SPECTRAL SET CONJECTURE ON FINITE ABELIAN GROUPS

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For a locally compact abelian group G, spectral set conjecture (or Fuglede conjecture) states that a Borel set is spectral iff it tiles the group G. In the case $G = \mathbb{R}^n$, it have been studied for long time since Fuglede formulated this conjecture in 1974. It is proved to be false for $n \geq 3$ but it is still open for $n = 1, 2$. Actually, the spectral set conjecture on $\mathbb{R}^n$ is strongly related to the conjecture on finite abelian groups. In this talk, I will present some recent results in the finite abelian group setting, which are connected to the work of Coven-Meyerowitz and Laba on tiles of $\mathbb{Z}$, as well as the work of Lam-Leung on the structure of vanishing sums of roots of unity.