Contribution ID: **36** Type: **not specified**

Progress of Giant Radio Array for Neutrino Detection (GRAND)

Monday, 11 November 2024 15:00 (30 minutes)

Ultra-high-energy cosmic rays (UHECRs) remain one of astrophysics' greatest mysteries. Observing ultra-high-energy (UHE) neutrinos offers a unique means of tracing these high-energy particles to their distant sources, as neutrinos can travel across the universe largely unimpeded, even beyond the Greisen-Zatsepin-Kuzmin (GZK) horizon.

The Giant Radio Array for Neutrino Detection (GRAND) is a proposed large-scale observatory aimed at detecting UHE neutrinos and cosmic rays through a dual approach: collecting unprecedented UHECR data while simultaneously searching for UHE gamma rays and neutrinos. GRAND is envisioned to deploy 200,000 radio antennas across 200,000 km² in roughly 20 sub-arrays of 10,000 km² each, targeting a neutrino sensitivity of approximately 10ˆ −10 [GeV cmˆ −2 sˆ −1 srˆ −1] for energies above 5 * 10ˆ17 [eV], with sub-degree angular resolution.

GRANDProto300, a 300-antenna prototype array, is currently under construction in Xiao Dushan, Gansu province, China, with data collection anticipated in 2024. Its objectives include autonomous radio detection of inclined air showers and probing the cosmic ray energy spectrum around the Galactic-extragalactic transition. In the first stage, an 80-antenna array will be operational. We will present the preliminary designs, simulated performance projections for GRAND, and early results from GRANDProto300.

Primary author: 张, 克文

Presenter: 张, 克文

Session Classification: Neutrino astronomy (MeV –EeV)