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Shower reconstruction performance of the new Tibet hybrid experiment consisting of YAC-II, Tibet-III and MD arrays

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A new hybrid detector system has been constructed by the Tibet ASgamma collaboration in Tibet, China, since 2014 to measure the chemical composition of cosmic rays in the wide energy range including the knee. The new detector system consists of an AS-core detector-grid (YAC-II) to detect a bundle of high-energy shower particles, the Tibet-III AS array and a MD cluster (large underground water-Cherenkov Muon-Detector cluster). Its goals is to reconstruct the primary energy and composition of cosmic rays at the energies between 50 TeV to 10^{16} eV thereby allowing a detailed investigation of the expected proton-knee, helium-knee and iron-knee. In this paper, we present the accuracy of the shower reconstruction methods based on full Monte Carlo simulations. Implications to the discrimination power of the obtained parameters with respect to the nature of the primary particles will be considered.

Collaboration

– not specified –

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