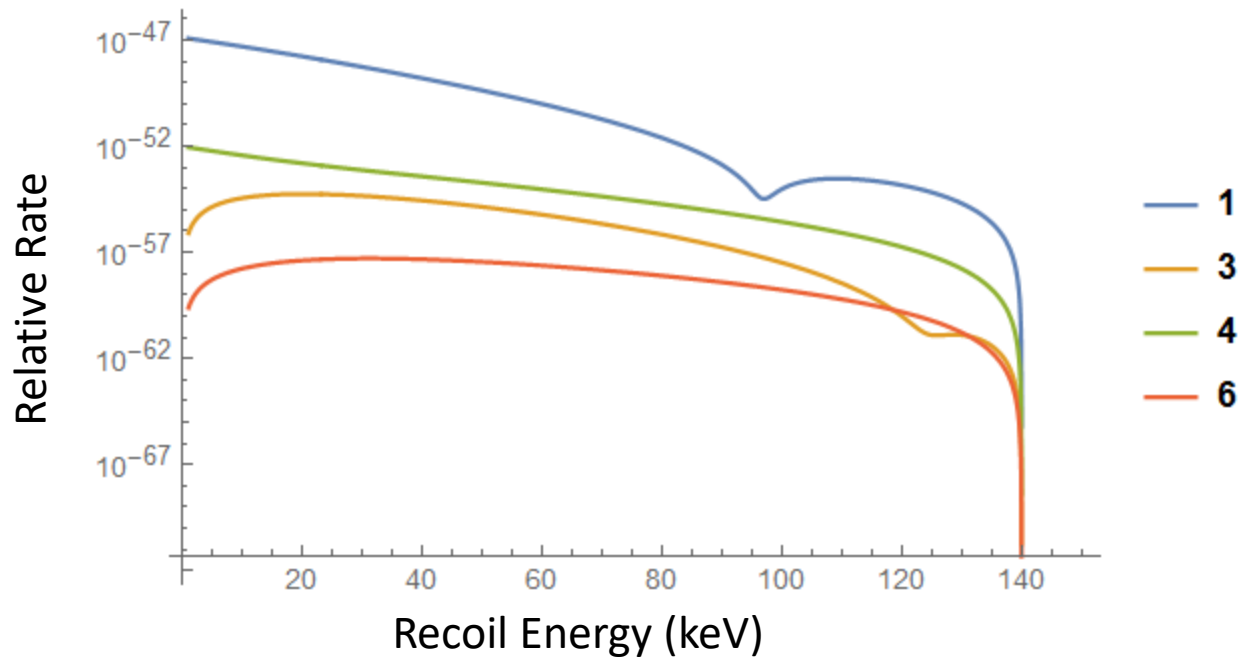# EFT Recoil Spectra

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Based on arXiv:1203.3542 (Fitzpatrick, Haxton, Katz, Lubbers, Xu)

- Anand, Fitzpatrick, Haxton wrote a mathematica package to determine rates in DM searches (arXiv:1308.6288)
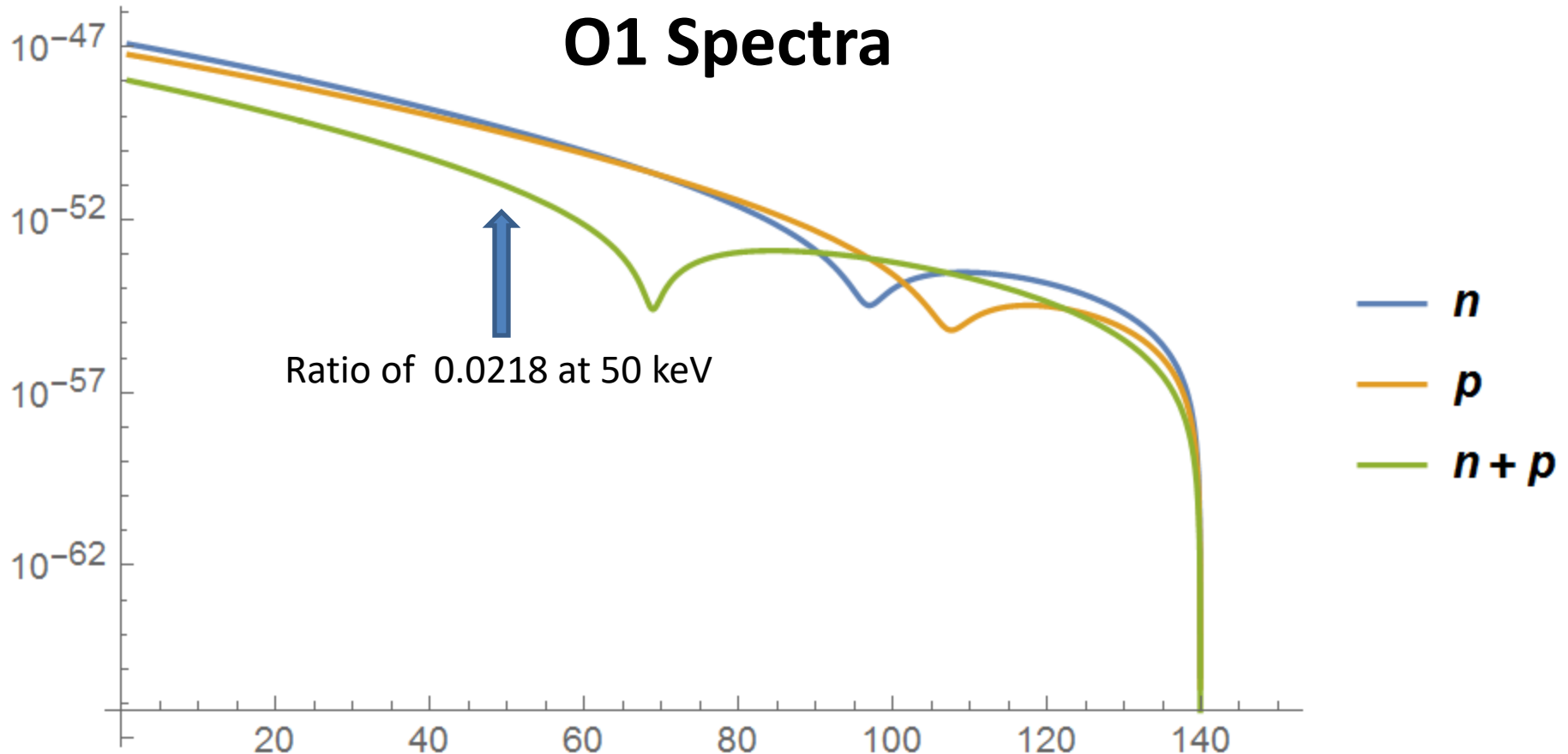- Options for DM spin, halo type, target material, etc.

Give it a try!

- compared several operators

Neutrons only, DM spin 1, Xe131 only

Seems like they all die off at 140 keV

A Few Questions…

O1 Spectra

Ratio of 0.0218 at 50 keV

Legend: n, p, $n + p$

What about neutron-proton interference? See above, for instance (C^n_1=1, C^p_1=-1)

$$\frac{dR_D}{dE_R} = N_T \frac{\rho_\chi m_T}{32\pi m_\chi^3 m_N^2} \left\langle \frac{1}{v} \sum_{ij} \sum_{a,b=0,1} c_i^{(a)} c_j^{(b)} F_{ij}^{ab}(v^2, q^2) \right\rangle$$

Questions continued…

- What spin are we assuming for DM?

- Why?

- Should we do all sorts?