Ergodicity and correlation decay in billiards

abstract of the PhD thesis

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My final aim during my PhD work has been to understand the decay of correlations for multi-dimensional ($d > 2$) dispersing billiards. In this direction, three steps are described in the thesis. First, it is shown that *In multi-dimensional dispersing billiards, the curvature of the singularity manifolds blows up near a two codimensional "pathology" where the manifold is not differentiable.* This is currently the main difficulty in achieving the final goal. Second, *A corrected proof of the Fundamental Theorem is given for the case of algebraic billiards*, that is, when scatterers are defined through algebraic equations. Third, *Exponential decay of correlations is proven for a class of* 2*-dimensional soft billiards.*