FIM
Nachdiplomvorlesung

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High dimensional expanders

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HG G 43, ETH Zürich, Rämistrasse 101

Abstract

Expander graphs in general, and Ramanujan graphs in particular, have played an important role in computer science and pure mathematics in the last 4 decades.

In recent years the area of high dimensional expanders (i.e. simplical complexes/hypergraphs with properties generalizing those of expanding graphs) and Ramanujan complexes is starting to emerge. It appears naturally (so far) in 3 topics:

a) Linial-Meshulam theory of random complexes generalizing the Erdos-Renyi random graphs;

b) Gromov's overlapping properties (these are far reaching extensions of the following result: for every N points set P in the plane, there is a point z which is covered by at least 2/9 of the (N choose 3) triangles determined by P);

c) Testability properties in computer science.

We will discuss these developments and present some new results and open problems.

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