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Constraining the searches for the missing part of our universe with ALICE

Friday 25 August 2023 09:50 (20 minutes)

Dark matter is a mysterious and elusive form of matter in our Universe of which we can only measure gravitational effects. According to the most accredited theoretical models, dark matter particles in our galaxy might annihilate and produce standard model particle-antiparticle pairs which, traveling through the galaxy, can reach the Earth and be detected by space-borne experiments such as AMS-02 or GAPS. Nuclei-antinuclei pairs are promising probes for indirect dark matter detection due to their rare production rate in inelastic collisions between cosmic rays and the interstellar medium.

In this talk, recent ALICE measurements of (anti)nuclei production in pp collisions and of antinuclei inelastic cross section will be presented. These results are used to constrain the flux of secondary antinuclei from cosmic ray interactions by modeling their production rate and absorption term in the propagation equation. The current precision of the antinuclei inelastic cross section measurements is expected to be improved in Run 3 using a dedicated experimental setup installed in ALICE whose expected performance will be shown.

Collaboration / Activity

ALICE

Primary author: COLLABORATION, ALICE

Presenter: RATH, Rutuparna (INFN Bologna)

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