

GRAPES-3 sensitivity for diffuse gamma-ray studies with expanded muon detector

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Extensive air shower (EAS) arrays with muon identification capability are ideal to investigate diffuse γ -rays at multi-TeV energies. The GRAPES-3 experiment at Ooty in India is equipped with a dense array of 400 scintillator detectors and a large area (560 m²) tracking compact muon detector. It is designed to investigate γ -rays and cosmic ray nuclear composition in the energy range of 10^{13} - 10^{16} eV. The muon content in EAS is an effective parameter to discriminate the tiny flux of γ -rays from the overwhelming background of charged cosmic rays. The GRAPES-3 group is constructing another 560-m² area muon detector close to the existing one. With the area getting doubled, a significant enhancement in the rejection of cosmic ray background is expected to be achieved. We carried out a detailed Monte Carlo simulation to compute the cosmic ray rejection efficiency and estimated the GRAPES-3 sensitivity for diffuse γ -ray detection. In this meeting, the results from the simulation study will be presented and the construction status of the muon detector will be updated.

Summary

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