

Ultralight dark matter searches with KAGRA gravitational wave telescope

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Among various dark matter candidates, bosonic ultralight fields with masses below 1 eV are well motivated by cosmology because they behave as classical wave fields, rather than individual particles. Recently, a number of novel ideas have been proposed to search for ultralight dark matter candidates using laser interferometers at various scales. Those include our proposals to search for axion-like particles (ALPs) and vector fields with laser interferometric gravitational wave detectors. ALPs can be searched for by measuring the oscillating polarization rotation of laser beam. Massive vector field weakly coupled to the standard model sector can also be searched for by measuring the oscillating forces acting on the suspended mirrors of the interferometers. Within the KAGRA collaboration, the analysis of data from the KAGRA's observing run in 2020 to search for vector dark matter, and the installation of polarization optics to the arm cavity transmission ports of the interferometer to search for ALPs are underway. In this talk, we will report the status of such efforts to search for ultralight dark matter with KAGRA gravitational wave telescope.

Reference to paper (DOI or arXiv)

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