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Constraints on the Nature of Dark Matter from the Abundance of Galaxies

Monday 22 October 2018 16:00 (30 minutes)

We show how the abundance and the properties of dwarf galaxies can set tight constraints on Warm Dark Matter (WDM) models. We consider both thermal relics and sterile neutrino (with different production mechanisms) as possible candidates for the WDM, and show that the observed number density of faint (M_UV = -12) high-redshift (z= 6) lensed galaxies in the field provides an unprecedented probe for the mass m_X of thermal relic candidates independently of baryonic physics, as well as strong constraints on the parameter space of sterile neutrino dark matter models. We show that competitive baryon-independent constraints on such models can also be obtained from the abundance of satellite ultra-faint dwarf in nearby galaxy clusters, and that this method has the potentiality for appreciable improvements with next observations.

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