Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Update: Parallel-Plate Null Test of the Gravitational Inverse Square Law[1] CHARLES HAGEDORN, University of Washington / CENPA, STEPHAN SCHLAMMINGER, NIST / University of Washington, MATTHEW TURNER, KRISHNA VENKATESWARA, JENS GUNDLACH, University of Washington / CENPA — Gravity has not been experimentally observed at scales smaller than the diameter of human hair, barely smaller than the dark energy length-scale of 85 microns. Our sensitive (10^{-14} N-m/$\sqrt{\text{Hz}}$) torsion balance uses a parallel-plate mass configuration to maximize signal and to create a Gauss's Law null-test of short range gravity. Our first science run is complete, and final analysis is underway. The measurement's sensitivity is expected to be comparable to the existing best limits at $\sim$ 56 microns, but with different leading sources of systematic uncertainty. Sensitivity upgrades are now straightforward, and will commence when our initial results are final. The talk will discuss important systematic effects and analysis challenges inherent to parallel-plate measurements of short-distance forces.

[1]Supported by NSF (PHY0969199, PHY0700912, and PHY0653863) and by DOE support for CENPA

Charles Hagedorn
University of Washington / CENPA

Date submitted: 11 Jan 2013 Electronic form version 1.4