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Cosmic ray data and their interpretation: the Tibet hybrid EAS experiment – Primary energy spectra of Cosmic Rays at the knee and tests of hadronic interaction models –

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The Tibet hybrid air shower experiment is composed by an air-shower core detector array and the air-shower array (and a large muon detector from October, 2010), that has been operated at Yangbajing (4300 m above sea level) in Tibet, China, since 1996. This multi-detector system is used for the search for high energy celestial gamma-ray and cosmic ray sources, and for the study of the chemical composition as well as the energy spectra of nuclear-components in the knee region. Both are aimed to investigate the origin of high energy cosmic rays through different approaches. In this talk, based on the chemical composition and the energy spectra of some individual nuclear components around the knee, we would like to discuss the sharp knee observed by our experiment and its relation with the contribution of possibly existing nearby source(s). We would also discuss the check of currently used hadronic interaction models by using new Tibet hybrid experimental data. We also plan to build a ground based large and complex/CR observatory at high altitude (4300m a.s.l.) within 10 years.

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