

# PeV neutrino signals from decaying topological dark matter

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## Abstract

In this work, we explore the possibility of topological defects as viable dark matter candidates. The non-thermal production of magnetic monopoles by a phase transition is studied. The Kibble mechanism is analyzed, concluding that it is not a good approach to estimate their abundance and studying the corrections of the Kibble-Zurek model. We also study the effect of monopoles annihilation within this framework. The result of this analysis is that monopoles with a mass around the PeV provide a density compatible with PLANCK observations of the present dark matter density. In addition, recent observations of high energy neutrinos by IceCube show a spectrum that is not compatible with a power law that would be expected in a standard astrophysical scenario. We study the possibility that a decaying dark monopole with a mass in the PeV range provides a promising interpretation of the observed spectrum.

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