

Signatures of fuzzy dark matter inside radial critical curves

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We investigated the strong gravitational lensing properties of fuzzy dark matter (FDM) haloes, focussing on the magnification properties near radial critical curves (CCs). Using simulated lenses, we computed magnification maps for a range of axion masses and halo configurations. We show that FDM produces enhanced central magnification and secondary CCs that are not easily reproduced by standard cold dark matter (CDM), even when subhaloes

are included. The strength and scale of these effects depend primarily on the de Broglie wavelength, which is governed by the axion and halo masses. We find that axion masses in the range $m\psi \sim 10^{-22}$ – 10^{-21} eV in galaxy-mass haloes lead to distinctive magnification distributions. Our results suggest that observations of highly magnified, compact sources near radial arcs, such as quasars or supernovae, could serve as a powerful test for the presence of FDM

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