Rectification of a Casimir nanomachine with a triangular wave signal

A Moradian, M R Setare, and A Seyedzahedi

1. Department of Physics, Faculty of Basic Science and Engineering, University of Kurdistan, Kurdestan, Iran
2. Department of Physics, Faculty of Basic Science, University of Kurdistan, Kurdestan, Iran

E-mail: a.moradian@uok.ac.ir

(Received 11 December 2016; in final form 31 January 2017)

Abstract
In this paper, we investigate the Casimir nanosystem composed of two dielectric disks separated by a thin gap. The two disks have quadrisected surface dielectric distributions, the same surface of one is exactly against that of the other. Using scattering approach in the weak coupling limit we show that if the top disk rotates about its axes by an angle $\theta$, the lower disk experiences a torque $\tau(\theta) \propto \sin \theta$. In the following, we investigate the dynamics of the system and calculate the mean non-zero angular velocity.

Keywords: Casimir nanosystem, dielectric, rectification, scattering approach

For full article, refer to the Persian section