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Detection of Indirect Signal Dark Matter from the Milky Way

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We study the prediction of the gamma ray signal generated from Galactic halo dark matter (DM) annihilation. The study focuses on the electron and positron pair production resulting from self-conjugate dark matter particles. We use Milky Way (MW) DM density profile measurement from literatures which are fitted with NFW, Burkett and Einasto models. The most important radiative process in the gamma ray regime is the Inverse Compton Scattering (ICS) of photons by highly energetic electron and positron. We also determine the contribution from Final State Radiation and compare the prediction for different DM masses to the published results from Fermi satellite. We assume electron-positron cross-section $<\sigma\nu>=3\times10^{-26}cm^3s^{-1}$ which typical value for a thermal relic. Although the cross-section is correlated with DM mass in the measurement from gamma ray spectral distribution, we expect cross-section value that is not higher than typical value for DM with mass of few GeV. According to our results, NFW profile and mass of few GeV are closer to observational data than other profiles and other masses of DM particle.

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