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Antiproton Annihilation on Argon Nuclei in LArIAT

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Final state topologies of antiproton-nuclei annihilation at rest are similar to theorized bound neutron-antineutron oscillation signatures, which the DUNE liquid argon time projection chamber (LArTPC) will search for among other rare phenomena like proton decay. LArIAT, a LArTPC in a test beam at Fermilab, has observed antiproton annihilation on argon for the first time. This sample provides a unique opportunity to explore the ability of LArTPCs to identify and reconstruct this class of event. Further, studying the multiplicity and energy of particles emerging from annihilation at rest on argon could help validate intranuclear cascade and fragmentation models implemented in simulation toolkits like Geant4.

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