

Abstract Submitted
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Modeling of Dwarf Galaxies Containing Wide Binary Stars

KATHARINE LEE, MATTHEW WALKER, Carnegie Mellon University — Detection of wide binary stars in dwarf galaxies is a new method for determining the nature of sub-galactic dark matter structure. Because the gravitational force between the stars in a wide binary pair would be comparatively very weak and susceptible to disruption due to dark matter halo substructures, detection could potentially invalidate the cold dark matter paradigm. The standard method to search for wide binaries is the two-point correlation function, which quantitatively measures clustering within a galaxy. In accordance with this, we model sample dwarf galaxies based on the Plummer density profile with binary pairs added based on a normal distribution in order to detect potential wide binaries. The goal of the creation of this model is to bolster the analytic framework by which the separation function can be used to accurately identify real systems with wide binaries. We show that the distribution of nearest neighbor distances in a model containing binary stars has statistically significant differences when compared to the model without binaries.

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