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An analytic model for the sub-galactic matter power spectrum in fuzzy dark matter halos

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Fuzzy dark matter (FDM) is one of the promising alternative dark matter candidates to cold dark matter. The quantum clumps, which is a unique structure of FDM, can be seen in halos in cosmological FDM simulations. In this talk, we first provide our analytic model of the sub-galactic matter power spectrum originating from quantum clumps in FDM halos. Then we show a result of a comparison between the sub-galactic matter power spectrum projected along the line of sight around the Einstein radius with our model and that measured in the strong lens system SDSS J0252+0039. While we find that the current observation provides no useful constraint on the FDM mass, we show that future deep, high spatial resolution observations of strong lens systems can tightly constrain FDM with the mass around 10^{-22} eV.

Presenter: KAWAI, Hiroki

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