30th International Cosmic Ray Conference

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Indirect detection of clumps inside the Milky Way with GLAST-like satellites: a deep insight.

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Abstract content

Within the Cold Dark Matter scenario of structure formation, assuming the dark matter is composed by common candidates such as supersymmetric particles, the smallest bound structures have masses as low as 10^-6. High-resolution N-body experiments have shown that a large fraction of these small structures survive hierarchical clustering and can be found within the halo of our own Galaxy. These clumps are expected to boost up significantly the expected annihilation signal. In this work we perform a thorough analysis of the prospects for indirect detection of these objects with GLAST-like experiments, exploring different prescriptions for the formation and evolution of dark matter clumps, and allowing the sub-halos shape parameters to vary within the range currently allowed by numerical simulations. Our results show that an experiment like GLAST can detect the annihilation signal if the subhalo mass distribution within our Galaxy is as clumpy as in the more optimistic, yet not unrealistic, cases we have explored. We also show that the annihilation signal comes preferably from the top-massive (in the range [10^8,10^9] or [10^4,10^9] Msun, depending on the model) rather than the many lightest (10^-6 Msun) sub-Galactic clumps.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 4 (HE part 1), pages 761-764

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