



**The Astroparticle Physics Conference** 34<sup>th</sup> International Cosmic Ray Conference July 30 - August 6, 2015 The Hague, The Netherlands

Contribution ID: 228

Type: Highlight talk

## Connections between cosmic-ray physics, gamma-ray data analysis and Dark Matter detection

Monday 3 August 2015 17:00 (30 minutes)

In the first part, I present a detailed overview on recent results regarding modeling of cosmic-ray (CR) propagation in the Galaxy and in the Heliosphere.

In particular I focus on the necessity to go beyond the standard and simplified picture of uniform and homogeneous diffusion, showing that gamma-ray data point towards different propagation regimes in different regions of the Galaxy. I also sketch the impact of large-scale structure on CR observables.

Concerning the propagation of the Heliosphere, I mention the necessity to consider a charge-dependent modulation scenario.

In the second part, I discuss several aspects regarding the recent claim of a gamma-ray excess in the Galactic center region, discussing in particular the interpretation in terms of Dark Matter, compared to other astro-physical interpretations.

I will emphasize the interplay between the non-trivial aspects of CR propagation discussed in the first part and the understanding of the GC excess origin. In particular, I will show in detail how the knowledge of the CR transport parameters and solar modulation is crucial to investigate the compatibility with other channels (namely antiprotons) and to provide alternative astrophysical interpretations.

## Collaboration

- not specified -

## Registration number following "ICRC2015-I/"

245

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Track Classification: GA-TH