

NONPARAMETRIC DETERMINATION OF ENERGY AND MASS OF PRIMARY COSMIC RAYS AND PARAMETER CORRELATIONS OF CLASSIFIED KASCADE EVENTS

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The data measured by the KASCADE (KArlsruhe Shower Core and Array DEtector) experiment are the basis for a multi-component analysis with the aim of determining the mass composition of the primary cosmic rays in the knee region. We discuss the methods used for estimating the mass of the primary particle by applying neural network and nonparametric classification methods. Recent results of all-particle energy spectra and relative abundances of primary particles for different slant depths are presented. The analyses of measured data indicate a transition to a heavier composition at a knee energy of ca. 5 PeV.

Correlations of shower observables reveal difficulties, when different EAS particle components are incorporated in the analysis. Thus, the necessity of detailed studies of correlations of EAS observables is emphasised.

Presentation: Oral - yes

Topic: HE