

Abstract Submitted  
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**Hoping to get something out of nothing: Searching for hypothetical forces in the Casimir regime** RICARDO S. DECCA, Indiana University-Purdue University Indianapolis, D. LÓPEZ, H. B. CHAN, E. FISCHBACH, D. E. KRAUSE, G. L. KLIMCHITSKAYA, AND V. M. MOSTEPANENKO TEAM — In the first part of this talk our measurements using microelectromechanical systems in the Casimir regime will be discussed. A metrological analysis of these results is used to rule out different models for the expression of the Casimir force at finite temperatures. In the analysis, corrections to the Casimir force were calculated or estimated. These corrections are due to the grain structure of the metal layers (including the variation of optical data and patch potentials), their surface roughness (including nonmultiplicative and diffraction-type effects), and nonlocal effects. In the second part it will be shown how these families of measurements are being used to set more stringent constraints in the search for corrections to the Newtonian gravitational potential. Our latest results and the proposed improvements to obtain better limits will be presented.

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