Large Array Telescope Tracking for Extended Sources (LATTES)

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Rays gammas of high energies proceeding from the explosions of rays gamma (Gamma Ray Burst) produces muons when they interact with the terrestrial atmosphere. These muons can be detected by a telescope and from the direction of incidence of the particle the trajectory of the primary ray can be reconstructed. This work of research has as objective to draw and to consider the construction of a Telescope of Muons. The telescope has for purpose to measure the flux of muons to the level of the sea, with directional information of each particle separately. The interest to measure the flux of muons in the Rio de Janeiro is associated with the study of cosmic phenomena, particularly to the study of the possibility of explosions of rays gamma to produce a tail in its distribution, with great energy. Evidences on this possibility had been published by contribution TUPI, of the UFF. This phenomenon will be real could be observed in this telescope for the increase of the number of muons come of a direction determined. As the number of bursts of gamma rays is visible on Earth the order of one per day then to measure a correlation with some confidence will be important to build a detector with large angular acceptance. The study simulated is intended to optimize the characterization of a scintillator detector. Each system is formed by a set of 64 plastic scintilador bars with a reading of signal for a fotomultiplicadora in each canal. The coupling of two systems of ortogonais directions forms a detector station xy. The system detector of the telescope is formed by two plans of separate stations xy by a distance between them. The higher plane is formed by a single detector station. To make the characterization of each detector array was done in a simulator program liguagem FORTRAN. This program has a parameter input variables as the width of each scintillator bar, the number of stations in the lower level and distance between the planes of detection. It simulates the incidence of muons in the detector stations xy located in planes upper/lower. The events had been generated taking into account that the azimuthal and zenithal directions distributions are homogeneous. The program registers the position of incidence of each particle in the plastics plates and from the address of each bar reconstructs the trajectory of the incident particle. For each configuration of the detector is possible with the data obtained in the number of events detected simultaneously by each level of detection and the difference between the angles of incidence of each event and its reconstructions characterize the telescope as its efficiency, acceptance and resolution. Present in this work the results for the simulated configurations.