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Title: Lorentz gases on quasicrystals

Abstract: The Lorentz gas was originally introduced as a model for the movement of electrons in metals.

It consists of a massless point particle (electron) moving through Euclidean space bouncing off a given set of scatterers $\mathcal{S}$ (atoms of the metal) with elastic collisions at the boundaries $\ partial \mathcal{S}$. If the set of scatterers is periodic in space, then the quotient system, which is compact, is known as the Sinai billiard.

There is a great body of work devoted to Sinai billiards and in many ways their dynamics is well understood.

In contrast, very little is known about the behavior of the Lorentz gases with aperiodic configurations of scatterers which model quasicrystals and other low-complexity aperiodic sets. This case is the focus of our joint work with Rodrigo Trevi\~no.

We establish some dynamical properties which are common for the periodic and quasiperiodic billiard. We also point out some significant differences between the two. The novelty of our approach is the use of tiling spaces to obtain a compact model of the aperiodic Lorentz gas on the plane.