

Horizontal air showers and neutrino search with LHAASO-KM2A

Friday, 29 October 2021 11:10 (20 minutes)

High-energy transients, e.g., gamma-ray bursts (GRBs), supernovae, and blazars, are potential sources of high-energy cosmic rays. Neutrinos are a good probe of the origin of cosmic rays.

Horizontal air showers (HAS) are expected to be initiated by deeply penetrating high energy particles such as neutrinos. Indeed, at large zenith angles the electromagnetic component of ordinary air showers should be attenuated by the atmosphere well before reaching the ground level and the muon component is expected to dominate the secondary particles. Neutrino candidate events, on the contrary, are expected to be like the electromagnetic showers, with a small muon content. Measuring the muon content provides a method to discriminate between showers, then to tag neutrino candidate events.

The LHAASO-KM2A is constituted by a large array of both electromagnetic and underground muon detectors, with unprecedented total sensitive area (greater than 40,000 m²).

In this talk I show the first results of HAS with the half array of LHAASO-KM2A, including the zenith angle distribution of extensive air showers and the transition from electromagnetic-dominated showers to muon-dominated ones above a zenith angle of 60 deg.

Primary author: Dr GOU, Quanbu (Institute of High Energy Physics, CAS)

Presenter: Dr GOU, Quanbu (Institute of High Energy Physics, CAS)

Session Classification: Session 1