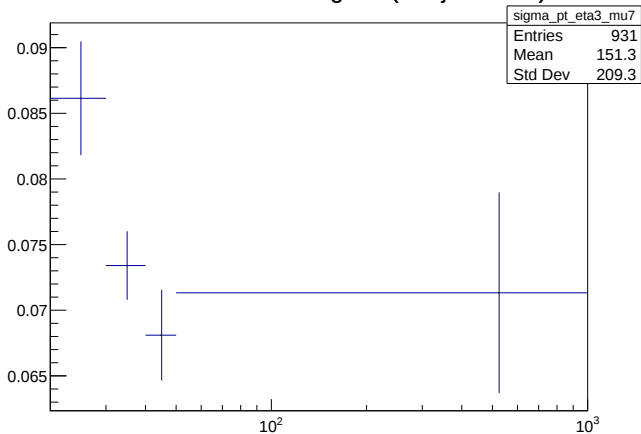


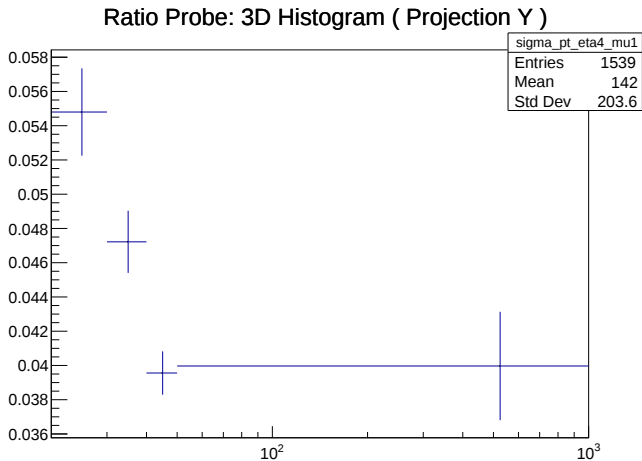




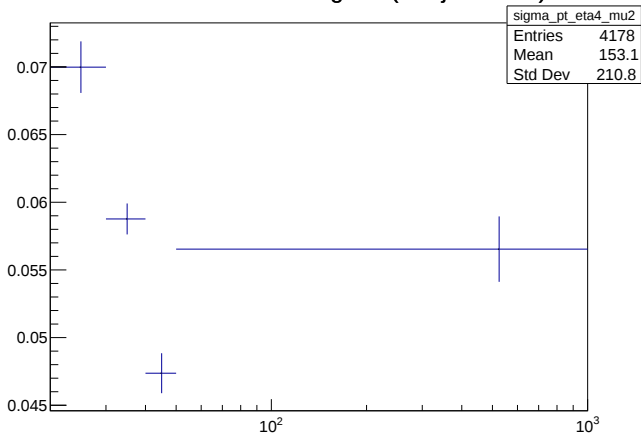


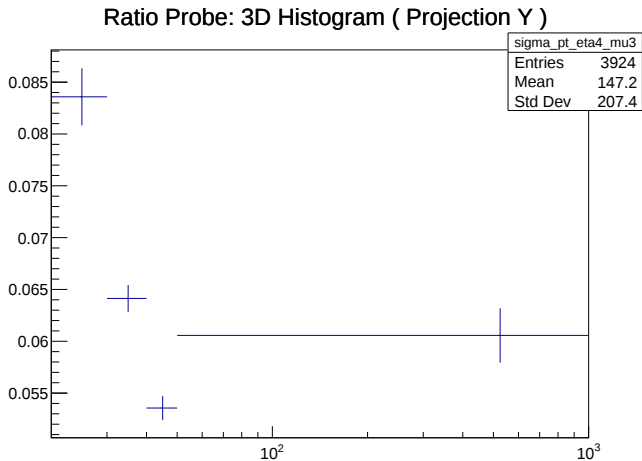
Ratio Probe: 3D Histogram (Projection Y)

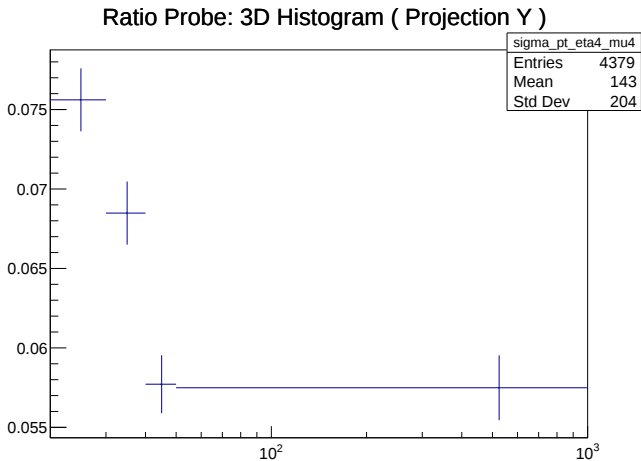


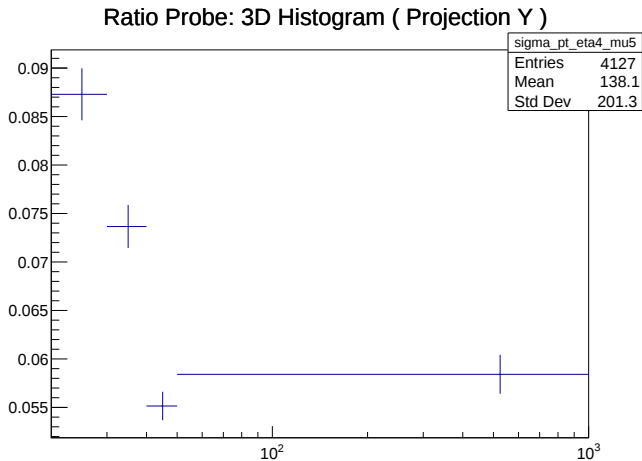


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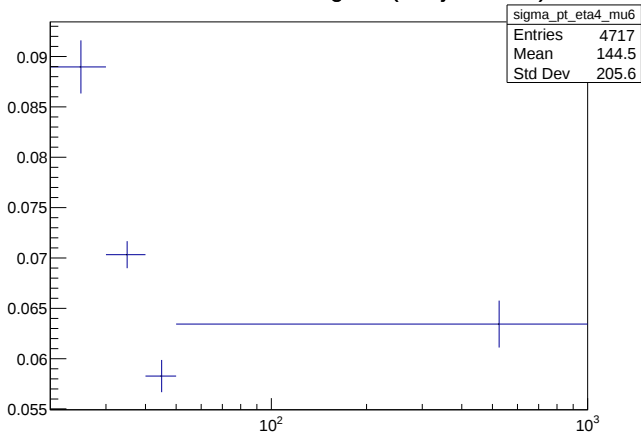


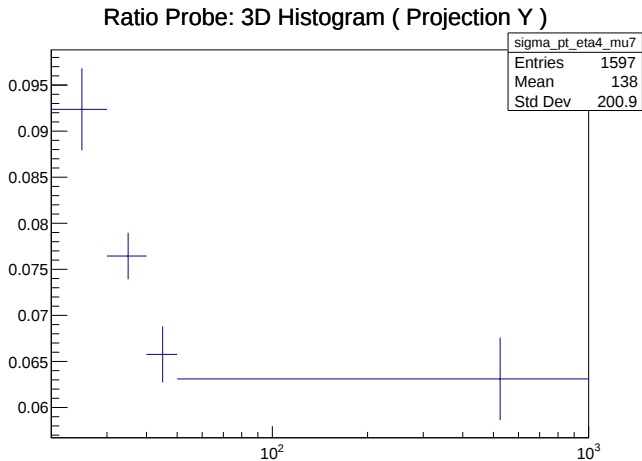




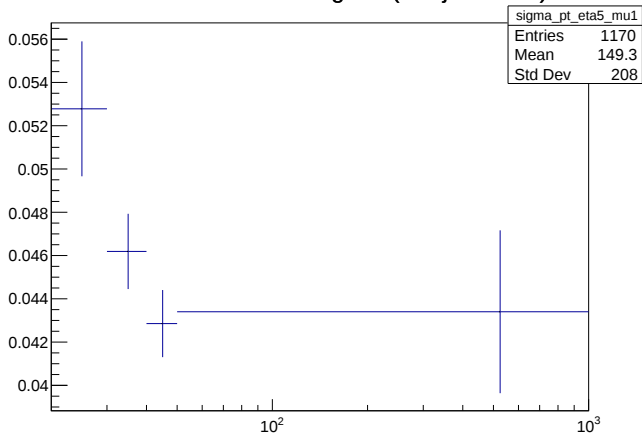


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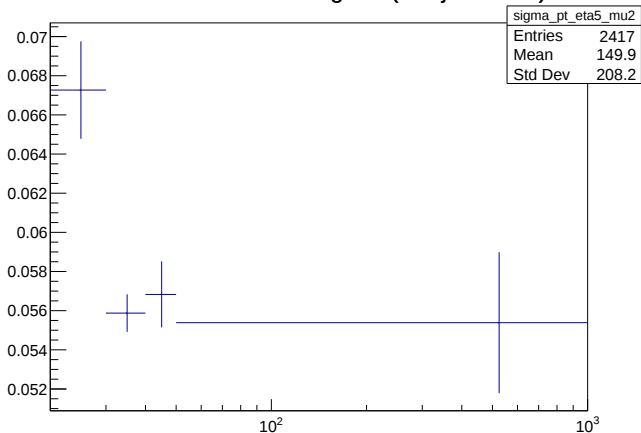


