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Analysis of high muon multiplicity cosmic events with the ALICE experiment

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Content

ALICE is one of the four big experiments of the LHC at CERN. Located 40 m underground with 30 m of overburden rock it can also operate to detect atmospheric muons produced by cosmic ray interactions with the atmosphere. The analysis of the data collected with cosmic triggers from 2010 until 2013, corresponding to around 30 days of live time, will be presented. Exploiting the specific capability of the ALICE Time Projection Chamber (TPC) in tracking an high number of charged particles, a special emphasis will be addressed in the study of muon bundles, with a particular attention on high muon density events. In particular the muon multiplicity distribution, that gives information on the primary cosmic ray composition in the energy range around the knee, has shown some unexpected events of very high multiplicity. The search and the study of these events, already detected in previous experiments at LEP will be discussed in detail. An explanation of these events found in ALICE, should be possible in terms of standard cosmic ray composition with the use of recent hadronic interaction models.

Session

Cosmic ray and astroparticle physics

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