

First Winner

Project Title

Basic Research

Observation of TeV emission from EGRET Gamma-Ray Point Sources



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### Abstract

The ultimate aim of this research is to construct a high-energy Cosmic-Ray, Gamma-Ray Observatory in order to investigate gamma-rays and cosmic-rays with energies higher than 50 TeV which produce an Extensive Air Shower (EAS) upon entering the earth's atmosphere. A prototype of this observatory using a small array of particle detectors was set up on the roof of the physics department building at Sharif University of Technology. With this array  $2\pi$  steradian sky was observed for a period of 5 years and almost 200,000 EAS events were recorded.

Analyzing the data with proper corrections due to the varying depth of overlying atmosphere of this prototype observatory site and due to the magnetic field of the earth has revealed that 10 of the gamma-ray point sources reported by the EGRET experiment on board Compton satellite are emitters of TeV gamma-rays as well. The emission of TeV gamma-rays from these sources had not been reported earlier by other investigators world-wide, and this is the first time observation of TeV emission from these sources.