

Logic Seminar

Gordon's Conjectures: Pontryagin-van Kampen Duality and Fourier Transform in Hyperfinite Ambience

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Abstract: Using the ideas of E. I. Gordon [Go1], [Go2] we present an approach, based on nonstandard analysis (NSA), to simultaneous approximation of locally compact abelian (LCA) groups and their duals by

finite abelian groups, as well as to approximation of the Fourier transforms on various functional spaces over them by the discrete Fourier transform. In 2012 we proved the three Gordon's Conjectures (GC1-3) which were open since 1991 and are crucial both in the formulations and proofs of the LCA groups and Fourier transform approximation theorems. The proofs of GC1 and GC2 combine some methods of NSA with Fourier-analytic methods of additive combinatorics, stemming from the paper [GR] by Green and Ruzsa and the book [TV] by Tao and Vu. The proof of GC3 relies on a fairly general nonstandard version of the Smoothness-and-Decay Principle. Depending on time, we will survey most of the above mentioned constructions and results.

Tuesday, December 2 at 4:00 PM in SEO 427
