

Abstract Submitted
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A Lab-scale Test of the Inverse-Square Law of Gravity RICCO BONICALZI, University of Washington, UNIVERSITY OF WASHINGTON COLLABORATION, UNIVERSITY OF CALIFORNIA AT IRVINE COLLABORATION — Many attempts to quantize gravity entail a violation of the inverse-square law. Our null torsion-pendulum experiment, soon to become operational, is expected to lower by as much as two orders-of-magnitude the upper bound on the strength of any putative inverse-square law violating interaction. A unique feature central to this improvement is the configuration of the mass distribution of both the pendulum and source mass to provide high-sensitivity to the horizontal derivative of the Laplacian of the gravitational potential (a signature of a non-Newtonian force), while simultaneously strongly suppressing the coupling through Newtonian gravity. In this way systematic gravitational effects due to fabrication errors arise only in second-order, so no extraordinary metrology or fabrication measures are necessary to achieve this stronger test.

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