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Searching for New Forces at Sub-Micron Separations using Casimir Force Experiments D.E. KRAUSE, Wabash College and Purdue University, H.B. CHAN, University of Florida, R.S. DECCA, Indiana University-Purdue University Indianapolis, E. FISCHBACH, Purdue University, C.R. JAMEL, Indiana University-Purdue University Indianapolis, G.L. KLIMCHITSKAYA, North-West Technical University, St. Petersburg, Russia, D. LOPEZ, Lucent Technologies, V.M. MOSTEPANENKO, Noncommercial Partnership “Scientific Instruments,” Moscow, Russia — The search for new sub-micron-ranged forces predicted by extensions to the Standard Model is complicated by the existence of strong background effects like the Casimir force. This talk reviews progress in constraining new forces in the Casimir regime using a microelectromechanical torsion oscillator following two approaches: (1) directly measuring the Casimir force and comparing the result with theoretical predictions, and (2) implementing a “Casimir-less” approach using iso-electronically engineered samples to minimize the effects of the Casimir force.

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