Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electrostatic patch potentials in Casimir force measurements JOSEPH GARRETT, DAVID SOMERS, JEREMY MUNDAY, University of Maryland — Measurements of the Casimir force require the elimination of the electrostatic force between interacting surfaces. The force can be minimized by applying a potential to one of the two surfaces. However, electrostatic patch potentials remain and contribute an additional force which can obscure the Casimir force signal [1-2]. We will discuss recent measurements of patch potentials made with Heterodyne Amplitude-Modulated Kelvin Probe Force Microscopy that suggest patches could be responsible for >1% of the signal in some Casimir force measurements, and thus make the distinction between different theoretical models of the Casimir force (e.g. a Drude-model or a plasma-model for the dielectric response) difficult to discern [3].

[1] C. C. Speake and C. Trenkel, Phys. Rev. Lett. 90, 160403 (2003).
[2] R. O. Behunin, F. Intravaia, D. A. R. Dalvit, P. A. Maia Neto, and S. Reynaud, Phys. Rev. A 85, 012504 (2012).
[3] J. L. Garrett, D. Somers, and J. N. Munday, J. Phys. Condens. Matter (in press) arXiv:1409.5012 (2014).

Joseph Garrett
University of Maryland

Date submitted: 10 Nov 2014 Electronic form version 1.4