Contribution ID: **115** Type: **Poster**

Diagnosing the origin of dense circumstellar material in a multi-energy neutrino astronomical approach

Wednesday 27 August 2025 18:00 (2 hours)

We propose a novel approach to investigate the mysterious origin of enhanced circumstellar material (CSM) surrounding a collapsing massive star using neutrinos. Here, non-thermal TeV neutrinos produced from ejecta–CSM interactions and thermal MeV neutrinos from a pre-explosion burning process are related under the assumption that CSM had been created through the pre-supernova neutrino release. Our idea initiates astrophysical studies utilizing neutrinos from multiple energy regimes. In this presentation, we show the calculated spectrum and light curve of high-energy neutrinos derived from a representative pre-supernova model as well as the detected event rates along time at JUNO and IceCube. In addition, we discuss the application range of the proposed method.

Collaboration you are representing

Author: ASHIDA, Yosuke (Tohoku University)

Co-author: SAWADA, Ryo (ICRR, University of Tokyo)

Presenter: ASHIDA, Yosuke (Tohoku University)

Session Classification: Poster session

Track Classification: Neutrino Physics and Astrophysics