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Classical dynamics and particle transport in kicked billiards

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We study nonlinear dynamics of the kicked particle whose motion is confined by square billiard. The kick source is considered as localized at the center of square with central symmetric spatial distribution. It is found that ensemble averaged energy of the particle diffusively grows as a function of time. This growth is much more extensive than that of kicked rotor energy. It is shown that momentum transfer distribution in kicked billiard is considerably different than that for kicked free particle. Time-dependence of the ensemble averaged energy for different localizations of the kick source is also explored. It is found that changing of localization doesn't lead to crucial changes in the time-dependence of the energy. Also, escape and transport of particles are studied by considering kicked open billiard with one and three holes, respectively. It is found that for the open billiard with one hole the number of (non-interacting) billiard particles decreases according to exponential law.

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