

Dark Matter searches with radio observations.

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Abstract content

We present a detailed analysis of the radio synchrotron emission induced by WIMP dark matter annihilations and decays in galactic and extragalactic halos. We show that low frequency data are particularly suitable to search for the galactic emission and current data can already constrain particle dark matter with “thermal” annihilation cross-sections and masses ≤ 10 GeV. We then consider the intensity and angular correlation of the extragalactic radio signal as well as the differential number counts of sources. The diffuse radio background inferred by the ARCADE-2 collaboration is a factor 5-6 larger than the expected contribution from astrophysical sources. Intriguingly, we show that this excess can be accommodated in terms of WIMPs annihilations. We argue that source counts and angular correlation data provided by the next-generation of radio surveys will provide an important test to this hypothesis.

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