

Abstract Submitted  
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**Validity of effective medium theories in Casimir force calculations**<sup>1</sup> RAUL ESQUIVEL-SIRVENT, Instituto de Fisica, Universidad Nacional Autonoma de Mexico — Effective medium theories have been used extensively to describe the dielectric response of inhomogeneous media. This is media that is composed of a mixture of materials with different dielectric functions. The possibility of using inhomogeneous media to control or tune Casimir forces has been discussed in the literature. In this paper we present results for the Casimir force between two inhomogeneous plates described by different effective medium models. In particular we show how the force depends on the model used. This has implications on the comparison between theoretical and experimental results. Furthermore, we calculate the force between an inhomogeneous sphere like multi layered nano shells and a plane to study the effects of effective models when using the proximity force approximations. The conditions under which effective medium models can be used in the context of the Casimir force are discussed in detail.

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