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Boosting the boost: the effect of tidal stripping on the subhalo luminosity

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In the paradigm of ΛCDM, structures form hierarchically, implying that large structures contain smaller substructures. These so-called subhalos can enhance the dark matter annihilation signal that one expects to see from a given host halo, the effect of which is called the boost factor. In the literature this boost factor is typically calculated assuming a density profile for the substructure, or analogously a concentration-mass relation, corresponding to that of field halos. However, since subhalos accreted in a gravitational potential of their host loose mass through tidal stripping and dynamical friction, they have a quite characteristic density profile, different from that of the field halos of the same mass. In this work we attempt to quantify the effect of tidal stripping on the boost factor. We find that the boost factor increases by a factor few for host halos ranging from sub-galaxy to cluster masses.

Collaboration

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