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Improved Test of the Equivalence Principle

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We present results for the most precise lab test of the equivalence principle to date. Our experiment uses a torsion pendulum with beryllium and titanium test bodies arranged in a composition dipole and is mounted on a turntable that rotates with constant angular velocity. A violation of the equivalence principle would result in a differential acceleration of the two materials toward a source mass. We measure a differential acceleration of $1 \pm 6 \times 10^{-15}\ m/s^2$ and analyze our data toward a variety of source masses allowing us to constrain the violation of the equivalence principle for ranges of one meter to infinity. In collaboration with Todd Wagner, Ki-Young Choi, Jens Gundlach, and Eric Adelberger, University of Washington.