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## Effective friction induced by the dynamical Casimir emission and its fluctuations

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We consider an optical cavity enclosed by a freely moving mirror attached to a spring and we study the quantum friction exerted by the dynamical Casimir emission on the mechanical motion of the mirror at the mean-field level. Observable signatures of this simplest example of back-reaction effect are studied in both the ring-down oscillations of the mirror motion and in its steady-state motion under a monochromatic force. We go beyond the study of the mean-field dynamics of the mirror and investigate the strictly quantum feature of the damping and the relative quantum fluctuations. This simple model is reminiscent of the pre-heating mechanism by which matter could have been created by the decay of the inflaton field into its true ground state.

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