

Weak-mixing for billiards in regular polygons

Vincent Delecroix, Université de Paris VII (Denis Diderot)

We know since the work of A. Avila and G. Forni that a generic translation flow is weak-mixing, i.e. it does not admit a rotation factor. Nevertheless, there was no known example of billiard table for which in almost every direction the associated flows are weak-mixing. In this talk we consider the case of billiards in regular $2n$ -gons. For $n=2$ or 3 the billiard flows are conjugate to linear flow on a torus and hence admit two independent rotation factors in any direction. For $n>3$, we prove that the billiard flow in the $2n$ -gon is weak-mixing in almost every direction. Contrarily to the Veech dichotomy where the set of non-uniquely ergodic directions is only countable, we exhibit examples of $2n$ -gons for which the set of non weak-mixing directions has positive Hausdorff dimension. This is a joint work with A. Avila.