

Quantitative error term in the counting problem on Veech wind-tree models

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Abstract. We study periodic wind-tree models, billiards in the plane endowed with \mathbb{Z}^2 -periodically located identical connected symmetric right-angled obstacles. We exhibit effective asymptotic formulas for the number of periodic billiard trajectories (up to isotopy and \mathbb{Z}^2 -translations) on Veech wind-tree billiards, that is, wind-tree billiards whose underlying compact translation surfaces are Veech surfaces. This is the case, for example, when the side-lengths of the obstacles are rational. We show that the error term depends on spectral properties of the Veech group and give explicit estimates in the case when obstacles are squares of side length $1/2$.

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