On 2-detour subgraphs of the hypercube

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Abstract

A spanning subgraph H of a graph G is a 2-detour subgraph (or 2-additive spanner) of G if for each $x, y \in V(G)$, $d_H(x, y) \leq d_G(x, y) + 2$. Studying k-additive spanners was motivated by a number of problems in communication networks, broadcasting, routing, etc. We prove a conjecture of Erdős, Hamburger, Pippert, and Weakley by showing that for some positive constant c and every n, each 2-detour subgraph of the n-dimensional hypercube Q_n has at least $c \log n \cdot 2^n$ edges. This is joint work with A. Kostochka.