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4. High energy cosmic rays (HE-CR I)

## **The Knee and beyond: Results from KASCADE-Grande, IceTop and Tunka**

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The experiments studying cosmic rays in the energy range around and above the knee of the spectrum have recently obtained important new results.

In this talk I will review the KASCADE-Grande, ICE-Top and TUNKA-133 results on the all particle energy spectrum, discussing the dependence on the hadronic interaction models used in the EAS simulation and the spectral features detected by these experiments.

Measuring the spectra of the light and heavy primaries spectral features of both spectra, at different energies (from  $\sim 7 \times 10^{14}$  to  $10^{17}$  eV), have been observed. I will show and discuss the more recent data.

These results on the primary spectrum, together with the large scale anisotropies searches, will be discussed, showing their consequences on the knee origin hypothesis and on the transition from galactic to extra-galactic cosmic rays.