



Contribution ID: 11

Type: **not specified**

## Simulations of Semi-Leaded Neutron Monitor Response Functions from Latitude Surveys

*Wednesday, 20 September 2023 09:00 (30 minutes)*

This study focuses on neutron monitors (NMs), which are detectors used to measure the flux of high-energy cosmic ray neutrons. The standard NM64 design consists of a reflector, lead rings, a moderator, and a proportional counter filled with boron-10 gas. NMs play a crucial role in studying cosmic rays, their impact on Earth's atmosphere, and space weather. The Changvan neutron monitor undertook round trips between Shanghai and Antarctica, known as a latitude survey. Changvan used a modified design referred to as a "semi-leaded neutron monitor," with three counters following the NM64 design, but the middle counter lacked lead ring producers. Latitude surveys determine the energy-dependent effective area (yield function) at sea level based on response functions. Monte Carlo simulations were performed to investigate the response functions utilizing atmospheric models of Hobart, Shanghai, and Zhongshan. The primary objective of this study was to compare the Monte Carlo simulations of different atmospheric profiles. This work was supported by NARIT, Chiang Mai University (CMU), and by the NSRF via the Program Management Unit for Human Resources & Institutional Development, Research and Innovation (B39G660028).

**Primary authors:** Dr SERIPIENLERT, Achara (National Astronomical Research Institute of Thailand (NARIT), Chiang Mai 50180, Thailand); Dr NUNTIYAKUL, Waraporn (Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai 50200, Thailand)

**Presenter:** Dr SERIPIENLERT, Achara (National Astronomical Research Institute of Thailand (NARIT), Chiang Mai 50180, Thailand)

**Session Classification:** Neutron Monitors