

SciGlass: π^0 rejection

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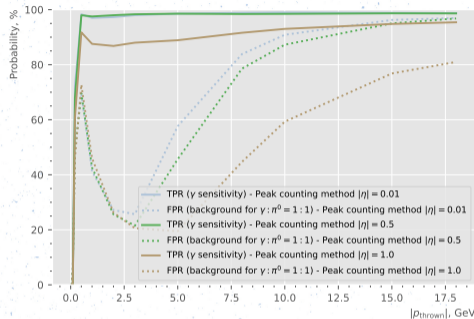
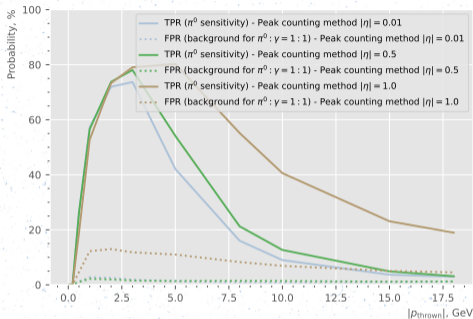
Gamma rejection → Pion rejection

- » For the Barrel Ecal review, the “positive” hypothesis was the π^0 detection
- » The goal is to present results in terms of gamma being the useful signal (sign of DVCS, with π^0 from DVMP being background)
- » In principle, when the “positive” and “negative” outcomes are swapped:

$$\text{TPR} \rightarrow 1 - \text{FPR}$$

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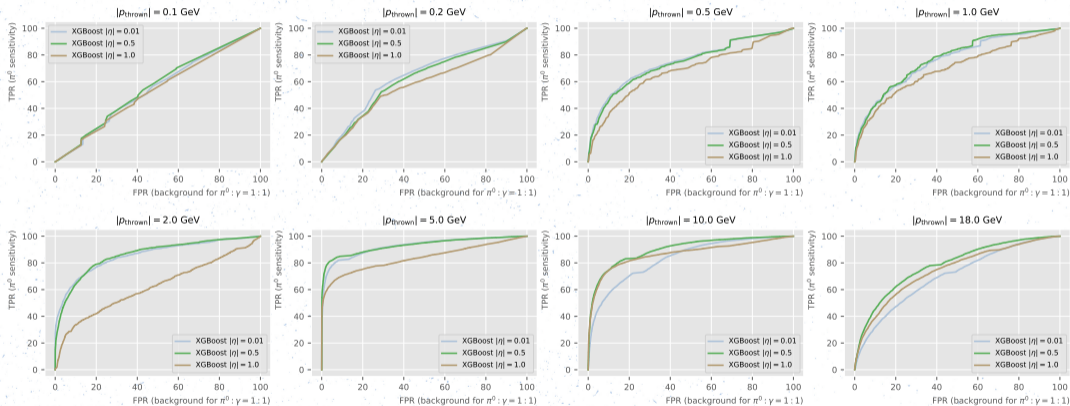
Peak counting method: Gamma rejection vs Pion rejection



- » The new pion rejection result is in agreement with the substitution rule from the last bullet on the previous slide
- » Extremely high efficiency, but also large background at high momentum

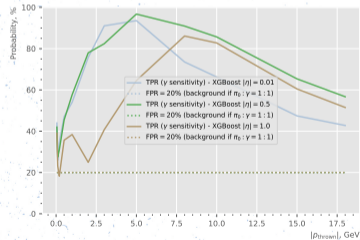
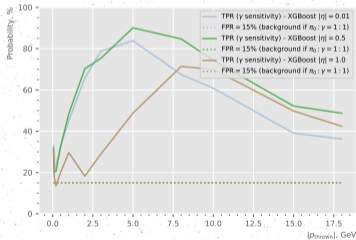
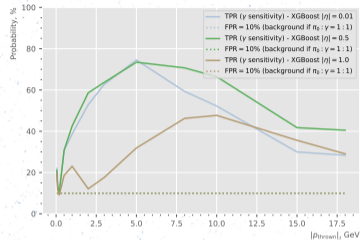
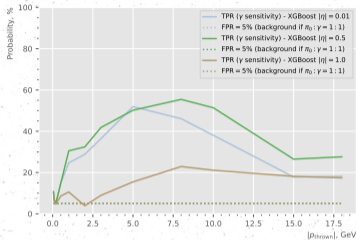
Pion/gamma separation ROC: ML method

This presents Receiver Operating Characteristic curves for ML method (right plot on slide 17):



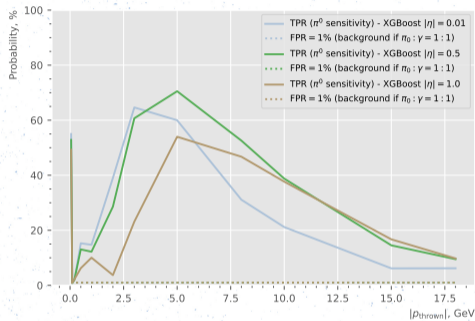
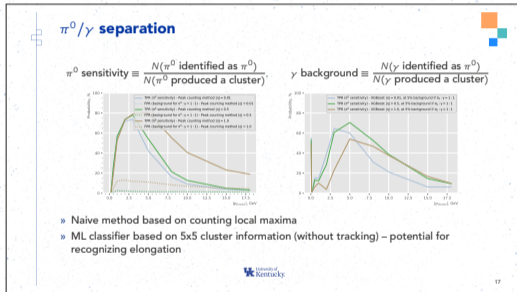
Gamma and pion rejection can be extracted for a small background values by looking at the different ends of the ROC curves. 

Gamma rejection: ML method



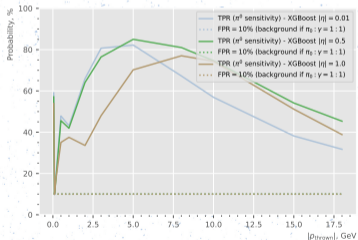
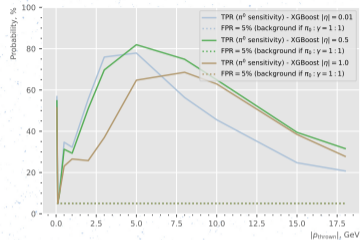
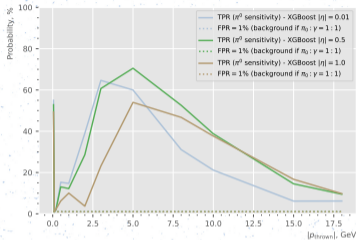
Errata

Left: the original slide, Right: the plot with corrected label



A small issue was found: the label says that 5% background was required, but the actual plot was produced at a lesser background of 1%.

Pion rejection: ML method



The 5%, 10% performances are actually way better!