
Search for Discrete Sources of Gamma-rays ($E \geq 30$ TeV) with the GRAPES-3 Experiment

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Abstract

The GRAPES-3 extensive air shower (EAS) array consisting of densely packed 256 scintillation detectors (1m² area) detects EAS produced by primary particles in the energy range from 30 TeV to 10 PeV. A large area (560 m²) muon detector ($E \geq 1$ GeV) allows the muon component in the EAS to be measured well. Gamma-rays are expected to produce showers in the atmosphere which should have very few muons at our observational level. Therefore the GRAPES-3 muon detector is used to classify showers according to their muon content. Monte Carlo simulations have shown that showers initiated by protons and heavier nuclei contain relatively large flux of muons. Based on these simulations we have devised a shower-dependent cut on the muon content of EAS to select preferentially gamma-ray induced showers. We have carried out a search for gamma-rays by analysing data taken during the period, 2000-2002, for several discrete sources such as supernovae and X-ray binaries. The results obtained to date would be presented.