

Constraints on heavy decaying dark matter from the high energy gamma-ray limits

M. Yu. Kuznetsov

Abstract

We consider decaying dark matter with masses $10^7 \lesssim M \lesssim 10^{16}$ GeV, as a source of ultra-high energy (UHE) gamma rays. Using recent limits on UHE gamma-ray flux for energies $E_\gamma > 2 \cdot 10^{14}$ eV, provided by extensive air shower observatories, we put limits on masses and lifetimes of the dark matter. We found that the lifetime of the dark matter particles is not lower than 10^{20} yr and exceeds 10^{23} yr for some masses. We also apply these constraints to the recent result of 100 PeV photon detection in EAS-MSU experiment and derive that the most part of this signal is not of the dark matter decay origin.