

Quantum friction and quantum Brownian motion

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I discuss recent results - obtained in collaboration with W. De Roeck, A. Pizzo, K. Schnelli, Gang Zhou and others - on the phenomena of friction by emission of Cerenkov radiation and diffusion of a quantum tracer particle coupled to a dispersive quantum-mechanical medium/reservoir. The models considered in our work are fully quantum-mechanical. The effective dynamics of the tracer particle is derived by systematically eliminating the degrees of freedom of the reservoir.