

ASYMPTOTIC SHARPNESS OF BOUNDS ON HYPERTREES

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Abstract

The hypertree can be defined in many different ways. Katona and Szabó introduced a new, natural definition of hypertrees in uniform hypergraphs and investigated bounds on the number of edges of the hypertrees. They showed that a k -uniform hypertree on n vertices has at most $\binom{n}{k-1}$ edges and they conjectured that the upper bound is asymptotically sharp. Recently, Szabó verified that the conjecture holds by recursively constructing an infinite sequence of k -uniform hypertrees and making complicated analyses for it. In this note we give a short proof of the conjecture by directly constructing a sequence of k -uniform k -hypertrees.

Keywords: hypertree, semicycle in hypergraph, chain in hypergraph.

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REFERENCES

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- [1] C. Berge, Hypergraphs (Amsterdam, North-Holland, 1989).
- [2] G.Y. Katona and P.G.N. Szabó, *Bounds on the number of edges in hypertrees*, Discrete Math. **339** (2016) 1884–1891.
doi:10.1016/j.disc.2016.01.004
- [3] J. Nieminen and M. Peltola, *Hypertrees*, Appl. Math. Lett. **12** (1999) 35–38.
doi:10.1016/S0893-9659(98)00145-1
- [4] B. Oger, *Decorated hypertrees*, J. Combin. Theory Ser. A **120** (2013) 1871–1905.
doi:10.1016/j.jcta.2013.07.006
- [5] P.G.N. Szabó, *Bounds on the number of edges of edge-minimal, edge-maximal and l -hypertrees*, Discuss. Math. Graph Theory **36** (2016) 259–278.
doi:10.7151/dmgt.1855

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