Improved Limits on Cosmogenic Fluxes from Ultra-High Energy Cosmic Rays

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What is this contribution about?

We derive lower limits on the contribution of EeV cosmogenic neutrinos and γ-ray based on recent observations of ultra-high energy (UHE) cosmic rays (CRs) above 50 EeV.

Why is it relevant / interesting?

Cosmogenic neutrinos and γ-rays are one of the targets of next-generation neutrino and/or cosmic ray experiments. Their observations allows us to test UHE CR models, in particular their mass composition at energies above the GZK cutoff.

What have we done?

We fit the UHE CR *nucleon* emission spectrum above 50 EeV using Monte Carlo simulations by CRPROPA for two conservative choices of source redshift evolution.

What is the result?

We show that next-generation neutrino observatories are capable of observing EeV cosmogenic neutrino fluxes if the *observed* CR proton contribution is above 2-10%, depending on source evolution. If the observed UHE CR spectrum above 50 EeV is dominated by heavier nuclei with mass number $A_{\rm o}$, our lower limits scale as $A_{\rm o}^{-3.2}$.

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