

Statistical Aspects of Quantum Friction

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We discuss the relevance of usual statistical concepts, such as Markovianity and local thermodynamical equilibrium, for the quantum frictional force acting on a particle moving with constant velocity parallel to a surface.

We show that these aspects have a crucial impact on the value as well as on the functional dependence of quantum friction on relevant parameters like the velocity and the distance of the particle from the surface.

Our discussion relies on fluctuation theorems and perturbation theory, addressing the range of applicability of such approaches in the case of non-equilibrium fluctuation-induced interactions like quantum friction.