

Abstract Submitted  
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**Casimir-like Forces via Charge Fluctuations**<sup>1</sup> DAVID DROSDOFF<sup>2</sup>,  
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LILIA WOODS, University of South Florida — Fluctuations of observables give rise to different forces. Dipolar fluctuations have been studied extensively for a variety of systems as they give rise to Casimir (finite speed of light) and van der Waals (infinite speed of light) interactions. Charge fluctuations can also be responsible for Casimir-like forces with particular importance in biological systems. We show that such phenomena are also of relevance to capacitor systems especially when nanostructured materials are involved. We present a theory with a novel view of charge fluctuations induced interactions via the quantum capacitance concept. It is demonstrated that such Casimir-like forces can be important, especially in nanostructures. The theory is applied to nanoscale capacitors involving graphene and other characteristic materials.

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