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A new technique to determine the value of G MING YIN, Benedict College, Cola, SC, MICHAEL WESCOTT, DAN OVERCASH, GEORGE VOULGARIS, Univ South Carolina, GEORGE COKKINIDES, GA Tech, PAWEL MORAWIEC, TIMIR DATTA, Univ South Carolina — The Big-G or Newton's constant of universal gravitational was implied in the formulation of the law of gravitation proposed by Sir Isaac Newton in the Principia Mathematica (1687). G also appears in Albert Einstein's General Theory of relativity as well as in quantum theories of gravitation. It is the least precisely known fundamental constants of nature; the accuracy of its value (1/10,000) has increased only modestly since Cavendish. A dynamical experiment to measure G is in progress in our laboratory. Some of the challenging problems are the inability to shield background gravitation, knowledge of exact mass distribution and precise determination of time scale. Our technique, (i) explicitly corrects for tidal changes in the background, (ii) incorporates simple solid cylinder geometries, (iii) defines period of oscillation by Fourier analysis of the entire sets of time displacement data and (iv) the measurements are compared with numerical finite element analysis of test mass acceleration. A description of the apparatus and measurements will be presented.

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