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**Search for Lorentz Violation in a High-Frequency Gravitational Experiment Below 50 microns** JOSH LONG, WILLIAM JENSEN, SEAN LEWIS, Indiana University — We describe an ongoing experimental test of the inverse square law below 50 microns. The experiment uses 1 kHz planar oscillators as test masses with a metal membrane stretched between them to suppress backgrounds, a technique showing promise for probing exceptionally small distances and operation at the limit of instrumental thermal noise. Previous data from this experiment, which set new constraints on short-range phenomena motivated by string models, are being re-analyzed for possible signals of Lorentz violation in the Standard Model Extension.

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