Combinatorics
Seminar

Upper bounds on the size of 4- and 6-cycle-free subgraphs of the hypercube

Bernard Lidický

The University of Illinois at Urbana-Champaign

Abstract: In this talk we show a slight modification of Razborov's flag algebra machinery to be suitable for the hypercube. We use this modified method to show that the maximum number of edges of a 4-cycle-free subgraph of the n-dimensional hypercube is at most 0.6068 times the number of its edges. We also improve the upper bound on the number of edges for 6-cycle-free subgraphs of the n-dimensional hypercube from $\sqrt{2} - 1$ to 0.3755 times the number of its edges.

Additionally, we show that if the n-dimensional hypercube is considered as a poset then the maximum vertex density of three middle layers in an induced subgraph without 4-cycles is at most

$$2.15121 \binom{n}{\lfloor n/2 \rfloor}.$$

This is joint work with József Balogh, Ping Hu and Hong Liu.

4:00 pm   Friday 22 March   2013

W303 Mathematics & Science Center

Mathematics and Computer Science
Emory University