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The Casimir force on transparent conductors LIMOR SPECTOR, JEREMY MUNDAY, Department of Physics, Harvard University, Cambridge, MA 02138, FEDERICO CAPASSO, NICHOLAS GEISSE, KEVIN KIT PARKER, Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA 02138
— The Casimir force arises from quantum fluctuations of electromagnetic fields in vacuum and is dependent on the dielectric properties of the interacting materials. This force can have a profound impact on the functionality of systems operating on the micro- and nanoscale. As nanotechnology continues to evolve, the ever-present Casimir force will have to be carefully considered during the design stage. Eliminating or greatly reducing this force could be of tremendous importance. To this end, we have performed Casimir force measurements using atomic force microscopy (AFM) between metals (gold and palladium) and transparent conductors (e.g. indium tin oxide). Due to the transparence of these materials, it is expected that the electromagnetic modes will be less well confined, and the Casimir force will be reduced. Experimental results of such studies will be discussed.

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