LNGS SEMINAR SERIES

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Interpreting the IceCube events by decaying dark matter: hints and constraints

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Abstract

Recent observations by IceCube, notably the three PeV cascades accompanied by events at lower energies are clearly in excess over atmospheric background fluxes and beg for an astroparticle physics explanation. In this talk I will discuss the possibility to interpret the IceCube data by PeV mass scale decaying Dark Matter. I discuss generic signatures of this scenario, including its energy spectrum distortions and peculiar angular distribution. A direct comparison with the data show a good match with both the energy and angular distributions expected from decaying dark matter. I further discuss possible future checks of this scenario. Alternatively, assuming that the IceCube data originate from conventional astrophysical sources, I will discuss what we can learn about the dark matter properties, both its lifetime and annihilation cross section.

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