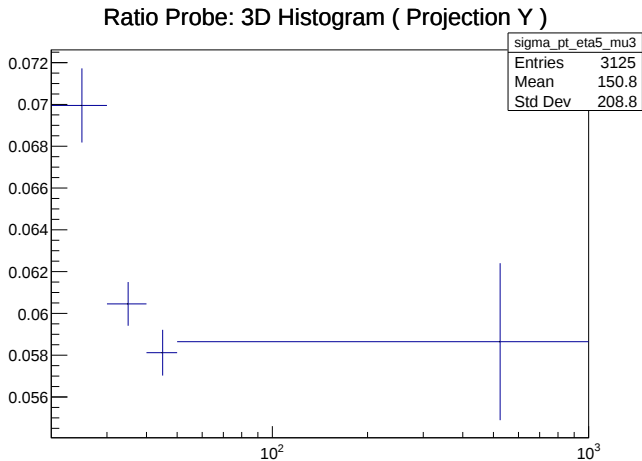


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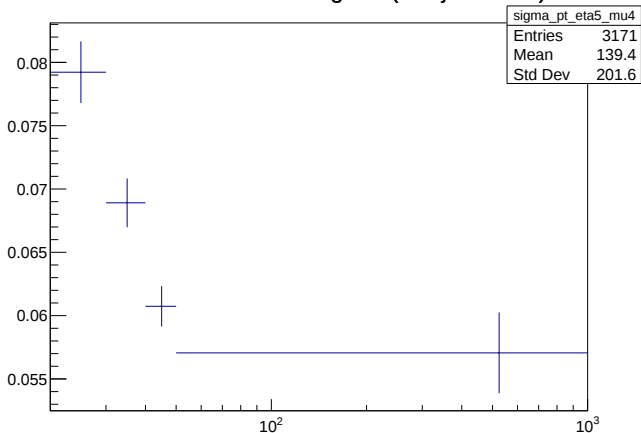


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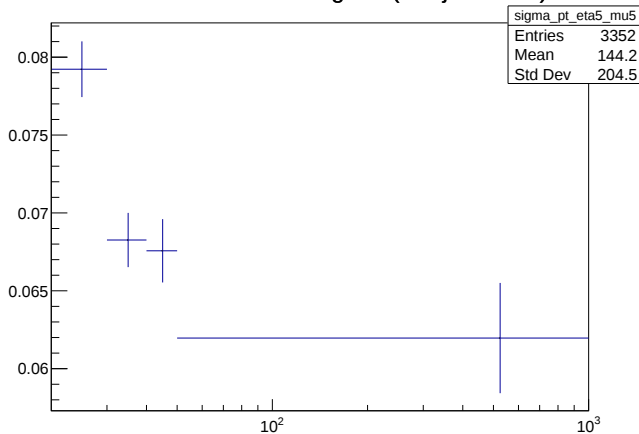




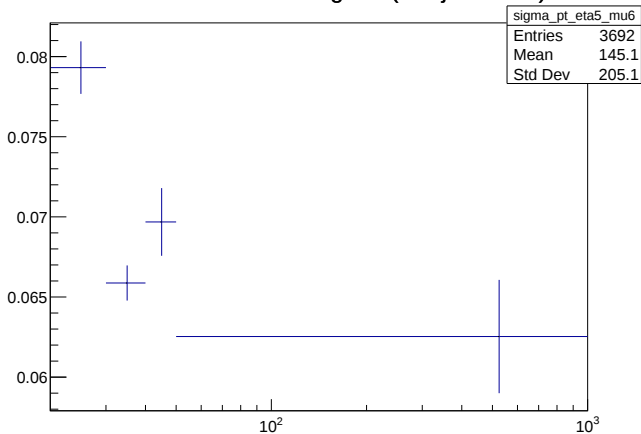
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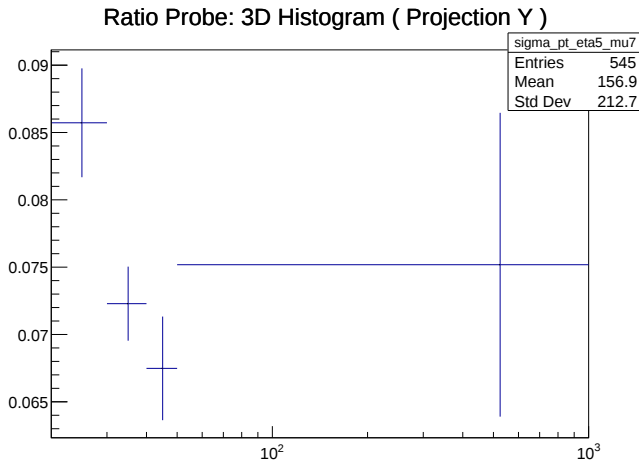


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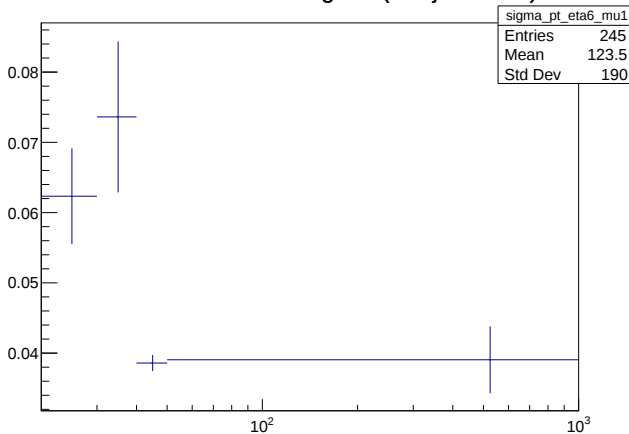


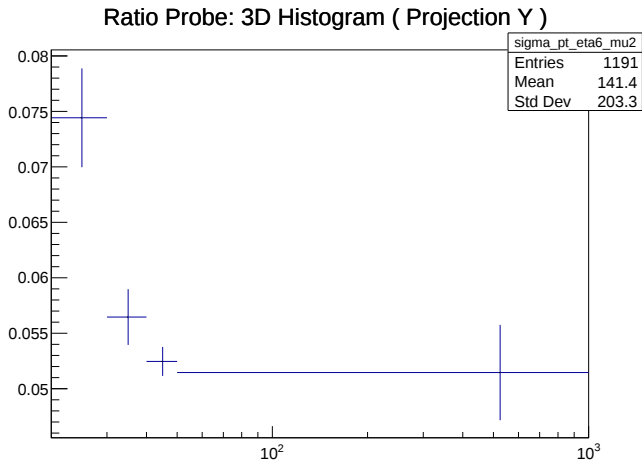
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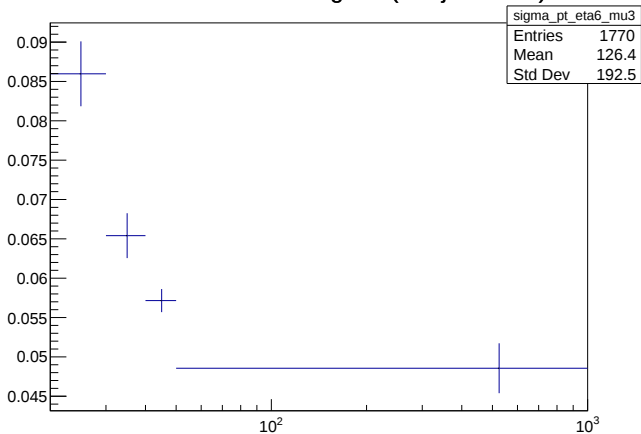


