Critical Connectivity of Graphs and Domination in Hypergraphs

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Abstract.

A finite, simple, undirected *graph* G is called *k-critically n-connected* or, briefly, an *(n,k)-graph*, if G is non–complete, n-connected, and $G-X$ is not $(n-|X|+1)$-connected for every $X \subseteq V(G)$ with $|X| \leq k$.

In 1993, SU proved that there exists no (n,k)-graph for $n < 2k$, which has been conjectured by MAURER and SLATER in 1977. The sustainable attacks to this ex–conjecture led to further conjectures on (n,k)-graphs; for example, MADER conjectured in 1984 that every (n,k)-graph with $n < 4k$ must contain a vertex of degree n, and that for each $k \geq 3$ the graph obtained from K_{2k+2} by removing a set of $k+1$ independent edges is the *unique* $(2k,k)$-graph.

I will present recent results on (n,k)-graphs and will show how estimations to the transversal number of certain hypergraphs can be used in that field.