Finite-dimensional representations constructed from random walks

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Abstract

Let an amenable group $G$ and a probability measure $\mu$ on it (that is finitely-supported, symmetric, and non-degenerate) be given. I will present a construction, via the $\mu$-random walk on $G$, of a harmonic cocycle and the associated orthogonal representation of $G$. Then I describe when the constructed orthogonal representation contains a non-trivial finite-dimensional sub-representation (and hence an infinite virtually abelian quotient), and some sufficient conditions for $G$ to satisfy Shalom’s property HFD. (joint work with A. Erschler, \texttt{arXiv:1609.08585})