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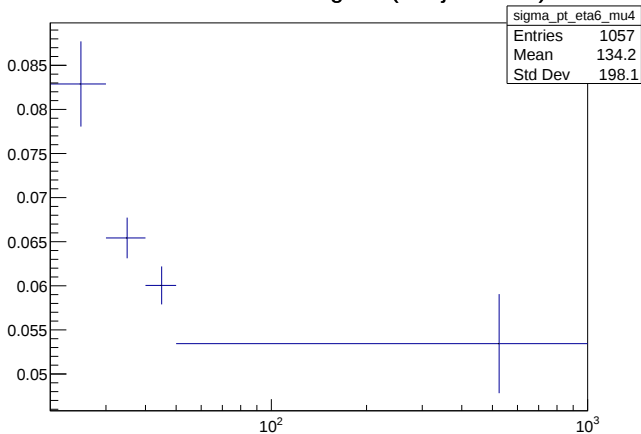




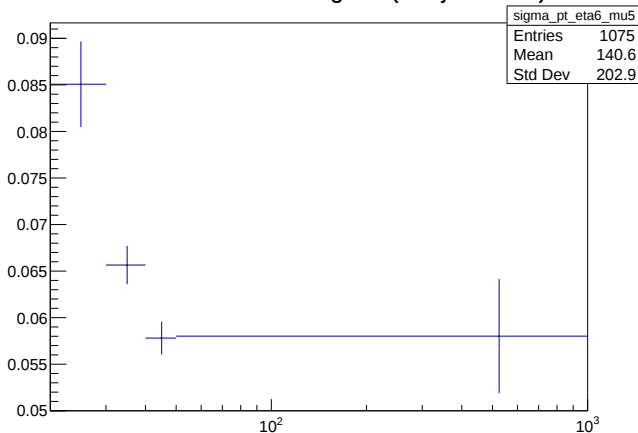
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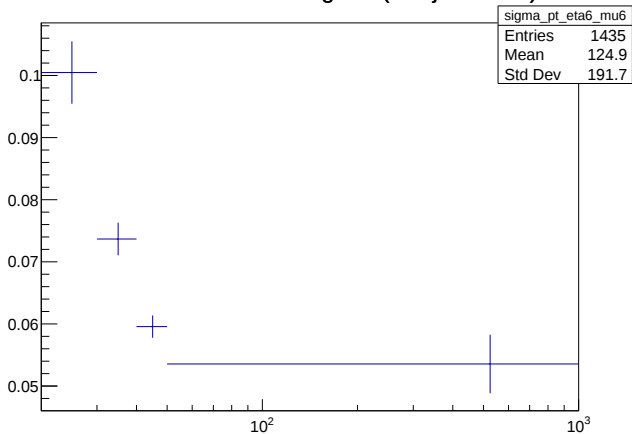
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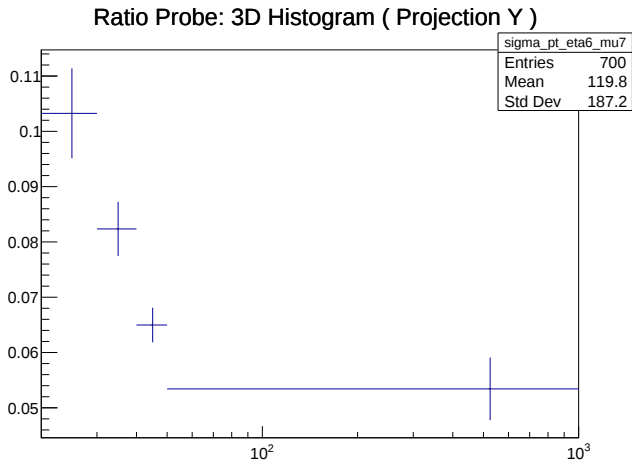


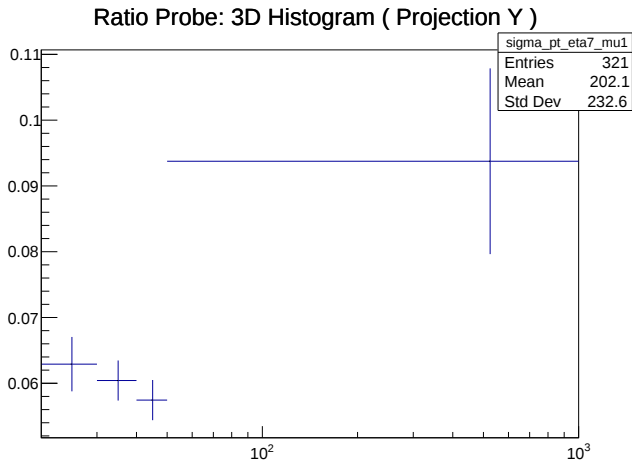
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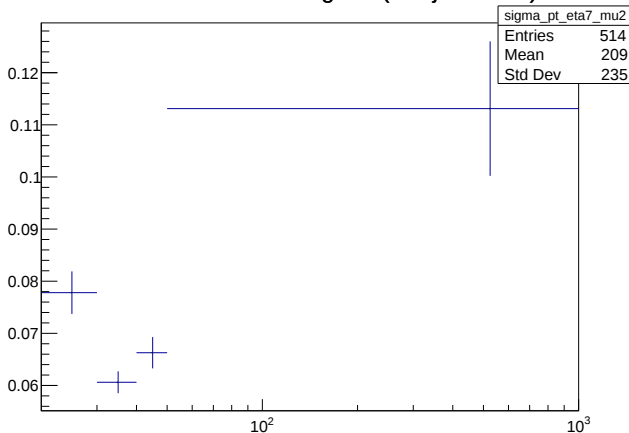
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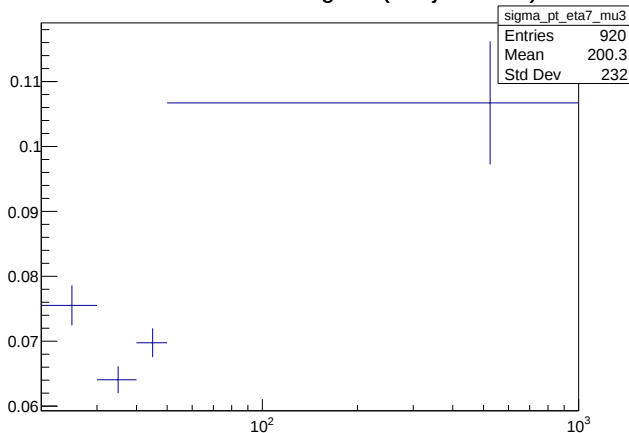


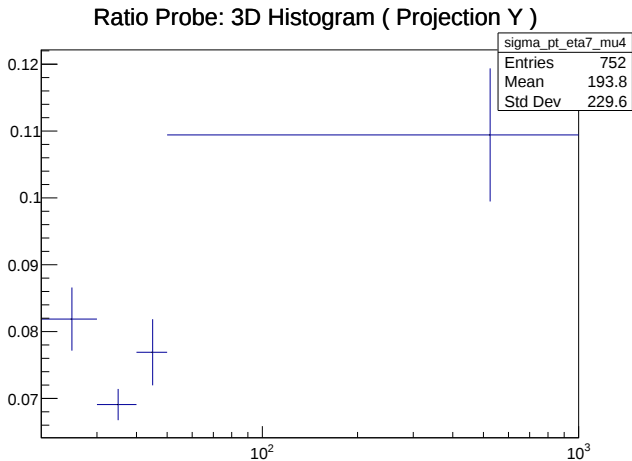


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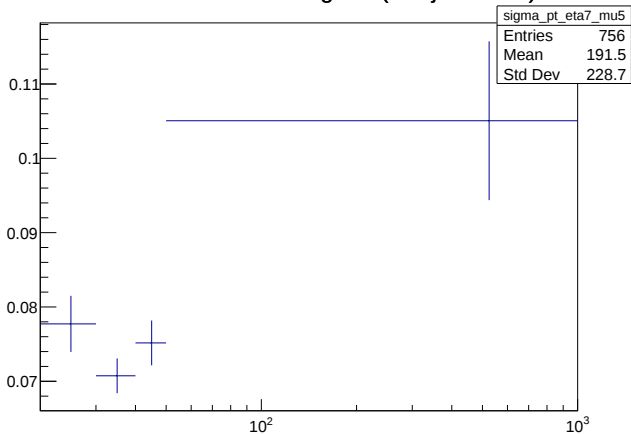


