Harmonic and Spectral Analysis

International Zoom Conference

May 31 – June 2, 2021

Spectral measures on groups with one prime factor

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A Borel probability measure μ on a locally compact group is called a spectral measure if there exists a countable subset of continuous group characters which forms an orthogonal basis of the Hilbert space $L^2(\mu)$. It is known that a spectral measure is either discrete, absolutely continuous or singular continuous. The characterization of absolutely-continuous spectral measures goes back to Fuglede (1974) who conjectured that a Borel set is spectral if and only if it tiles by translation. Even though the conjecture was disproved, it still remains open for certain groups. In this talk, I will focus on locally compact abelian groups with one prime factor, say p, for example, $\mathbb{Z}/p^n\mathbb{Z}$, $(\mathbb{Z}/p\mathbb{Z})^d$, $\mathbb{Q}_p$ etc. I will discuss the characterization of spectral measures on groups with one prime factor.