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Estimation of depth of maximum by relative muon content in air showers with energy greater than 5 EeV measured by the Yakutsk array

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Characteristics of muons with a threshold $\varepsilon_{thr} \geq 1$ GeV based on the air showers data in Yakutsk array were analyzed. Quantitative estimation of muons at different distance from the shower axis and the ratio of muon and charged particles at a distance of 600 m are obtained. An empirical relationship between the fraction of muons and longitudinal development – the depth of maximum development X_{max} is found. Calculations of the muon fraction are performed using the QGSjetII-04 for different primary nuclei, and compared with experiment. Mass composition of primary particles induced air showers of highest energies is estimated from the muon component.

Keywords

air showers; air shower muons; relative muon content; depth of maximum; mass composition.

Collaboration

other Collaboration

Subcategory

Experimental Results

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