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Eigenfunction Localization for the 2D Periodic Schrödinger Operator

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Abstract. We prove that for any fixed trigonometric polynomial potential satisfying a genericity condition, the spectrum of the 2D periodic Schrödinger operator on the square torus has finite multiplicity and the Fourier series of the eigenfunctions are uniformly exponentially localized about a finite number of frequencies. As a corollary the L^∞ norms of the eigenfunctions are uniformly bounded, answering a question of Toth and Zelditch.