

Proton spectra in HE proton-proton collisions recalculated to laboratory system: the specifics that are reproduced in spectra of astrophysical protons, gamma and neutrino.

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Production, collision, and decay of matter in space, I think, are responsible for the forming of particle spectra that are measured in cosmic rays and astrophysics. Protons, nuclei, and dark matter are the known form of matter. If we understand how a proton produces protons in the collision with another proton (or antiproton), we can predict the form of the spectra of secondary elementary particles that we measure in astrophysical experiments. In such a way, the nature of dark matter becomes clearer.

LHC experiments are ready to provide us with the proton spectra at the extremely high energy of the collision. The deal is only to convert this spectrum into the laboratory system. In this paper, it was shown that spectra of neutrino and cosmic protons reproduce altogether the form of proton production spectrum at the single collision of the initial proton of extremely high energy. The gamma spectrum does not show such specifics, because it is initiated by pion production.

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