Contribution ID: **217** Type: **Oral Contribution**

First measurements of antinuclei inelastic cross sections and their impact on astrophysical dark matter searches

Thursday, 27 October 2022 16:20 (20 minutes)

Space: the final frontier for antinuclei physics. There, antinucleisynthesis models already tested on the bench of hadronic colliders and particle physics experiments are put to work to crack one of the biggest problems of modern physics: the existence and nature of dark matter.

In fact, the observation of an antinucleus in cosmic rays would most probably mean a breakthrough in searches for dark matter. However, to correctly interpret future results, precise knowledge of both the antinucleis' production mechanism and their nuclear inelastic cross sections are needed.
The ALICE collaboration already investigated in detail the anti nucleosynthesis models in small and large colliding systems at the LHC and has recently performed several measurements of antideuteron, $^{3}\overline{\mathrm{H}}$ and $^{3}\overline{\mathrm{He}}$ inelastic cross sections, providing the first experimental information of this kind.

In this talk, the final results on antideuteron and $^{3}\overline{\mathrm{He}}$ inelastic cross-sections and the new results on antitriton inelastic cross-sections are discussed, as well as how, thanks to them, it is possible to determine for the first time the transparency of the galaxy to antinuclei stemming from dark matter and standard model collisions.

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Session Classification: P5 Heavy Ion Collisions and QCD Phases

Track Classification: P5 Heavy Ion Collisions and QCD Phases