



Mathematical Physics

Diffusion for a quantum particle coupled to phonons in $d \geq 3$

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We prove diffusion for a quantum particle coupled to a field of bosons (phonons or photons). The importance of this result lies in the fact that our model is fully Hamiltonian and randomness enters only via the initial (thermal) state of the bosons. This model is closely related to the one considered in [De Roeck, Fröhlich 2011], but various restrictive assumptions of the latter have been eliminated. In particular, depending on the dispersion relation of the bosons, the present result holds in dimension $d \geq 3$.

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