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The GRAMS Project: MeV gamma-ray observations and antimatter-based indirect dark matter searches

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GRAMS (Gamma-Ray and AntiMatter Survey) is a next-generation experiment that will be the first to target both MeV gamma-ray observations and antimatter-based indirect dark matter searches. With a cost-effective, large-scale LArTPC detector, a single long-duration balloon (LDB) flight can have an order of magnitude improved sensitivity to gamma rays in the poorly-explored MeV energy domain. Additionally, GRAMS has been developed to become a next-generation dark matter search experiment beyond the GAPS project for antimatter survey. The antimatter measurements can provide clean dark matter signatures while validating the possible dark matter detection suggested in the Fermi gamma-ray observations and the AMS-02 antiproton measurements. In this talk, I will start with the overview of the project and then focus on the detection concepts for MeV gamma rays and antiparticles.

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