

Dark matter and diffuse radio emission in spiral galaxies

Monday 12 April 2021 18:00 (15 minutes)

Diffuse radio emission in the form of the “WMAP/Planck haze” has been established to exist within 1-2 kpc of the center of the Milky Way. If this haze is a product of dark matter annihilations, it should be detectable in spiral galaxies that are similar to the Milky Way. In this project, we use the cosmic ray propagation software, Galprop, to predict the flux, morphology and spectrum of a dark matter induced haze in the Milky Way and in several candidate spiral galaxies. We present constraints obtained by comparing the observed WMAP/Planck haze to our Galprop simulations at 23 GHz. These constraints are used to predict the fluxes of our candidate galaxies at 1.49 GHz. With the inauguration of the MeerKAT telescope in South Africa, this project has the potential to use the state of the art telescope to observe galaxies at L-band frequencies (900 - 1670 MHz). In this work, we evaluate whether MeerKAT observations of nearby spiral galaxies will indeed achieve tight constraints on dark matter parameters.

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Session Classification: Indirect Dark Matter Searches

Track Classification: Dark Matter