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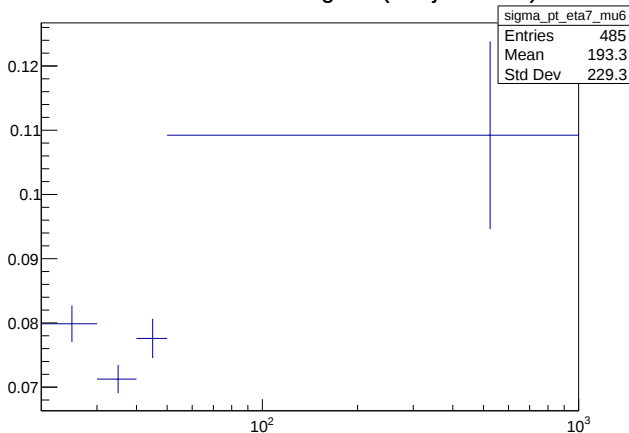




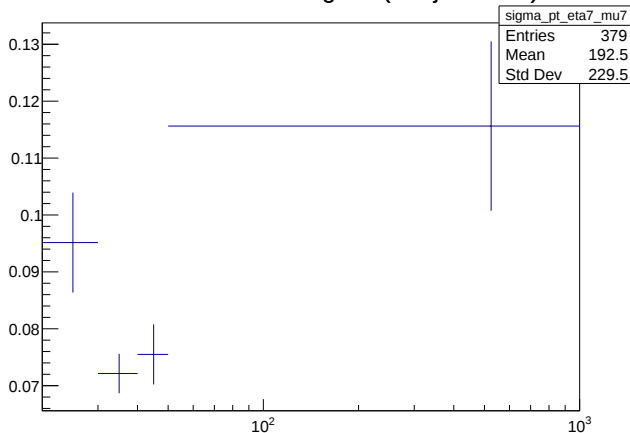
Ratio Probe: 3D Histogram (Projection Y)

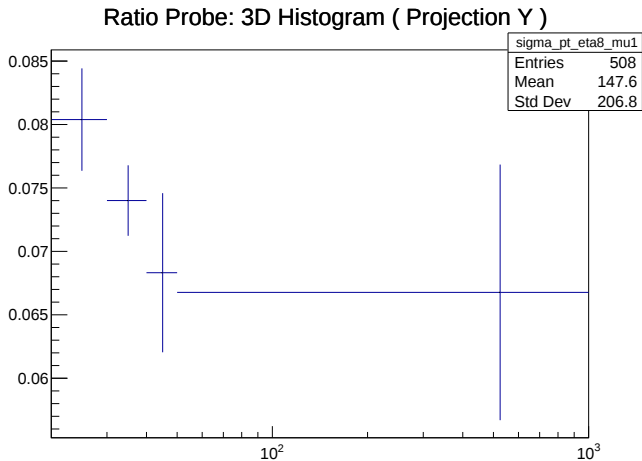


Ratio Probe: 3D Histogram (Projection Y)

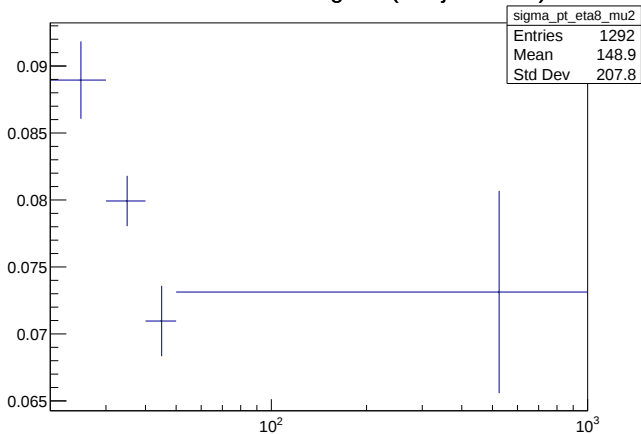


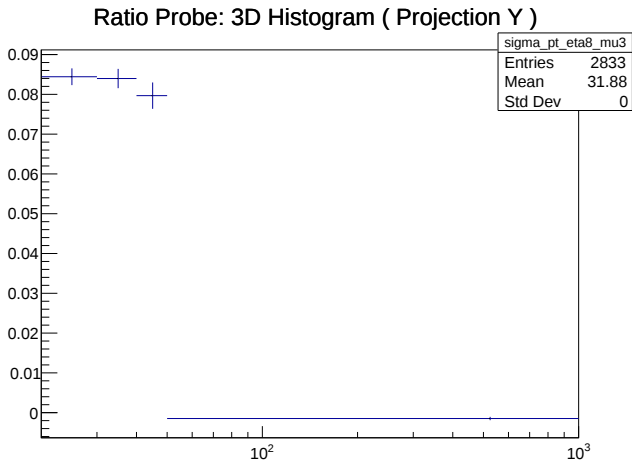
Ratio Probe: 3D Histogram (Projection Y)



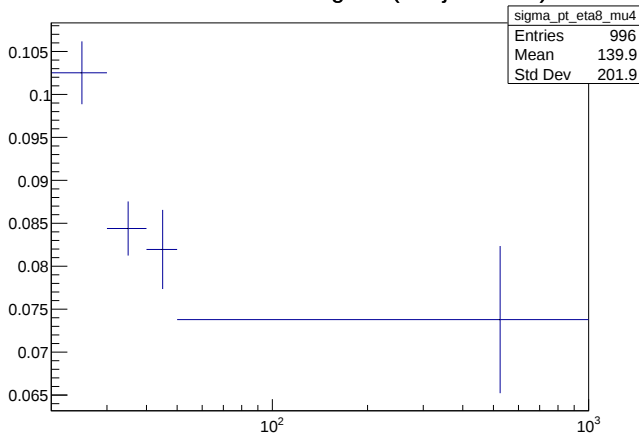


Ratio Probe: 3D Histogram (Projection Y)

