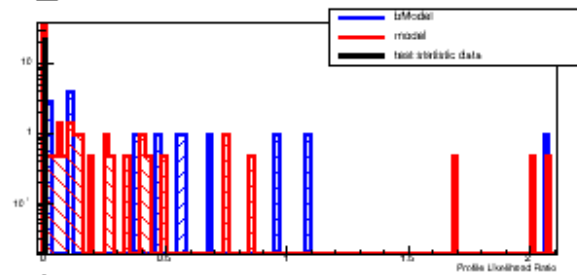# Converting PoI to coupling constant
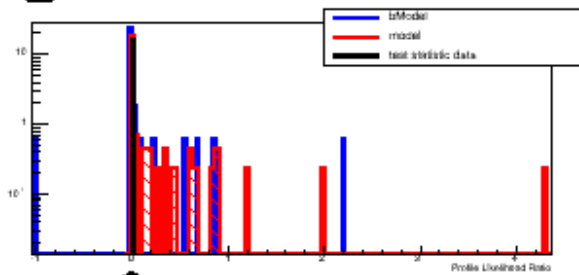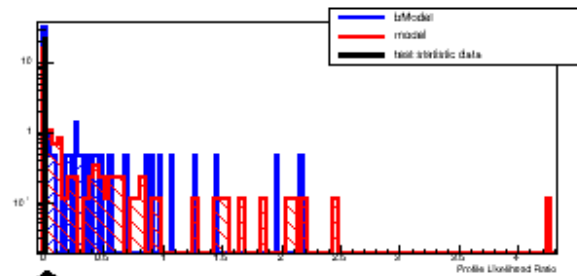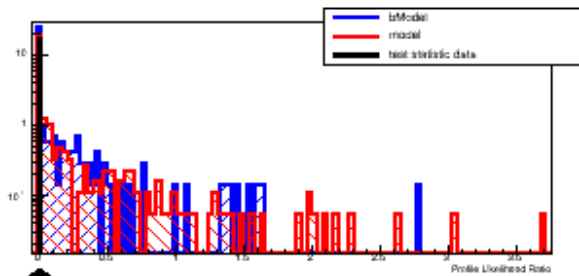
Current Dilemma

- LLR always zero
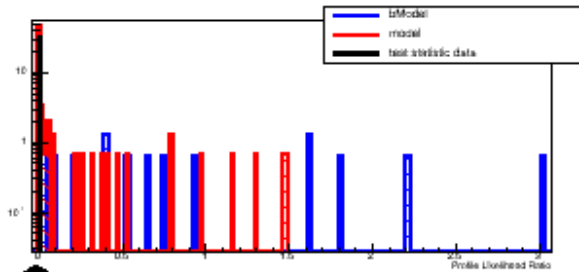
Problem:

- Number of signal events is calculated as $c_i^2 \cdot evts\_per\_ci$

- c_i is the eft coupling constant in question

- Evts_per_ci is the number of signal events expected to be seen at a c_i of 1 (c_i^2 should just scale the total number linearly given no interference terms)

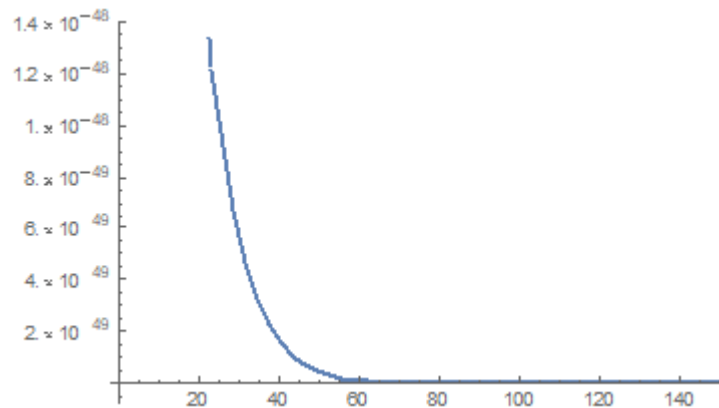- Both of these numbers are $\sim 10^{-11}$...

