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Galactic magnetic field and uncon-ventional cosmic ray propagation

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Fermi-LAT, PAMELA, AMS-02, Planck and IceCube are providing us with impressive multimessenger pictures of our Galaxy. The diffuse components of those emissions are commonly modeled assuming uniform cosmic ray (CR) transport properties. Such an approach, however, is not motivated neither by theoretical nor observational arguments. I will show that relaxing the uniform CR propagation assumption it allows to explain several anomalies including the excess of gamma-rays observed by Milagro and Fermi-LAT in the inner Galactic plane and part of the high-energy neutrino emission measured by IceCube.

I will argue as such a behaviour may be explained under quite reasonable conditions of the regular and turbulent components of the Galactic magnetic field.

Author: GRASSO, Dario (INFN)

Presenter: GRASSO, Dario (INFN)

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