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The Signature of Large Scale Structures on the Very High Energy Gamma-Ray Sky

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Abstract content

If the diffuse extragalactic gamma ray emission traces the large scale structures of the universe, peculiar anisotropy patterns are expected in the gamma ray sky. In particular, because of the cutoff distance introduced by the absorption of 0.1-10 TeV photons on the infrared/optical background, prominent correlations with the local structures within a range of few hundreds Mpc should be present. We provide detailed predictions of the signal based on the PSCz map of the local universe. We also use mock N-body catalogues complemented with the halo model of structures to study some statistical features of the expected signatures. The results are largely independent from cosmological details, and depend mostly on the index of correlation (or bias) of the sources with respect to the large scale distribution of galaxies. The predicted signal in the case of a quadratic correlation (as expected e.g. for a dark matter annihilation contribution to the diffuse gamma flux) differs substantially from a linear correlation case, providing a complementary tool to unveil the nature of the sources of the diffuse gamma ray emission. The chances of the present and future space and ground based observatories to measure these features are discussed.

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'Oliveo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 2 (OG part 1), pages 497-500

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