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A general estimator of the primary cosmic ray energy with the ARGO-YBJ experiment

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The determination of the primary cosmic ray all-particle spectrum with ground-based air shower experiments usually depends on the assumed elemental composition and hadronic interaction model. Here we show that an energy estimator independent of the primary mass composition can be defined by means of shower parameters measured in the core region , as carried out in the ARGO-YBJ experiment. An energy resolution better than 20% is obtained. Being insensitive to the number of muons, this energy determination has only a weak dependence on the hadronic interaction model. The features of this energy estimator have been validated by extensive MC simulations and used in the analysis of the ARGO-YBJ data.

Collaboration

ARGO-YBJ

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