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Diverse dark matter haloes in Two-field Fuzzy Dark Matter

Fuzzy dark matter (FDM) is a compelling candidate for dark matter, offering a natural explanation for the structure of diffuse low-mass haloes. However, the canonical FDM model with a mass of 10^{-22} eV encounters challenges in reproducing the observed diversity of dwarf galaxies, except for scenarios where strong galactic feedback is invoked. The introduction of multiple-field FDM can provide a potential resolution to this diversity issue. The theoretical plausibility of this dark matter model is also enhanced by the fact that multiple axion species with logarithmically-distributed mass spectrum exist as a generic prediction of string theory. In this talk, I consider the axiverse hypothesis and investigate non-linear structure formation in the two-field fuzzy dark matter (2FDM) model.

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