Geophysical Research Abstracts
Vol. 18, EGU2016-14319, 2016
EGU General Assembly 2016
© Author(s) 2016. CC Attribution 3.0 License.

Large surface scintillators as base of impact point detectors and their application in Space Weather

Sindulfo Ayuso, José Medina, Raul Gómez-Herrero, Juan José Blanco, Ignacio García-Tejedor, Oscar García-Población, and Gonzalo Díaz-Romeral

University of Alcalá, Alcalá de Henares, Spain (juanjo.blanco@uah.es)

The use of a pile of two 100 cm x 100 cm x 5 cm BC-400 organic scintillators is proposed as ground-based cosmic ray detector able to provide directional information on the incident muons. The challenge is to get in real time the muon impact point on the scintillator and its arrival direction using as few Photomultiplier Tubes (PMTs) as possible. The instrument is based on the dependence of attenuation of light with the traversed distance in each scintillator. For the time being, four photomultiplier tubes gather the light through the lateral faces (100 cm x 5 cm) of the scintillator. Several experiments have already been carried out. The results show how data contain information about the muon trajectory through the scintillator. This information can be extracted using the pulse heights collected by the PMTs working in coincidence mode. Reliability and accuracy of results strongly depend on the number of PMTs used and mainly on their appropriate geometrical arrangement with regard to the scintillator. In order to determine the optimal position and the minimum number of PMTs required, a Montecarlo simulation code has been developed. Preliminary experimental and simulation results are presented and the potential of the system for space weather monitoring is discussed.