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PLR WORK : 5/01/18

PLR Method

I. PDF Generator : Generates background and signal distributions
II. Sensitivity Calculator : Null hypothesis is data is composed of both background and signal events, alternative hypothesis is only background events. This part implements the PLR method to generate the significance values
III. Plot Tool: Outputs sensitivity projections

Goal: Replicate work done for LZ sensitivity. Learn how to apply to larger detectors

PLR Method
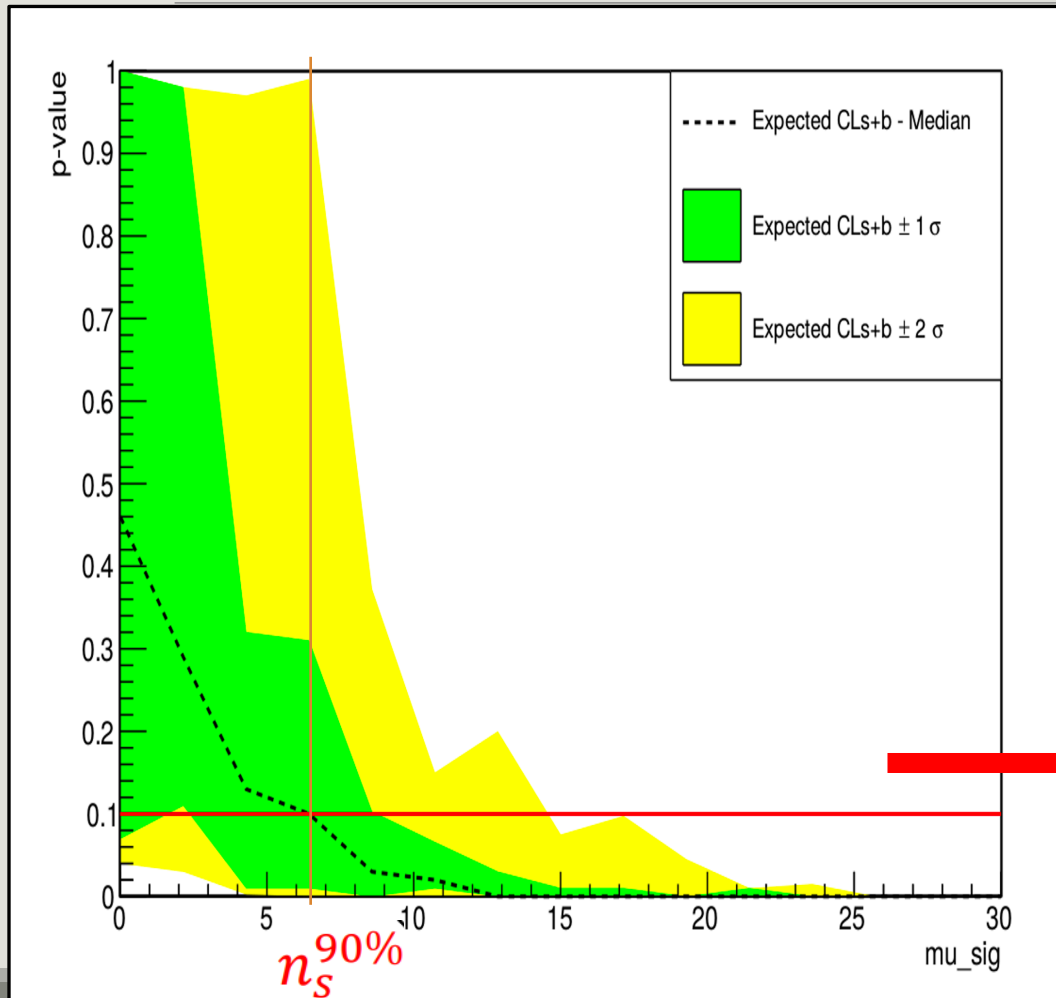
- Outputs a graph of p-value vs a parameter of interest, in our case this is counts
- Put counts into the equation below to get the upper limit on the cross section for a given wimp mass
- The left plot is done with a wimp mass of 50GeV/c^2

$$\sigma_p^{SI,90\%}[pb] = \frac{n_s^{90\%}\,[cts]}{\text{WIMP scattering rate }[cts/pb]}$$

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