

# Finite-dimensional representations constructed from random walks

Narutaka Ozawa

RIMS, Kyoto University  
E-mail: [narutaka@kurims.kyoto-u.ac.jp](mailto:narutaka@kurims.kyoto-u.ac.jp)

## 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 subrepresentation (and hence an infinite virtually abelian quotient), and some sufficient conditions for  $G$  to satisfy Shalom's property HFD. Joint work with A. Erschler, CMH to appear.