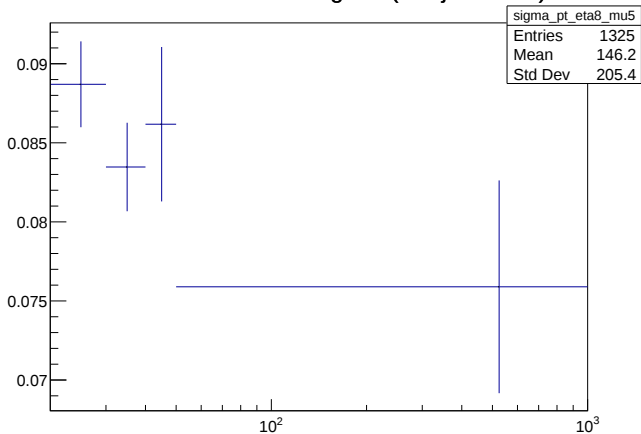


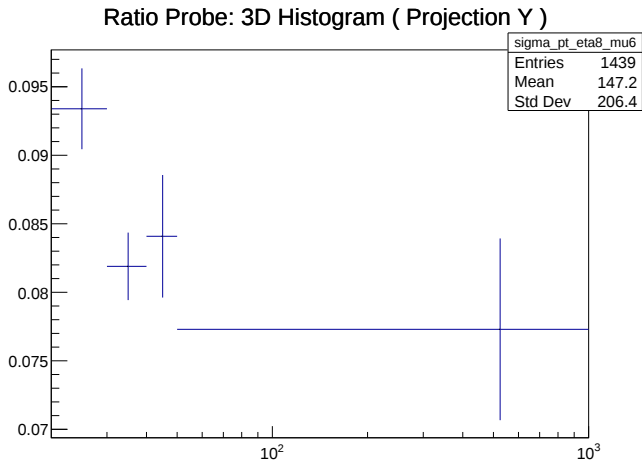


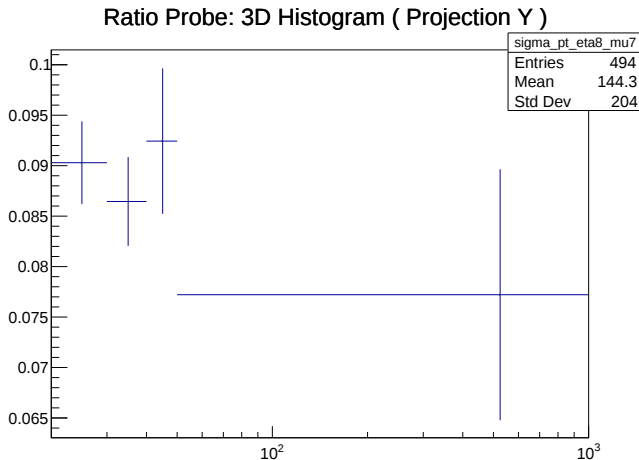
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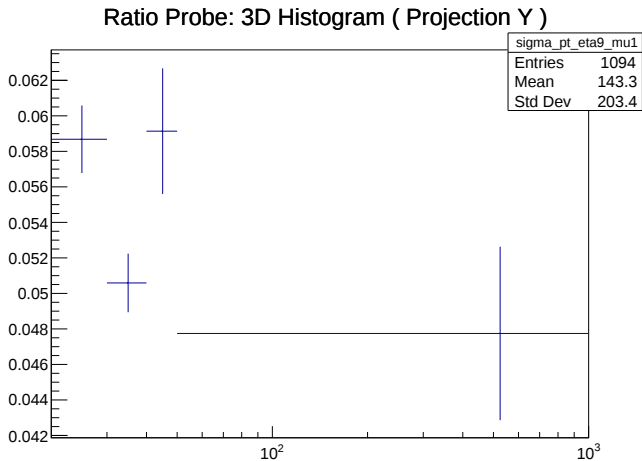


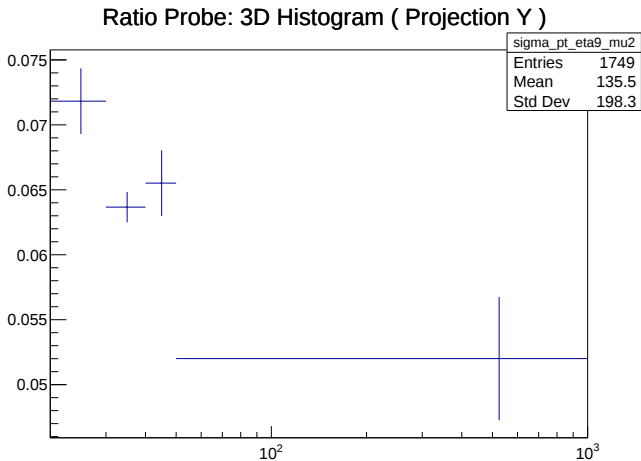
Ratio Probe: 3D Histogram (Projection Y)



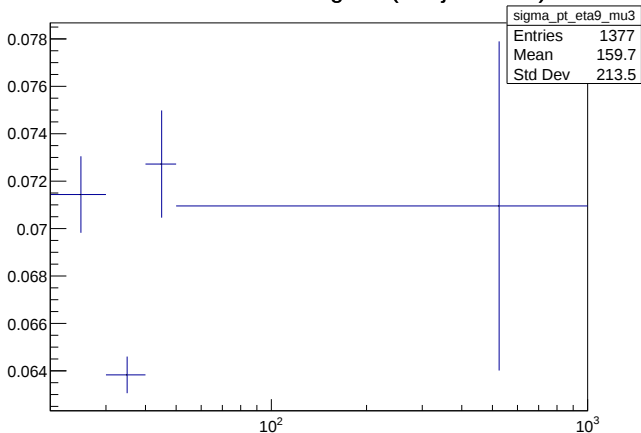


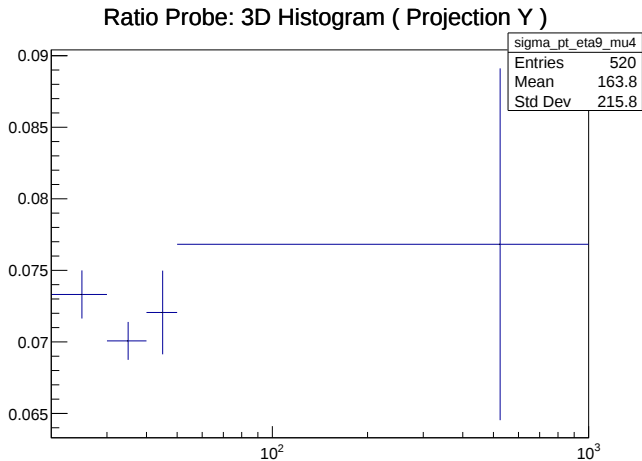


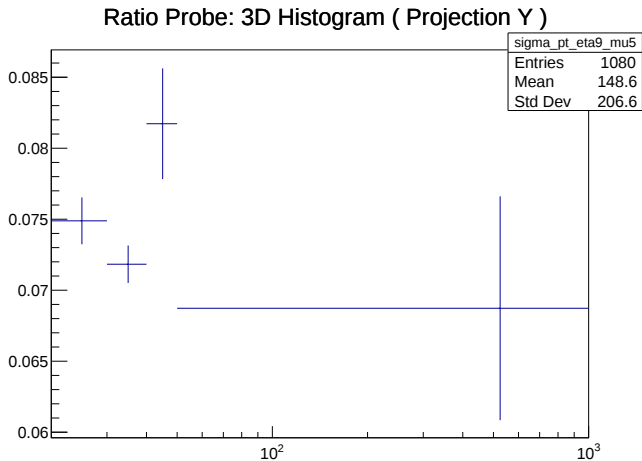


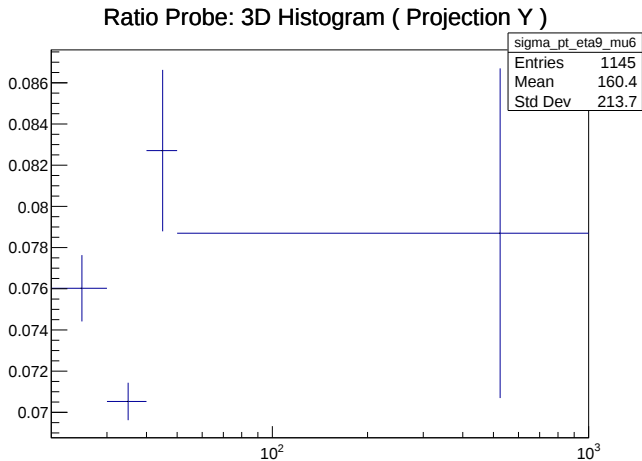


Ratio Probe: 3D Histogram (Projection Y)

