

Constraining dark matter models using dwarf galaxy size and luminosity

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The small-scale structure within the Galactic dark matter halo offers a variety of opportunities to test the nature of dark matter, which can be traced by galaxy observations. In particular, models that enhance or suppress the formation of structure will affect the abundance and concentration of dark matter halos. This leads to a distinct signature in local dwarf galaxy observations. In particular, we use the observed relation between the size and luminosity of dwarf galaxies to test dark matter models. By combining high resolution numerical simulations with galaxy formation models, we model galaxies and compare them with observations. The differences among dark matter models considered in our work are characterized through a tilt in the matter power spectrum. In this talk, I will discuss constraints on the matter power spectrum down to very small scales of $k \sim 100 \text{ Mpc}^{-1}$, improving on all current measurements at these scales.

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