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Liquid- crystalline Casimir forces in the presence of nano-particles

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Abstract

After a short review of nematic liquid crystals and their interactions with the external fields, we investigate the effect of a disordered field which destabilizes the orientational molecular order of a nematic film. We analyze the effect of the disorder in the applied field on the pseudo-Casimir force which is induced due to thermal fluctuations between the confining walls of the nematic film. It is shown that an annealed disorder gives rise to a characteristic way, leading to the enhancement of the strength of the interaction. This, in turn, has some impacts on the fluctuation-induced force studied here.

Keywords: Liquid crystals, the Casimir effect, disorder

For full article, refer to the Persian section