

AntiHelium-3 Search with the GRAMS Experiment

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Gamma-Ray and AntiMatter Survey (GRAMS) is a next-generation experiment using a Liquid Argon Time Projection Chamber (LArTPC) to detect gamma rays and antiparticles. Especially for antiparticle detection, GRAMS could reach high sensitivity within the low energy region ($< 0.5\text{GeV}$) using a cost-effective LArTPC design. GRAMS is projected to be able to make background-free dark matter measurements from antimatter detection in the energy range of 0.1-0.5 GeV/n.

In this poster, I will introduce the GRAMS detection concept and particle identification techniques. With the GRAMS instrument, we could detect antiprotons, antideuterons and potentially antihelium nuclei. I will introduce the method of separating antihelium from the antiproton background. Based on this method, I will talk about the flux limit that GRAMS can reach for antihelium-3. This method will provide an opportunity to test a variety of dark matter models.

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