



The Casimir effect

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Abstract: We will introduce quantum fluctuations and contrast it with temperature fluctuations. van der Waals interactions between polarizable atoms will be motivated and by including retardations we will introduce Casimir-Polder interactions. Fluctuation-dissipation theorem will be used to motivate the Casimir effect as the interaction between polarizable objects in the presence of quantum fluctuations. Using the multiple scattering formalism, we will discuss the following: how do Casimir energies fall, interaction between corrugated cylinders, many-body contributions to Casimir energies, Casimir energy of fractal configurations, and how certain geometries can lead to repulsive Casimir forces. Like others before me, I will address the talk to a hypothetical alert undergraduate student of limitless dedication.

Biography: K. V. Shajesh is Professor of Practice at SIUC Physics. His research interest is in developing non-perturbative techniques in quantum field theory. He works on quantum electrodynamics and Casimir effect related fields.