

Abstract number: S4-386

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

Are the primary cosmic ray and EAS spectra the same or not?

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Usually it is believed that EAS energy is equal or is proportional to primary particle energy. Of course, taking into account fluctuations in hadron interactions and in EAS development, some difference between EAS and PCR energy spectra appears but the slopes of these spectra are the same with a good accuracy. However, in spite of numerous experiments and various models for interpretation of results of EAS observations, the full picture of PCR energy spectrum and composition is absent. In this talk, an alternative approach in which model of PCR interaction at the knee energy is drastically changed is considered. The consequences for interpretation of results on primary energy spectrum and composition in frame of this model are analyzed. It is shown that practically all peculiarities in the behaviour of primary spectrum and composition can be explained. The results agree with experimental data. Some possible experiments to check the predictions of this approach are proposed.