

t -strong cliques

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A t -strong clique in a graph G is a set of edges of G such that every two of them can be joined by a path of length at most $t - 1$, i.e., it is a clique in the t -th power of the line graph of G . Our goal is to determine the maximum size of a t -strong clique in a graph with given maximum degree Δ . We show that this maximum is at most $1.75\Delta^t + O(\Delta^{t-1})$. It is still far from the lower bound of $\frac{1}{2} \left(\frac{1}{1.59}\right)^{t-1} \Delta^t$ that follows from earlier results. We also give improved results for bipartite graph, $K_{1,r}$ -free graphs and graphs of sufficiently large girth. This research is directly motivated by the problem of determining the extremal value of distance- t chromatic index [1] and has some connections to the degree/diameter problem [2].

REFERENCES

- [1] T. Kaiser, R.J. Kang, The distance- t chromatic index of graphs, *Combin. Probab. Comput.* 23 (2014) 90–101.
- [2] M. Miller, J. Širáň, Moore graphs and beyond: A survey of the degree/diameter problem, *Electron. J. Combin.*, Dynamic survey: DS14 (2013).