



Contribution ID: 69

Type: **not specified**

Anisotropy Variability Induced by the Chaotic Behavior of Cosmic Rays in Magnetic Bottles.

Wednesday, 9 October 2019 16:10 (30 minutes)

Cosmic rays propagate through the galaxy and in doing so, magnetic fields can generate chaotic behavior in their trajectories. Occasionally, these particles can get temporarily trapped in magnetic bottles, which affect the overall description of their propagation. As a result, anisotropy in the arrival distribution at Earth can emerge. In this work, we will show how the chaotic behavior of particles can be characterized by using the Finite-Time Lyapunov Exponents. Concretely, we will study cosmic rays trapped in a magnetic bottle that is subjected to different time perturbations, using the heliosphere as our motivation. Here, we also suggest that time-variability in the anisotropy can be a relevant factor in the understanding of how cosmic rays arrive at the Earth.

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