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The Fermi Gamma-Ray haze from Dark Matter annihilations and Anisotropic Diffusion

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Recently using the gamma-ray data from Fermi-LAT, a diffuse component emission has been revealed towards the galactic center, and extending up to 50 degrees in latitude. This component that has been denoted as the Fermi haze, is generated via inverse Compton scattering by the same electrons that due to synchrotron radiation are responsible for the WMAP haze. The Fermi haze having an elongated in latitude morphology and a significantly harder spectrum compared to any other region in the sky suggests a population of electrons not accounted for by conventional astrophysical sources. Anisotropic diffusion along ordered B-field lines towards the inner region of the Galaxy coupled with a prolate Dark halo can yield the required morphology in the case of annihilating Dark Matter, while still making reasonable assumptions about the necessary B-field profile. Moreover the Dark Matter models assumed can simultaneously explain the WMAP haze and local CR excesses in electrons and positrons.

Authors: Dr DOBLER, Greg (KITP/UCSB); Dr CHOLIS, Ilias (SISSA)

Co-author: Prof. WEINER, Neal (NYU/IAS)

Presenter: Dr CHOLIS, Ilias (SISSA)