

ARITHMETIC APPROXIMATE LATTICES AND THEIR FINITENESS PROPERTIES

Fudan Topology Seminar

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Abstract: Approximate groups were identified as a natural framework for geometric group theory by Björklund and Hartnick and further developed by Cordes, Hartnick and Tonić, unifying previous research on apparently disparate areas such as finite approximate groups (Breuillard, Green, Tao) and quasi-crystals (Meyer and others).

Approximate groups arise naturally via a cut-and-project procedure from lattices in locally compact groups. A central point I want to make is that S-arithmetic groups are, by their standard definition, the result of cut-and-project procedure. They happen to be groups as long as S contains all infinite places, an assumption usually imposed.

In the context of approximate groups, that assumption can be lifted and gives rise to S-arithmetic approximate groups in characteristic 0 that are not groups but resemble S-arithmetic groups in positive characteristic. The finiteness properties of S-arithmetic subgroups of reductive groups in positive characteristic are determined by the Rank Theorem (joint with Bux and Köhl). I will present joint work with Tobias Hartnick proving a Rank Theorem for S-arithmetic approximate groups in characteristic 0.