

A RESTRICTION ESTIMATE IN \mathbb{R}^3

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If f is a function supported on a truncated paraboloid, what can we say about Ef , the Fourier transform of f ? Stein conjectured in the 1960s that for any $p > 3$, $\|Ef\|_{L^p(\mathbb{R}^3)} \lesssim \|f\|_{L^\infty}$. We make a small progress toward this conjecture and prove this estimate for $p > 3 + \frac{3}{13} \approx 3.23$. In the proof, we combine polynomial partitioning techniques introduced by Guth and the two ends argument introduced by Wolff and Tao.