

Riesz bases, Meyer's quasicrystals and bounded remainder sets

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In this talk we consider systems of exponentials with frequencies belonging to a simple quasicrystal in \mathbb{R}^d . We ask if there exist domains $S \subset \mathbb{R}^d$ which admit such a system as a Riesz basis for the space $L^2(S)$, and show that the answer depends on an arithmetical condition on the quasicrystal.

An important step in the proof is connecting the problem to discrepancy of multi-dimensional irrational rotations, and specifically to the theory of bounded remainder sets. We will explain what characterizes bounded remainder sets for an irrational rotation in \mathbb{R}^d , and observe that any such set admits a Riesz basis of exponentials.

This is joint work with Nir Lev."