

EXPERIMENTS WITH MONONUCLEAR COSMIC RAY BEAMS

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We discuss the capability and accuracy of nonparametric Bayesian and Neural Net methods of classification and parameter estimation for the application to the analysis of the multi-dimensional experimental information provided by the Extensive Air Shower (EAS) observations in the KASCADE experiment. The methodical approach allows an event-by-event analysis of EAS measurements for a nonparametric estimate of the energy spectra of three different mass classes of the primary cosmic ray flux. Special emphasis is put on the possibility to obtain nearly pure (mononuclear) samples of EAS for the two different mass groups. The implications and the potential bias for the estimate of the resulting distributions are discussed and displayed with the observables measured by the KASCADE central detector.