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Measuring cross sections for anti-p and anti-d production with COMPASS++/AMBER

Friday, March 29, 2019 11:15 AM (30 minutes)

The abundance of cosmic-ray anti-matter components as a function of the energy, is one of the most promising ways to spot signatures of dark matter annihilation in our galaxy.
The challenge in this line of research resides however in the ability to predict the natural, i.e. not from dark matter, abundance of these species; namely positrons, anti-protons and anti-deuterons.
These particles are produced by the interactions of the most abundant cosmic rays components with the Inter Stellar Medium, mostly protons and He nuclei. Especially for anti-protons and anti-deuterons large part of the expectation uncertainties comes from the limited knowledge of the anti-proton(deuteron) production cross section in the p-p and p-He interactions.
We setup a special program within the COMPASS++/AMBER collaboration to accurately measure these cross sections. I will report about our project and about how these measurements will improve the global sensitivity to dark matter signals.
I will also briefly report on a preliminary measurement of the "p-p to anti-p + X"cross section using past data of the COMPASS experiment.

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