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Latest results by the FASER experiment and their implication for forward hadron productions

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The muon puzzle, the excess of the number of muons with respect to simulations in ultra-high energy cosmic rays, was initially reported by the Pierre Auger Observatory in 2015 and confirmed by more recent analyses. This suggests that forward meson production in hadronic interactions is not fully understood. Most scenarios to solve this issue predict less production of forward neutral pions and more production of forward kaons (or other particles) instead.

The FASER experiment at the LHC is sensitive to neutrinos and muons, which are the decay products of forward charged pions and kaons. Recently, the FASER experiment published first measurements of muon and electron neutrinos. By combining these measurements, we can give constraints on forward hadron production, which is a key to solving the muon puzzle. In this talk, we report the latest results from the FASER experiment and their implication for forward hadron productions.

Collaboration(s)

FASER

Author: OHASHI, Ken (Universitaet Bern (CH))

Presenter: OHASHI, Ken (Universitaet Bern (CH))

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