Publ. Mat. **50** (2006), 71–85

FOURIER RESTRICTION TO CONVEX SURFACES OF REVOLUTION IN $\mathbb{R}^3$

Faruk Abi-Khuzam and Bassam Shayya

Abstract

If Γ is a C^3 hypersurface in $\mathbb{R}^n$ and $d\sigma$ is induced Lebesgue measure on Γ, then it is well known that a Tomas-Stein Fourier restriction estimate on Γ implies that Γ has a nowhere vanishing Gaussian curvature. In a recent paper, Carbery and Ziesler observed that if induced Lebesgue measure is replaced by affine surface area, then a Tomas-Stein restriction estimate on Γ implies that Γ satisfies the affine isoperimetric inequality. Since the only property needed for a hypersurface to satisfy the affine isoperimetric inequality is convexity, this raised the question of whether a Tomas-Stein restriction estimate can be obtained for flat but convex hypersurfaces in $\mathbb{R}^n$ such as $\Gamma(x) = (x, e^{-1/|x|^m})$, $m = 1, 2, \ldots$. We prove that this is indeed the case in dimension $n = 3$.

2000 *Mathematics Subject Classification.* 42B10, 42B15.
Key words. Fourier transform, restriction, affine surface area.