ci

- Based on papers of what others have found for ci it should be in this range or lower (for O1)…
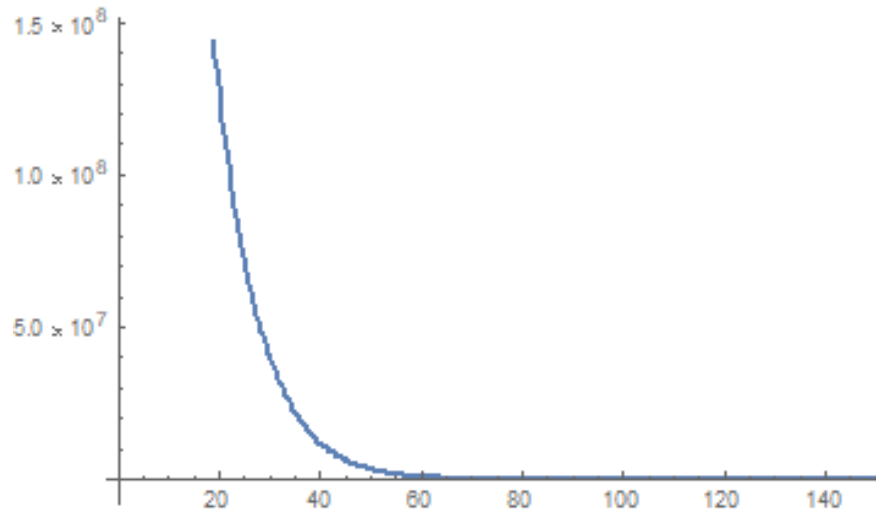

WIMP-p $\mathcal{O}_1$ interaction
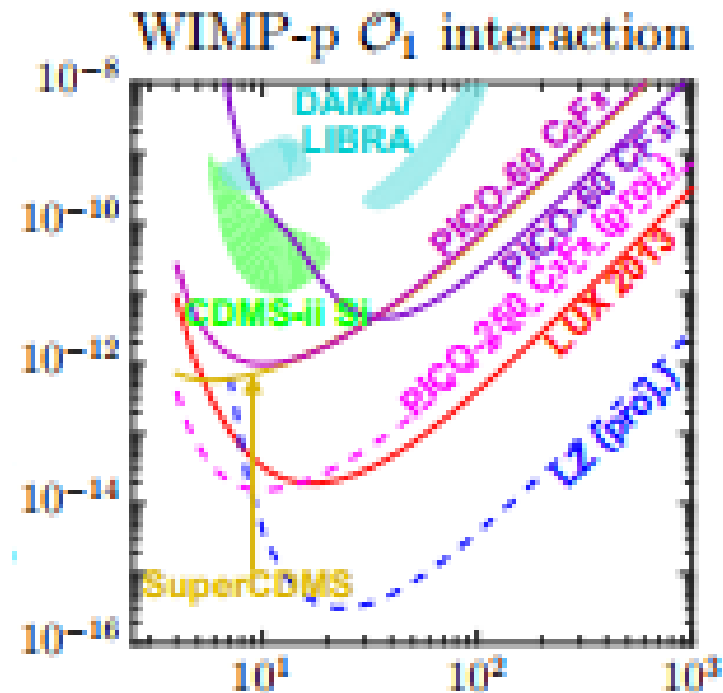
Evts_per_ci

- Mathematica with ci=1, target of 1 kg of Xe gives the following rate plot

- The units aren't specified, but I *think* they would be evts per 1kg per second.
- Integrating over the spectrum (from 1.1 keV to 50) and multplying by the exposure gives only a number of order 10^-11

Mathematica revisited

- Jun provided a script he wrote
  - Turns out I missed a line that converted from oddball units to normal (kilogramDay) units
  - After adding that some small debugging got results in an expected range.

Seems to resolve the issue