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Dark Matter Annihilations and the Observed Positron Excess from Fermi and PAMELA KATHERINE GARRETT, GINTARAS DUDA, Creighton University — The composition of dark matter remains an unsolved mystery in astroparticle physics and cosmology. State of the art experiments are searching for dark matter using two different methods: direct detection, in which a WIMP-like particle interacts with a detector in the laboratory, and indirect detection, in which products of dark matter annihilations such as neutrinos, gamma rays, and antimatter are detected. Recent results from two indirect detection experiments, Fermi and PAMELA, show a flux of positrons above the expected background signal; this positron excess may point toward a primary source of positrons that could be explained by dark matter annihilations. No such excess is seen in the antiproton flux, however, so dark matter models must be finely tuned. Utilizing GALPROP to generate cosmic ray backgrounds and DarkSUSY to generate supersymmetric models in which the neutralino is the dark matter, we will present an investigation of the characteristics of a neutralino necessary to reproduce the observed positron excess.

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