

KASCADE-GRANDE: A CONCLUSIVE EXPERIMENT ON THE KNEE

M. Bertaina for the KASCADE-Grande Collaboration

Dipartimento di Fisica Generale dell'Università, Torino, Italy.

One of the main results so far obtained by KASCADE and EAS-TOP experiments, using high quality multiparametric data, is a picture of an increasingly heavier composition above the knee largely caused by a break in the spectrum of the light component. A change towards a heavier composition above the knee is expected in conventional acceleration models, where the knee is supposed to be rigidity dependent. A convincing verification of this type of model would be the discovery of a knee in the heavy component in the primary energy region around $E_0 = Z_{Fe} \times E_k \approx 1 \div 2 \cdot 10^{17}$ eV. Such an uncovering requires high quality data on the energy spectrum and chemical composition significantly above E_0 . For this purpose a new Extensive Air Shower array (KASCADE-Grande) is being realized at the Forzschungszentrum Karlsruhe by reassembling 38 stations of 10 m^2 each of scintillator counters - basically the electromagnetic detector of EAS-TOP - at a mutual distance of about 130m and covering globally an area of about 0.5 Km^2 next to the KASCADE site in order to operate jointly with the existent KASCADE experiment. In this configuration KASCADE-Grande will cover the primary energy range $10^{15} \text{ eV} < E_0 < 5 \cdot 10^{17} \text{ eV}$. The present status of this new array, its resolutions and capabilities in the reconstruction of average primary composition in the energy range of operation will be discussed.