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Divergent directions in some periodic wind-tree models

Vincent Delecroix

The periodic wind-tree model is a family T(a,b) of billiards in the plane in which identical rectangular scatterers of size axb are disposed at each integer point. It was proven by P. Hubert, S. Leli\`evre and S. Troubetzkoy (arXiv:0912.2891v1) that for a residual set of parameters (a,b) the billiard flow in T(a,b) is recurrent in almost every direction. We prove that for many parameters (a,b) there exists a set S of angles of positive Hausdorff dimension such that every billiard trajectory in T(a,b) with initial angle in S is self-avoiding. In particular, the flow in a direction of S is divergent.

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