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The impact of a fixed-target experiment with LHC beam for astroparticle physics

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There are two main points, where the data from a fixed-target experiment with LHC beam will contribute unique information. Firstly, to better understand the inclusive flux of atmospheric neutrinos at very high, PeV, energies. Secondly, to the apparent over-abundance of GeV muons in ultra-high energy extensive air showers. To contribute towards answering these questions, the experimental limitations and requirements for a fixed-target experiment at LHC are presented and discussed. The investigation of forward D-meson production at high-xF is essential in order to distinguish if PeV neutrinos are indeed astrophysical or may also be produced partly within the atmosphere. Furthermore, the production of GeV muons is deeply related to the pion cascade within air showers, and the corresponding pion-air interactions. More precise fixed-target data for pion-Carbon at LHC beam energies will contribute significantly to a better modelling of the muon content of air showers.

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Collaboration

- not specified -

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