Contribution ID: **881** Type: **Poster**

Reconstruction the production depth of muon in air shower

Friday 16 July 2021 19:18 (12 minutes)

One possible way to determine the mass of cosmic rays is to study the longitudinal development of the air shower. The depth of the muon production maximum is sensitive to the nature of the primary particles and also helps to provide insight on whether new physics phenomena take place. The muon detectors of KM2A in Large High Attitude Air Shower Observation (LHAASO) record hitting time and number of muons which reach the ground. The arrival times of the muons allow the reconstruction of their geometrical production heights along the shower axis. The air shower is simulated using CORSIKA with QGSJETII-04 and EPOS-LHC models for the energy of shower about 10 PeV and zenith about 45°, KM2A detectors is simulated with GEANT4. The time decay due to kinematic effect and muon production are studied by tracking the muon in CORSIKA. The distance of muon to the shower core is optimized in order to keep the geometry time delay is the dominant factors. Using the KM2A simulation data, the muon production depth in the air shower is reconstructed according the geometry effect. The reconstructed depth will compare with the production depth of muon in CORSIKA to validate the reconstruction method.

Keywords

Muon production depth

Collaboration

other Collaboration

Subcategory

Experimental Methods & Instrumentation

Primary author: Ms WANG, liping (SDU)

Co-authors: MA, lingling (IHEP); FENG, cunfeng (SDU)

Presenter: Ms WANG, liping (SDU)

Session Classification: Discussion

Track Classification: Scientific Field: CRI | Cosmic Ray Indirect