

Casimir forces for moving media

Thomas Philbin and Ulf Leonhardt

Summary

The Casimir or van der Waals force between objects in various arrangements is now a subject of experimental investigation. Considerable interest attaches to understanding and manipulating these vacuum forces because of their future relevance in constructing nanotechnological devices. As well as the perpendicular Casimir force between separated materials, a "quantum friction" force has been shown to exist if the surfaces are in relative motion parallel to each other. We present an exact calculation, correct to all relativistic orders, of the vacuum electromagnetic stress tensor between two parallel slabs with a shear motion.

