

Time irreversible billiards

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We introduce a new family of billiards which break time reversal symmetry in spite of having piece-wise straight trajectories. We demonstrate that dispersing billiards of our type, e.g. a version of Sinai billiard, are ergodic and mixing with possibly exponential decay of correlations. Such billiards can be implemented by squeezing the transverse magnetic field along lines or along one-dimensional manifolds.