

SIAM STUDENT CHAPTER
SEMINAR

Weakly quasirandom hypergraphs

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Abstract: We consider quasi-random properties of k -uniform hypergraphs. The central notion is uniform edge distribution with respect to large vertex sets. We find several equivalent characterisations of this property and this work can be viewed as a natural extension of the well known Chung-Graham-Wilson theorem for quasi-random graphs.

Those characterisation for hypergraphs have an interesting consequence for the theory of quasi-random graphs. Let K_k be the complete graph on k vertices and let $M(k)$ be the line graph of the graph of the k -dimensional hypercube. We show that the pair of graphs $(K_k, M(k))$ has the following property: if the number of copies of both K_k and $M(k)$ in another (large) graph G are as expected in the random graph of density d , then G is quasi-random (in the sense of the Chung-Graham-Wilson theorem) with density close to d . Those pairs of non-bipartite graphs with this property.

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