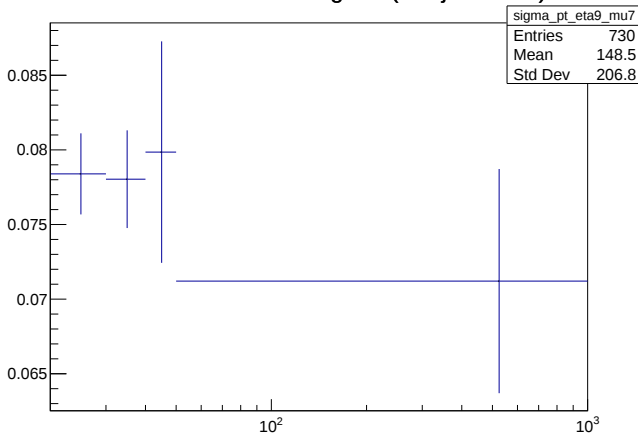




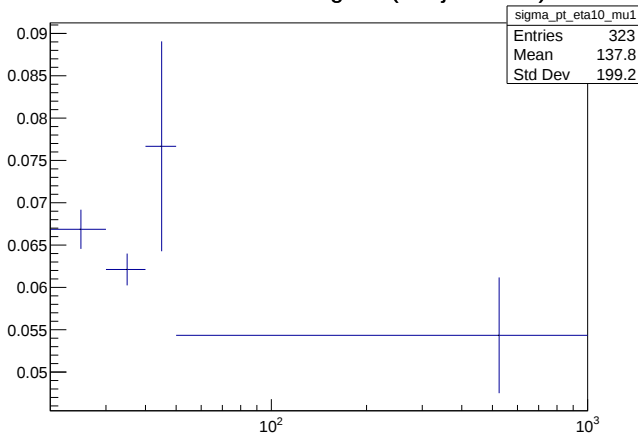




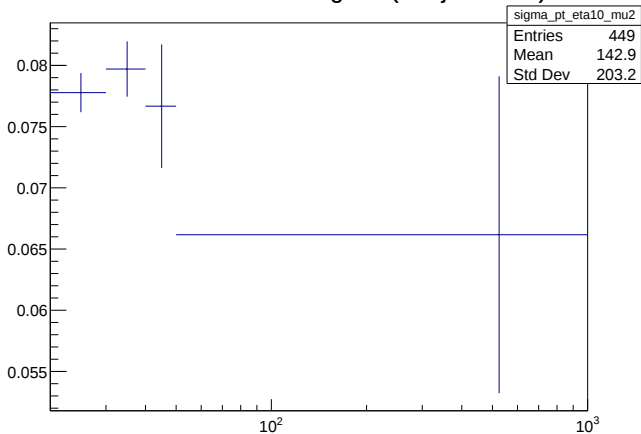
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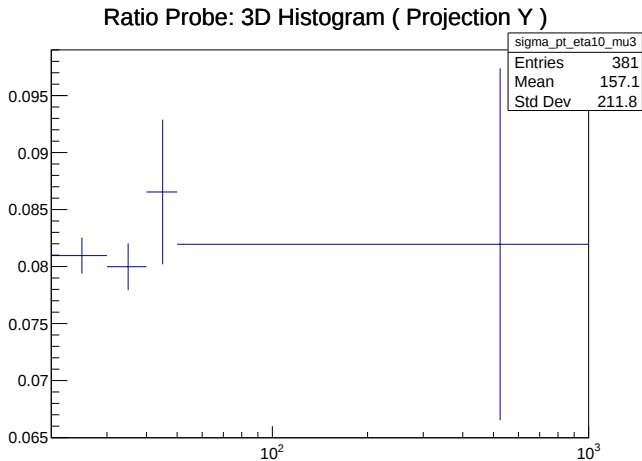


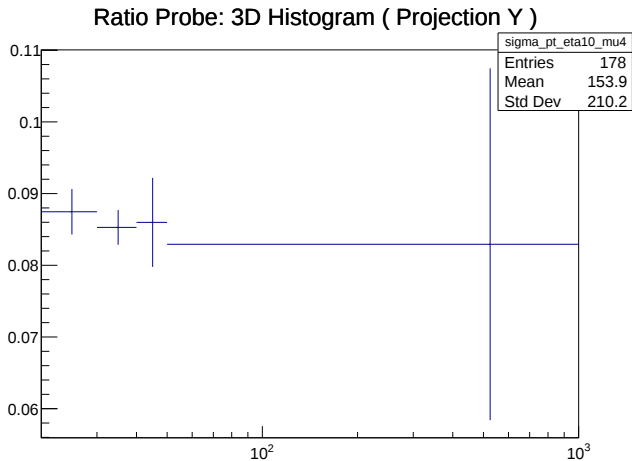
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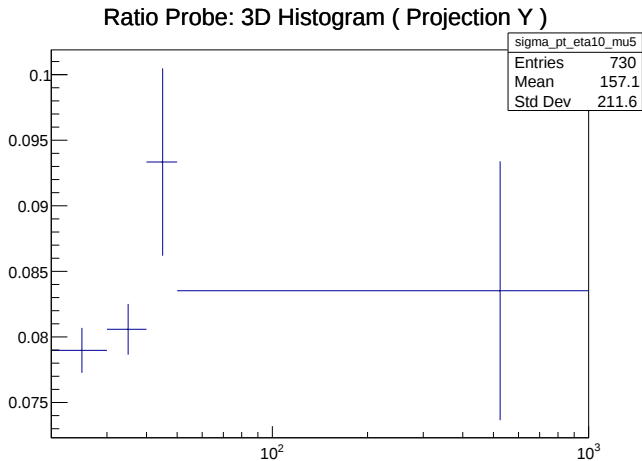


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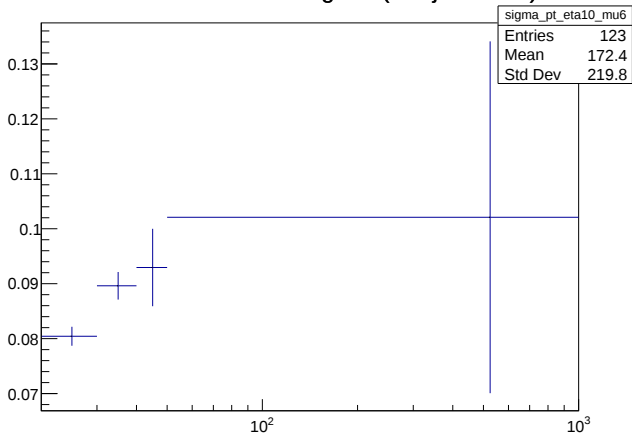




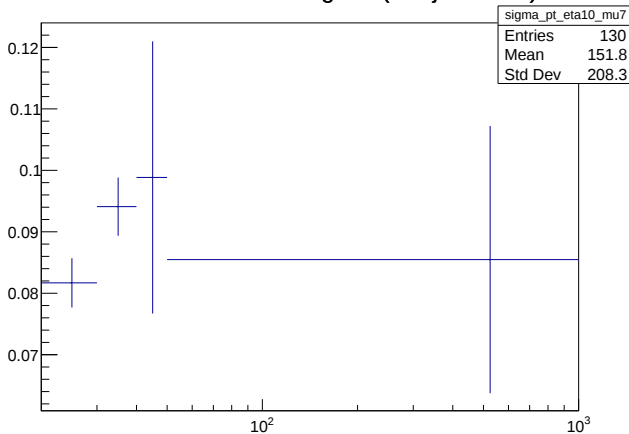


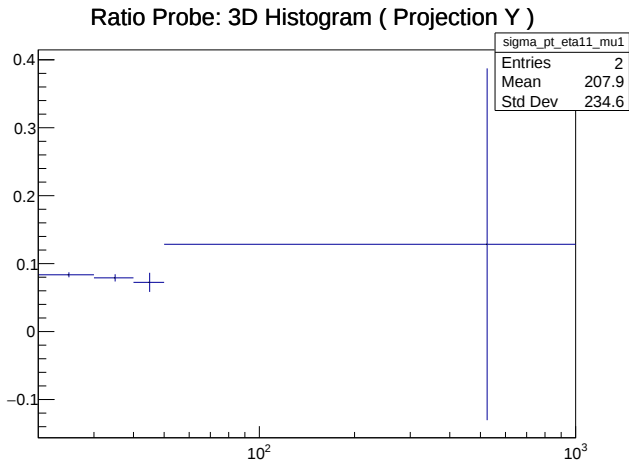


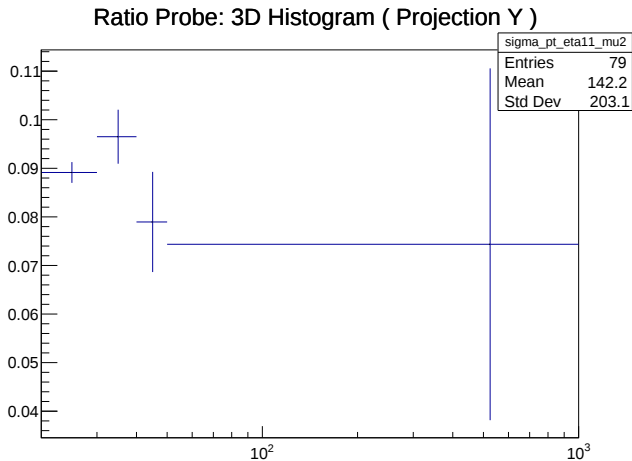
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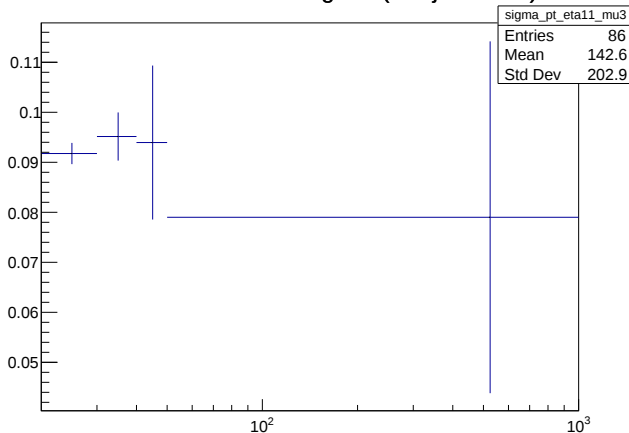
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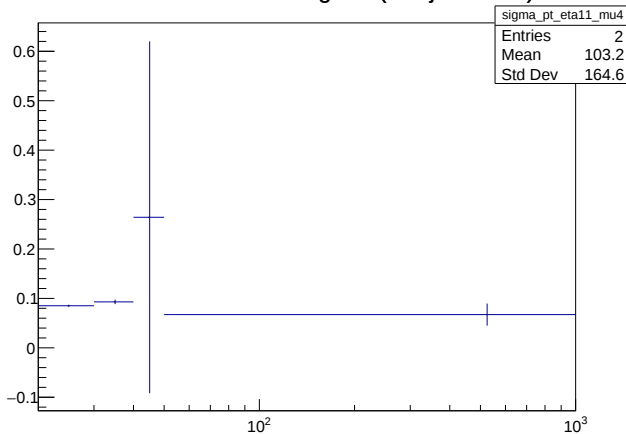


