Abstract Submitted
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Multi-Mode Apparatus to Resolve the Discrepancy Concerning Big G[1] IAN GUERRERO, GRACE MATTINGLY, Indiana Univ-Purdue Univ, HILDE ISACHSEN, Humboldt State University, S.R. BASTIN, Indiana Univ-Purdue Univ, CHARLES HOYLE, Humboldt State University, RICARDO DECCA, Indiana Univ-Purdue Univ — Although the Newtonian gravitational constant, G, is arguably one of the most important constants in physics, it is also the one known with the least precision. Modern measurements have high uncertainties and are in disagreement by as much as 0.05 percent, nearly 40 times the uncertainty of the most precise measurement. To address these problems a collaboration between Indiana University-Purdue University Indianapolis (IUPUI), Syracuse University (SU), and Humboldt State University (HSU) will build an experiment designed to lower uncertainties and understand discrepancies between modern measurements. In order to determine G, the experiment will follow the work done by Gundlach and Merkowitz, measuring the angular acceleration of a torsion pendulum due to a set of attractor masses. Additionally, multiple measurements will be made using different methods, but within the same apparatus. This approach will provide a means to understand possible systematic errors due to varying methods in previous experiments. In this talk the methods for determining G will be discussed, emphasizing improvements on the metrological aspects. An update on the status of the experimental setup will be presented.

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