Casimir torque and force on gratings

Mauro Antezza

Laboratoire Charles Coulomb, Université Montpellier UMR5221, Place Eugène Bataillon - cc 074, Montpellier, 34095, France

We will discuss recent results: (i) on the Casimir torque between two metallic one-dimensional gratings rotated by an angle θ with respect to each other [1]; and (ii) on the Casimir force occurring between interpenetrating gratings [2]. These findings pave the way to the design of a contactless quantum vacuum torsional spring, and sensors with possible relevance to micro- and nanomechanical devices.

[1] Mauro Antezza, H. B. Chan, Brahim Guizal, V.N. Marachevsky, Riccardo Messina, Mingkang Wang, Phys. Rev. Lett. 124 (2020) 013903.

[2] Mingkang Wang, L. Tang, C.Y. Ng, Riccardo Messina, Brahim Guizal, J. A. Crosse, Mauro Antezza, C.T. Chan, H.B. Chan, Nature Communication 12 (2021) 600.