



Contribution ID: 45

Type: **Parallel talk**

## Signature of Collapsars as Sources for High-energy Neutrinos and r-process Nuclei

*Tuesday, 4 July 2023 14:50 (25 minutes)*

If collapsars are sources for both high-energy (HE) neutrinos and r-process nuclei, the profuse low-energy antineutrinos from beta-decay of the newly synthesized nuclei can annihilate the HE neutrinos. Considering HE neutrinos produced at internal shocks induced by intermittent mildly-magnetized jets, we show that such annihilation suppresses the overall HE neutrino spectrum above 300 TeV and produces a corresponding flavor composition of (1:10:1) at source. We find that the emergent HE neutrino flux can well fit the diffuse flux observed at IceCube if contributions from all similar sources are taken into account. Our results highlight the unique role of HE neutrinos in supporting collapsars as sources for r-process nuclei, and can be tested by accurate measurement of the diffuse HE neutrino flux spectrum and flavor composition, as well as detection of HE neutrinos from individual sources.

**Primary author:** GUO, Gang (China University of Geosciences (Wuhan))

**Co-authors:** QIAN, Yong-Zhong; WU, Meng-Ru

**Presenter:** GUO, Gang (China University of Geosciences (Wuhan))

**Session Classification:** Parallel talks 1: Astro-particle Physics & Cosmology