

The simplified stochastic Fermi-Ulam model revisited

A.K. Karlis, F.K. Diakonou, V. Constantoudis, P. Schmelcher

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The description of Fermi acceleration developing in the phase-randomized simplified Fermi-Ulam model (SFUM) can be achieved in terms of a random walk taking place in momentum space. Within this framework the evolution of the probability density function of particle velocities is determined by the Fokker-Planck equation (FPE). However, the standard treatment in the literature leads to a result, which even though is in agreement with the numerical results, it is inconsistent with the transport coefficients used for the construction of the FPE. In this work we present a consistent scheme for the description of Fermi acceleration, resolving this contradiction.

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