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Matfys library

Random matrix description of nuclear many-body dynamics

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We study the perturbative response of a complex quantum system on time changes of an external parameter X. The driven dynamics of the system is treated in adiabatic basis of the system's Hamiltonian H(X). Within a random matrix approach we obtained non–Markovian Fokker–Planck equation for the occupancies of the adiabatic states. The normal diffusion regime of the driven quantum dynamics is observed at quite small values of the memory time defined by the time scale of the X-variations and the energy–distribution of the coupling matrix elements. It is found that the normal energy diffusion drops out with the width of the matrix elements' energy–distribution and the diffusion may be significantly suppressed with the decrease of the correlations between the matrix elements. The effect of the coupling matrix elements' distribution on transport coefficients of nuclear collection motion is also discussed.

Everybody is welcome to join!