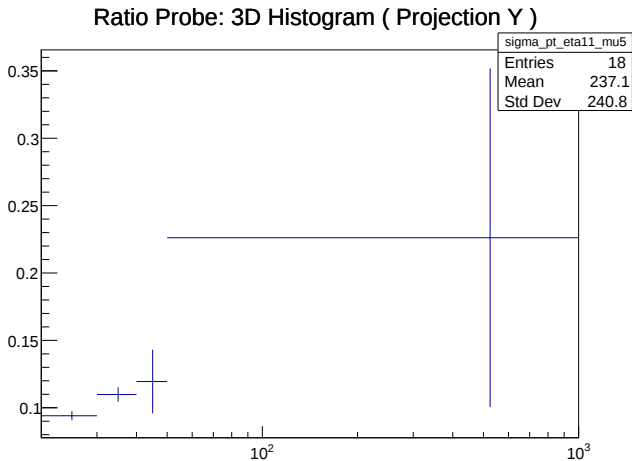


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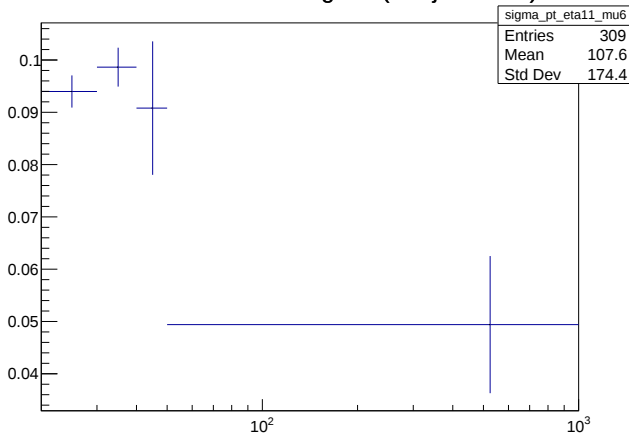


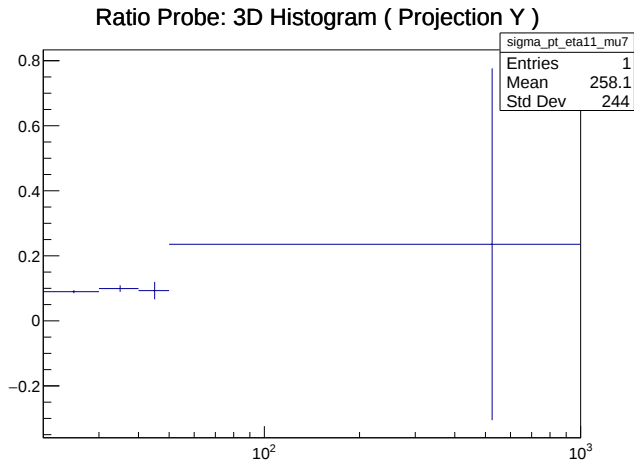
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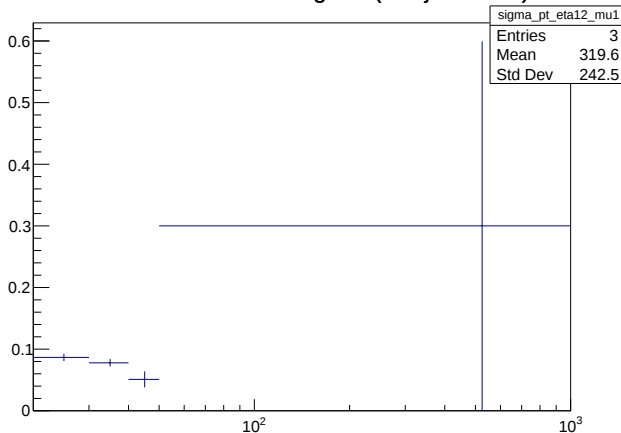


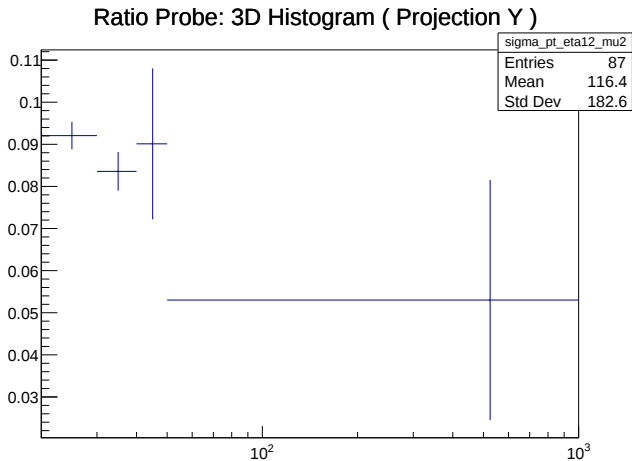
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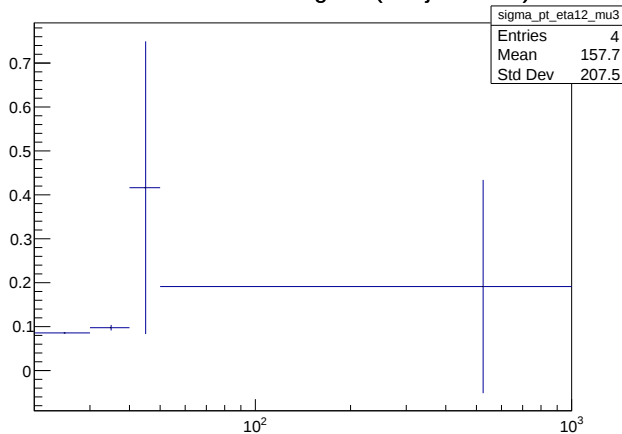


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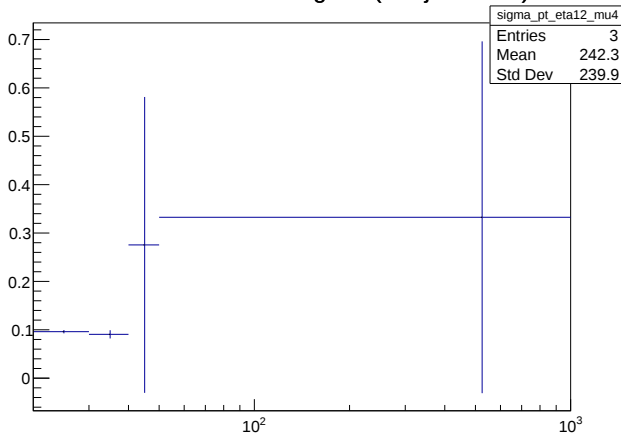




