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Laboratory Test of Newton's Second Law for Small Accelerations BRIAN WOODAHL, IUPUI, JENS GUNDLACH, STEPHAN SCHLAMMINGER, CHRIS SPITZER, KI CHOI, University of Washington, JENNIFER COY, Saint Joseph's College, EPHRAIM FISCHBACH, Purdue University — We have tested the proportionality of force and acceleration in Newton's second law, F=ma, in the limit of small forces and accelerations. Our tests reach well below the acceleration scales relevant to understanding several current astrophysical puzzles such as the flatness of galactic rotation curves, the Pioneer anomaly, and the Hubble acceleration. We find good agreement with Newton's second law at accelerations as small as 5 x 10^{-14} m/s².

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