# CEvNS Backgrounds

- **Problem:** CEvNS from atmospheric neutrinos present an irreducible background
  - Fortunately, they will be rare in DS-20k, but nonzero
- **People:**
  - Shawn, Matteo, Emmanuele, Ellen?
- **Procedure:**
  - The CEvNS background rate is calculable from the the neutrino flux and cross section
- **Mitigation strategy:**
  - It's irreducible, so we can't mitigate it
  - Background subtraction, PLR, and energy cuts are all possible avenues for mitigating their impact on sensitivity
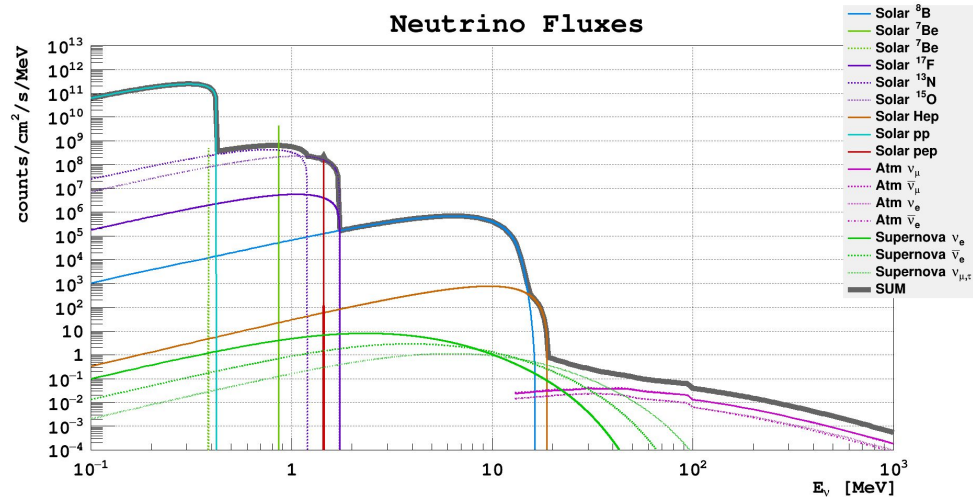
Neutrino Fluxes

Current status and results

- Above 40 keV_{nr}, we expect 17.6 events/ktonne/year
  - 1.7 events expected in 100 tonne year exposure
- Systematic uncertainty of ~20% from uncertainty on the atmospheric neutrino flux
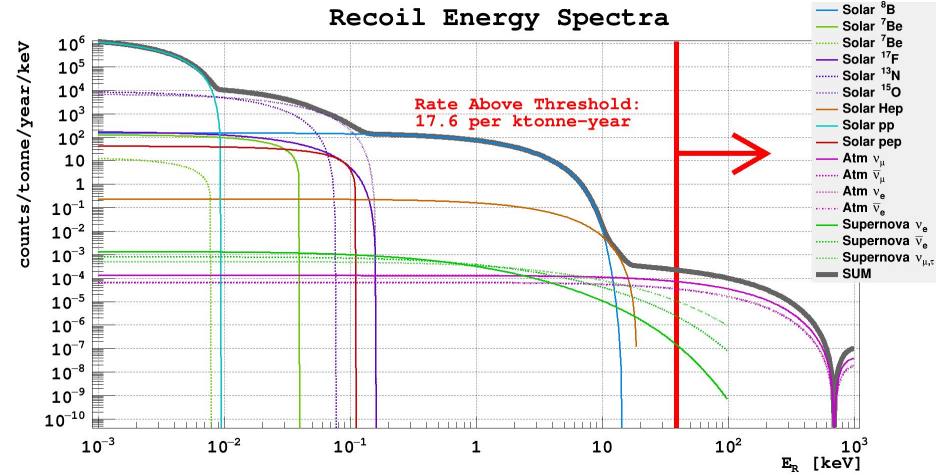
Prospects and plans

- Problems:
  - Irreducible background
- Uncertainties:
  - There's a ~20% uncertainty on the atmospheric neutrino flux
- Plans:
  - The calculation is largely done, module cross-checks
  - It's worth further developing infrastructure for studying and mitigating their impact on sensitivity, like improving PLR code, energy range of interest