



Iranian Journal of Physics Research, Vol. 10, No. 3, 2010

Origin of hump in lateral distribution of Cherenkov photon density generated by gamma cosmic ray and study of its characteristics

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(Received 14 July 2009 ; in final form 15 March 2010)

Abstract

Energetic secondary particles in gamma and hadron initiated showers can generate Cherenkov photons. Using CORSIKA code and simulation data, different characteristics of lateral distribution of Cherenkov photon density are studied. In particular, physical origin of these differences and also dependence of this distribution on primary energy and altitude of observation level are discussed. It is shown that the existence of a hump in lateral distribution of Cherenkov photon density in gamma initiated showers is a useful tool for separating gamma-hadron and rejecting hadron background in gamma ray astronomy.

Keywords: CORSIKA, Cherenkov photons, gamma ray astronomy, cosmic ray

For the full article refer to the Persian section