

A resolution to Landis' conjecture in the plane

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In the late 1960s, E.M. Landis made the following conjecture: If u and V are bounded functions, and u is a solution to the Schrodinger equation in $\mathbb{R}^n$ that decays super exponentially, then u must be identically zero. In 1992, V. Z. Meshkov disproved this conjecture by constructing bounded, complex-valued functions u and V that solve the Schrodinger equation in the plane and decay at a rate that is faster than super exponential. The examples of Meshkov were accompanied by qualitative unique continuation estimates for solutions in any dimension. Meshkov's estimates were quantified in 2005 by J. Bourgain and C. Kenig. These results, and the generalizations that followed, have led to a fairly complete understanding of these unique continuation properties in the complex-valued setting. However, Landis' conjecture remains open in the real-valued setting. We will discuss a recent result of A. Logunov, E. Malinnikova, N. Nadirashvili, and F. Nazarov that resolves the real-valued version of Landis' conjecture in the plane.

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