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Detecting high frequency (10-100KHz) gravitational waves with levitated micro disks

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We will present an update on the Levitated Sensor Detector (LSD) project for detection of high frequency (10-100kHz) gravitational waves above the region previously probed by LIGO. Well motivated sources of gravitational waves in this frequency band include superradiance from QCD axion clouds around black holes and PBH mergers. The experiment will make use of optically-levitated micron-scale flat disk-likes with the advantage of reduced photon recoil heating. We discuss experimental trapping results of high aspect ratio NaYF4 hexagonal plates and our recent milestone of increasing the test mass by an order of magnitude. Finally, we examine the progress of the 1-meter prototype that is in construction at Northwestern University.

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