

Meeting: 999, Nashville, Tennessee, SS 14A, Special Session on Graph Theory and Matroid Theory

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Nana Arizumi, Peter Hamburger and **Alexandr Kostochka*** (kostochk@math.uiuc.edu),
Dept of Mathematics, 1409 W.Green St., Urbana, IL 61801. *Additive spanners in hypercubes*. Preliminary report.

A spanning subgraph G of a graph H is a k -additive spanner of H if for each vertices $x, y \in V(H)$, the distance between x and y in G exceeds that in H by at most k . In this talk, we discuss k -additive spanners of the n -dimensional cube, Q^n , with few edges or with moderate maximum degree. Let $\Delta(k, n)$ denote the minimum possible maximum degree of a k -additive spanner in Q^n . The main result is that for every $k \geq 2$ and $n \geq 21$,

$$e^{-2k} \frac{n}{\ln n} \leq \Delta(k, n) \leq 20 \frac{n \ln \ln n}{\ln n}.$$

On the other hand, for each fixed even $k \geq 4$, there exists a k -additive spanner in Q^n with average degree at most $2 + 2^{4-k/2} + o(1)$. (Received July 22, 2004)