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Study of small scale fluctuations in charged particle and muon densities at the ground level with no-thinning simulations of extensive air showers

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Abstract content

The particle density in extensive air showers fluctuates at the ground level. These fluctuations, at the scale of the scintillator detector size (several meters), lead to the diversity of the individual detector responses. Therefore, small scale fluctuations contribute to the error in the estimation of the primary energy by a ground array. As a results of analysis of simulated full (unthinned) showers, this contribution is shown to be non-Gaussian. The impact on the primary energy spectrum measured by a ground array is estimated. It is argued that super-GZK events observed by AGASA experiment do not result from the energy overestimation, due to small scale fluctuations, of lower energy events. We confirmed that the muon density at the individual muon detectors obeys the Poisson law. The impact of the fluctuations on the reconstructed muon density at 1000 meters is estimated.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

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