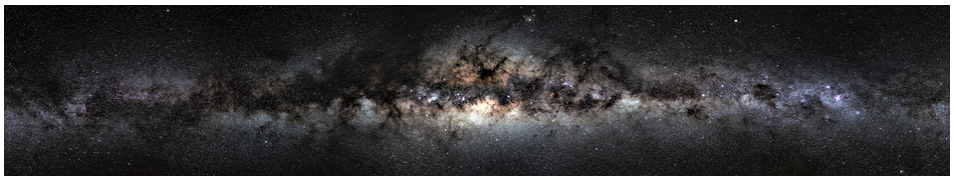

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Multi-messenger Lifetime Constraints on Heavy Decaying Dark Matter

Tuesday, 7 December 2021 08:20 (30 minutes)

Dark matter is one of the cornerstones of the standard cosmological model although we do not know its fundamental nature. Huge effort has been made in order to perform a direct detection of this dark matter component but up to now we have only seen it interacting gravitationally. In this regard the indirect detection is a promising method to search for dark matter, where we try to look at signatures of the dark matter on the astrophysical messengers. One of the best known astrophysical messengers are the gamma-rays. At very-high energies gamma-rays suffer from absorption, leaving the galactic prompt gamma-ray component as the dominant one. In this work we will adopt the prompt flux as the total one. Heavy dark matter with m_{DM}>10^7 GeV leads to higher fluxes in the decaying scenario rather than the annihilating one. In this work we focus on heavy decaying dark matter particles and we revisit the dark matter lifetime bounds placed by the gamma-ray measurements by means of the spectra provided by the recent code HDMSpectra. We provide lifetime limits for dark matter particles with m_{DM}=[10^7−10^{15}] GeV for a set of decay scenarios, where we include the current measurements that provide upper limits on the gamma-ray flux.

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