

Cosmic Ray Knee Measurements with LHAASO

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LHAASO as a complex of detector arrays has been built and operated for cosmic ray (CR) measurements in the energy range from 100 TeV to 100 PeV. The goals are measuring knees of individual species such as protons, helium and iron nuclei. Two key issues are the energy scale determination and separation of specific species from others in the air shower detection. Using the moon shadow in galactic CRs as a negative beam of charged particles that are deflected in geo-magnetic field, we have measured the energy scale at 21 TeV, the highest energy scale of CR measurements ever reached. We have studied multiple variables of air showers that characterize the development of cascades of particles in the atmosphere, such as the atmospheric depth of shower maximum using Cherenkov telescopes, muon content of showers and some lateral distribution parameters using ground arrays of detectors, thus, we develop the primary CR identification based on a multi-variable-analysis procedure. Some preliminary results are presented in this talk together with the status of the LHAASO experiment in the CR detection.

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