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## Gamma-Ray Lines from Radiative Dark Matter Decay

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The decay of dark matter particles which are coupled predominantly to charged leptons has been proposed as a possible origin of excess high-energy positrons and electrons observed by cosmic-ray telescopes PAMELA and Fermi LAT. Even though the dark matter itself is electrically neutral, the tree-level decay of dark matter into charged lepton pairs will generically induce radiative two-body decays of dark matter at the quantum level. Using an effective theory of leptophilic dark matter decay, we calculate the rates of radiative two-body decays for scalar and fermionic dark matter particles. Due to the absence of astrophysical sources of monochromatic gamma rays, the observation of a line in the diffuse gamma-ray spectrum would constitute a strong indication of a particle physics origin of these photons. We estimate the intensity of the gamma-ray line that may be present in the energy range of a few TeV if the dark matter decay interpretation of the leptonic cosmic-ray anomalies is correct and comment on observational prospects of present and future Imaging Cherenkov Telescopes, in particular the CTA.

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