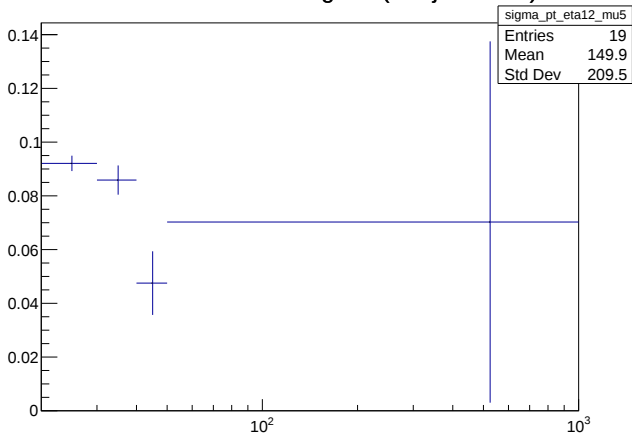
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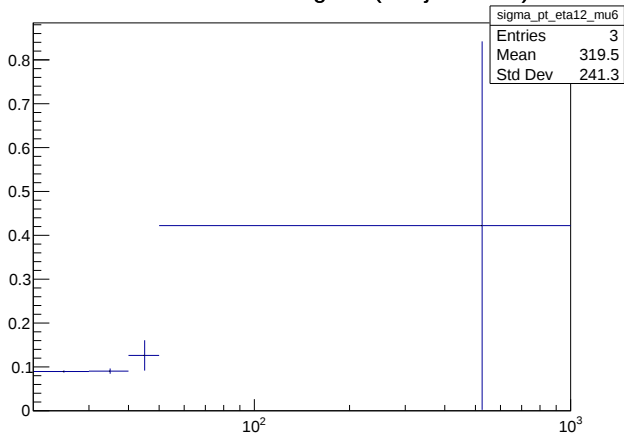
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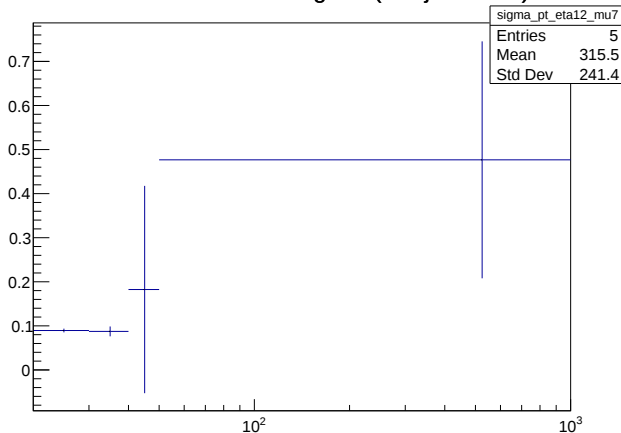
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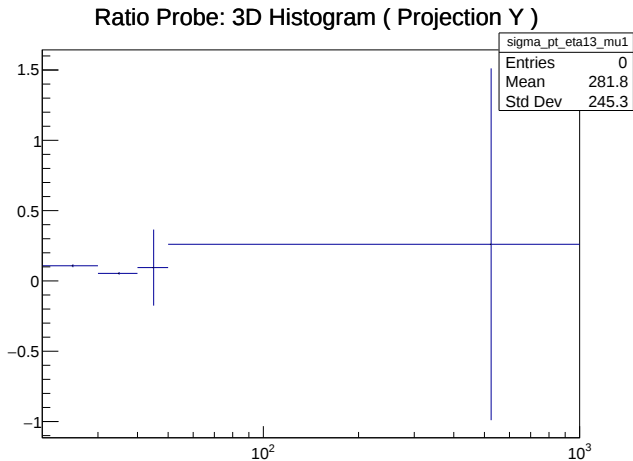


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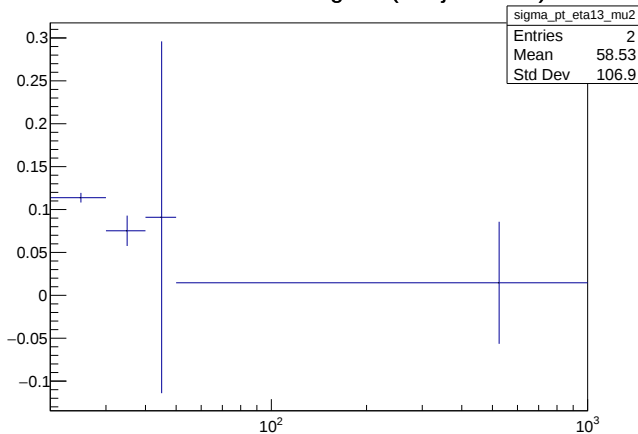


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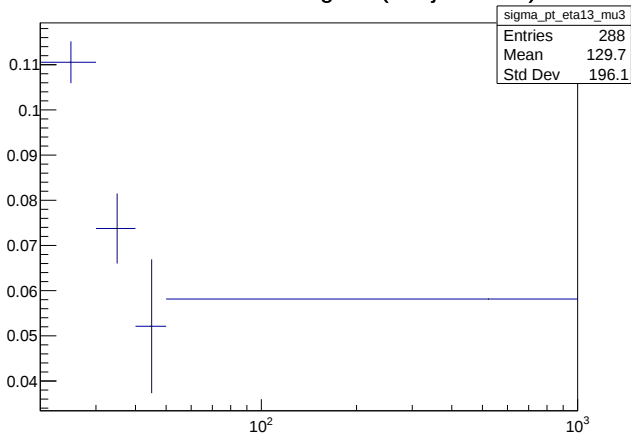


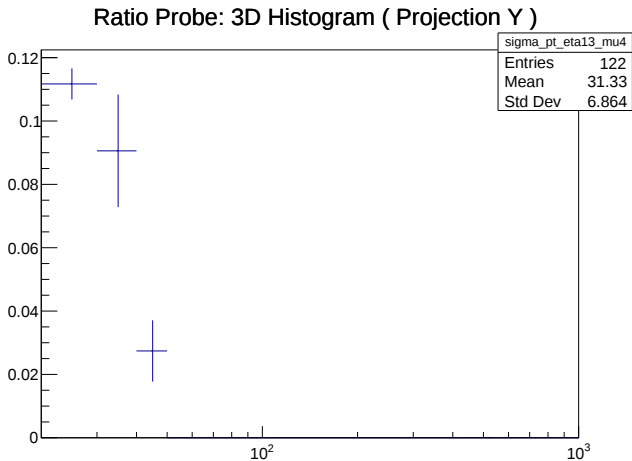


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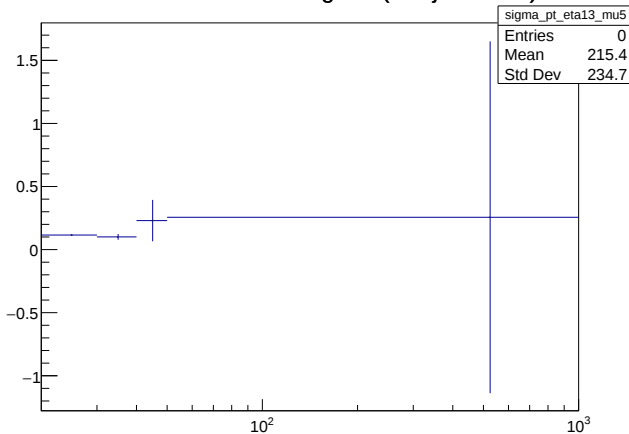


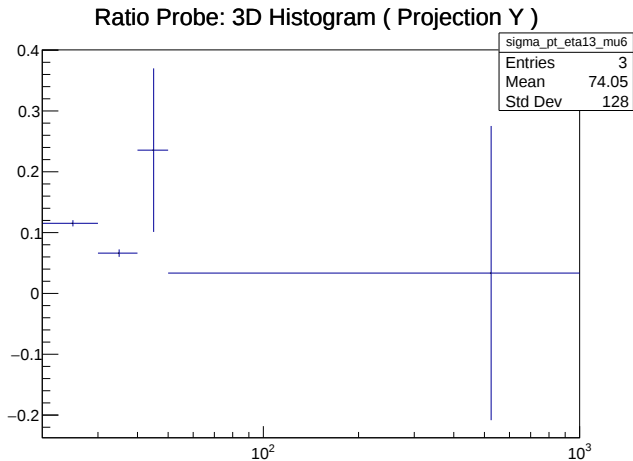
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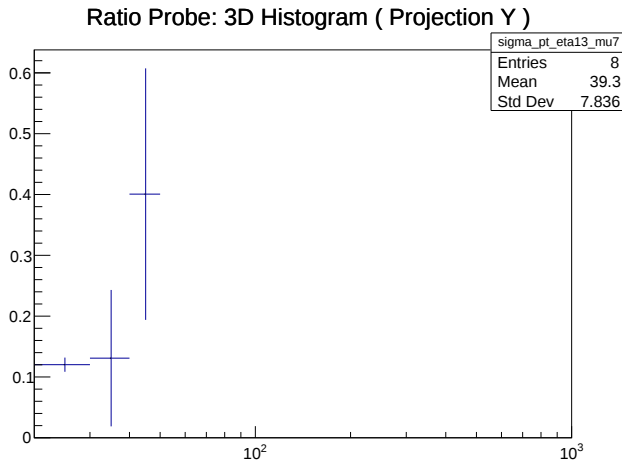




Ratio Probe: 3D Histogram (Projection Y)







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