

"Global observables and infinite mixing"
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Abstract:

Finding a satisfactory definition of mixing for dynamical systems preserving an infinite measure (in short, infinite mixing) is an important open problem. Virtually all the definitions that have been attempted so far use 'local observables', that is, functions that essentially only "see" finite portions of the phase space. We introduce the concept of 'global observable', a function that gauges a certain quantity throughout the phase space. This concept is based on the notion of infinite-volume average, which plays the role of the expected value of a global observable. Endowed with these notions, one can give a number of definitions of infinite mixing. These fall in two categories: global-global mixing, which expresses the "decorrelation" of two global observables, and global-local mixing, where a global and a local observable are considered instead. We then present very recent results about the infinite mixing of certain prototypical dynamical systems of different kinds.