Chaotic billiards with polynomial mixing rates

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This is my joint work with Dr. Chernov. While many dynamical systems of mechanical origin, in particular billiards, are strongly chaotic – enjoy exponential mixing, the rates of mixing in many other models are slow (algebraic, or polynomial). The dynamics in the latter are intermittent between regular and chaotic, which makes them particularly interesting in physical studies. However, mathematical methods for the analysis of systems with slow mixing rates were developed just recently and are still difficult to apply to realistic models. Here we reduce those methods to a practical scheme that allows us to obtain a nearly optimal bound on mixing rates. We demonstrate how the method works by applying it to several classes of chaotic billiards with slow mixing as well as discuss a few examples where the method, in its present form, fails.