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CORRELATION DECAY IN BILLIARDS

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Summary: Motion of a point particle in a planar periodic array of circular scatterers is considered. Motion outside the scatterers is uniform. The scatterers are either rigid ("hard" billiards), or described by an axis–symmetric potential ("soft"). An utmost important feature of this system is the *non-continuity* of the collision-to-collision dynamics, that is, the presence of *singularities*.

Hyperbolicity and ergodicity of these systems have long been investigated (see eg. [5],[4]). Recently, the problem of exponential decay correlations (EDC) was also solved for the 2D hard case ([6],[3]). Our aim was to extend this to high dim. and soft systems using the method in [3].

For high dim. systems, 4 out of five conditions required by the theorem of [3] were checked. On the other hand, the 5-th condition was found to be greatly problematic due to the compilcated structure of singularities (see [1]). For 2D soft systems we managed to apply the method in [3] and obtain EDC for a reasonably defined subclass of the systems discussed in [4].

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