

Substructure of fuzzy dark matter halos and constraints from gravitational lensing

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Using the semi-analytic GALACTICUS code modified for fuzzy dark matter (FDM), we study the statistics of halo substructure in the FDM model. We find that compared to cold dark matter, FDM halos have much less substructure. The compact cores in the center of subhalos are stable with regard to classical tidal stripping, leading to a peak in the subhalo mass function (SHMF) at roughly the mass of the cores. Including mass loss of the core due to quantum tidal stripping, the peak in the SHMF becomes less significant. For higher FDM particle masses the peak is still visible. Based on the semi-analytic realizations of FDM halos, we then compute the lensing power spectrum of substructure. With upcoming ALMA measurements this could potentially put a tight constraint on the mass of FDM particles.

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