

The number of integer points in a family of anisotropically expanding domains

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We investigate the remainder in the asymptotic formula for the number of integer points in a family of bounded domains in the Euclidean space, which remain unchanged along some linear subspace and expand in the directions, orthogonal to this subspace. We prove some estimates for the remainder, imposing additional assumptions on the boundary of the domain. We study the average remainder estimates, where the averages are taken over rotated images of the domain by a subgroup of the group $SO(n)$ of orthogonal transformations of the Euclidean space \mathbb{R}^n . Using these results, we improve the remainder estimate in the adiabatic limit formula for the eigenvalue distribution function of the Laplace operator associated with a bundle-like metric on a compact manifold equipped with a Riemannian foliation in the particular case when the foliation is a linear foliation on the torus and the metric is the standard Euclidean metric on the torus.

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