Astrometric Search for Ultralight Dark Matter

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Abstract

Precision astrometry offers a way to probe new physics. By measuring the angular position of light sources at unprecedented precision, astrometry could probe minuscule fluctuations of underlying spacetime. In this talk, I will discuss a possibility of probing ultralight dark matter candidates using precision astrometry. Through the coherent and stochastic density fluctuations over the scale of its wavelength, ultralight dark matter perturbs the propagation of light and the geodesics of the observer and source, leading to unique time-dependent signatures in the angular position of background light sources I will show that, with current and future astrometry observations, it is possible to probe dark matter density near the solar system up to a few thousand times the local dark matter density.

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