



Estimations of the muon content of cosmic ray air showers between 10 PeV and 1 EeV from KASCADE-Grande data

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Description of the analysis

- We measured N_μ vs the primary energy from 10 PeV to 1 EeV using KASCADE-Grande EAS data for zenith angles $< 40^\circ$ and we compared the measurements with QGSJET-II-04, EPOS-LHC, SIBYLL 2.3 and SIBYLL 2.3c predictions.
- Due to the lack of a model independent energy estimator, we used the method proposed by NEVOD-DECOR (2010) and SUGAR (2018) using as a reference cosmic ray model the spectrum from the PAO observatory.

Results

- None of the high-energy hadronic interaction models studied here is able to describe consistently the KASCADE-Grande EAS data on N_μ for all zenith angles and energies.
- Attenuation of N_μ with the zenith angle is smaller in data than in MC simulations.
- Observed anomalies could imply that the energy spectrum of muons from real EAS at production site for a given primary energy is harder than the respective model predictions.

