

## ON THE KNEE IN THE ENERGY SPECTRUM OF COSMIC RAYS

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The enigma of the knee in the cosmic ray energy spectrum is investigated in a joint analysis of results from direct and indirect measurements. The abundances and energy spectra of cosmic ray particles below  $10^{14}$  eV are taken from direct measurements. Compilations of several results will be shown. These spectra can be extrapolated to high energies and are compared to results from indirect measurements. The all-particle energy spectrum obtained from several air shower experiments is fitted by the extrapolations mentioned above and by adopting a cutoff energy for each element proportional to its nuclear charge. The only free parameters are the position and shape of the cutoff, the absolute normalization is given by the direct measurements. The shape of the all-particle spectrum is well reproduced. It will be shown, that the measured cosmic ray energy spectrum in the range from  $10^{11}$  eV to  $10^{17}$  eV can be described in a consistent way. The mass composition derived from the adopted ansatz is compared with air shower measurements.