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Constraining Dwarf Galaxy Dark Matter Distributions: Spherical Jeans Analyses for Line-of-Sight and 3D Velocity Data

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The stellar kinematics in dwarf galaxies can provide a wealth of information about its underlying dark matter distribution. Using line of sight velocity measurements for six classical dwarf galaxies of the Milky Way, we study whether ultralight bosonic dark matter is consistent with the gravitational potential extracted from stellar kinematics. It shows that axion-like particles with masses of order _____ eV are inconsistent with the potential distribution in classical dwarf galaxies unless the hierarchical assembly of the Milky Way did not trace the mean evolution of Milky Way size halos. We also explore the use of three dimensional velocity measurements from Gaia data in spherical Jeans analyses to further constrain dark matter distributions.

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