MEASUREMENT OF THE PRIMARY COSMIC RAY ENERGY SPECTRUM USING THE HADRONIC AIR SHOWER COMPONENT

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The hadronic core of extensive air showers is investigated with the large hadron calorimeter of the KASCADE experiment. The detector allows to measure the energy, the position, and the angle of incidence for individual hadrons. Hadronic shower size spectra, using the number of hadrons N_H, as well as the hadronic energy sum $\sum E_H$ are reconstructed for different hadronic energy thresholds of 50, 100, 200, 500, and 1000 GeV. The primary cosmic ray energy spectrum is derived from these spectra for two cases of a hypothetic mass composition, pure proton and pure iron. The real primary spectrum has to ly between these extrema. N_H and $\sum E_H$ in conjunction with the five thresholds allow to reconstruct 10 primary energy spectra. Limits for the observed energy spectrum are calculated by the intersection area of the 10 ranges without using an *a priori* mass composition.