

Abstract Submitted
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Short-range Tests of Gravitational Physics¹ C.D. HOYLE, Z.D. COMDEN, N.K. DUNKLEY, N. HERNANDEZ, H. ISACHSEN, J.S. JOHNSON, G.D. MARTINEZ, A.E. SANCHEZ, J.G. STILLMAN, Humboldt State University — Scenarios attempting to unify the Standard Model and General Relativity often include features that violate the Weak Equivalence Principle (WEP) and/or gravitational Inverse-Square Law (ISL). A violation of either the WEP or ISL at any length scale would bring into question our fundamental understanding of gravity. Motivated by these considerations, undergraduates and faculty at Humboldt State University are operating an experiment to probe gravitational physics below the 50-micron length scale. The experiment employs a torsion pendulum with equal masses of different material arranged as a “composition dipole.” We measure the twist of the torsion pendulum as an attractor mass is oscillated nearby in a parallel-plate configuration, providing a time varying torque on the pendulum. The size and distance dependence of the torque variation provide a means to search for any deviation from the WEP or ISL at untested distance scales. This talk will focus on the analysis of preliminary data and future experimental prospects.

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