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Study of the Capabilities of the HAWC Observatory to Detect GRBs

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Abstract content

In this work we discuss the minimum fluence that gamma ray busts (GRBs) in the 1 GeV to 1 TeV energy range must have in order to be detected by the VAMOS array of the HAWC Observatory, under construction at the Sierra La Negra site in Mexico (4100 m a.s.l.), with a 5 sigma significance assuming a flux dN/dE $\propto$ E^-α and an spectral index of -2.7. It is well known that the number of secondary particles (background) increases with the altitude and that 90% of these particles are photons, this is the reason behind the use of water Čerenkov detectors at high altitude. In order to calculate the minimun detectable GRBs fluence we have used Monte Carlo simulation methods for the extensive air showers originated by gamma rays at the VAMOS array. We present zenithal, arrival time and energy distributions for the secondary particles as functions of the energy and inclination of the primary gamma rays.

Summary

Primary author(s) : CASTILLO, Mario (Facultad de Ciencias Físico Matemáticas BUAP)

Co-author(s) : Dr. SALAZAR, Humberto (Facultad de Ciencias Físico Matemáticas BUAP); Dr. VILLASEÑOR, Luis (Instituto de Física y Matemáticas UMSNH)

Presenter(s) : CASTILLO, Mario (Facultad de Ciencias Físico Matemáticas BUAP)

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