

HARMONIC AND SPECTRAL ANALYSIS

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Spectrality of polytopes and equidecomposability by translations

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(joint work with BOCHEN LIU)

Fuglede conjectured that a domain $A \subset \mathbb{R}^d$ is spectral (that is, A admits an orthogonal basis of exponential functions) if and only if one can tile the space by translated copies of A . Matolcsi and the speaker recently proved this conjecture for convex domains, but for non-convex ones the conjecture was disproved by Tao. However I will present a result joint with Bochen Liu, which implies that if a non-convex polytope $A \subset \mathbb{R}^d$ is spectral then A can be dissected into a finite number of smaller polytopes, which can be rearranged using translations to form a cube.