Long-Range Casimir Forces: Theory and Recent Experiments on Atomic Systems | 358 pages | Springer Science & Business Media, 2013 | 9781489912282 | Frank S. Levin, David A. Micha | 2013

Casimir and Casimir-Polder Forces in Graphene Systems: Quantum Field Theoretical Description and Thermodynamics. by Galina L. Klimchitskaya 1,2 and Vladimir M. Mostepanenko 1,2,3,* 1.Â The attractive Casimir-Polder and Casimir forces act between an atom and an uncharged ideal metal plane and between two parallel ideal metal planes, respectively, in vacuum at zero temperature. These forces are entirely caused by the zero-point oscillations of quantized electromagnetic field and depend on the Planck constant â„, speed of light c, atomâ€“plane or planeâ€“plane separation a, and (in the case of the Casimir-Polder force) on the static atomic polarizability. Î± o â‰¡ Î± (0). [1,2]. Longâ€Range Casimir Forces: Theory and Recent Experiments on Atomic Systems. F. Levin, D. Micha, P. Milonni. Physics.Â Book Review: Stars as laboratories for fundamental physics / U Chicago Press, 1996. G. Raffelt. Physics.Â Feinberg and J. Sucher, in Long-Range Casimir Forces: Theory and Recent Experiments in Atomic Systems. 1989. Magic without Magic. attempts the results of recent experiments on the precision measurement of G are. contradictory [1].Â Thus, from the measurement of the Casimir force by the use of an atomic force microscope [19â€“21] the strength-ening of the previously known constraints up to 4500 times was obtained (the dynamical Casimir force measurements [23,33] lead to weaker constraints than those mentioned above). The increased experimental precision calls for a more accurate theory taking into account corrections to the Casimir force due to surface roughness, nite conductivity of the boundary metal and nonzero temperature.Â In Sec. 2 the hypo-thetical long-range forces are discussed originating from both extra dimensional physics and Because measurements of the Casimir force are usually compared to this generalized theory rather than the special case of ideal metals developed by Casimir, we refer to the resulting force as the Casimir-Lifshitz force. Lifshitzâ€™s theory has various limiting forms depending on the materials involved and their separations.Â have been a limited number of force measurements for such systems. In this section we will briefly describe the commonalities and differences between these measure- ments.Â Repulsive Casimir and van der Waals Forces 2257. methods to determine and reduce spurious electrostatic forces, and (c) spheres and cantilevers that would allow detection of weak forces at large surface separations.