

It is already shown that two sinusoidally corrugated plates exert lateral Casimir force to each other. Utilizing lateral Casimir force, it is possible to design several nanomachines. We investigate the effect of noise on Casimir nanomachines. We use a corrugated plate (rack) and a corrugated cylinder (pinion) to design a nano-sensor. We show that the designed Casimir nanomachine is an excitable system. Observing the temporal position signal of the pinion, Casimir force along with friction coefficient could be extracted. Utilizing this method, Casimir force amplitudes of the order 0.1-1 pN could be measured.

It is also shown that Casimir nano-machines could be used for several other purposes: harvesting energy from the ambient noise, synchronization of large number of nano-machines in order to increase the total work and enhancement of the total work due to stochastic resonance.