

Controlling Strong Chaos by an Aperiodic Perturbation in Area Preserving Maps

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Abstract: We demonstrate a method for controlling strong chaos by an aperiodic perturbation in two-dimensional Hamiltonian systems. The method has the advantages that the controlled system remains conservative property and the selection of the perturbation has a considerable diversity. We illustrate this method with two area preserving maps: the non-monotonic twist map which is a mixed system and the perturbed cat map which exhibits hard chaos. Numerical results show that the strong chaos can be effectively controlled into regular motions, and the final states are always quasiperiodic ones. The method is robust against the presence of weak external noise.

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Key words: controlling chaos, area preserving map, regular motion

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