

The Inducibility of short directed Cycles

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Razborov's plain flag algebra method has had great success on density problems for which the extremal example is a blow-up of a small graph, i.e. every vertex is replaced by a clique or by a stable set. The method usually fails to deliver sharp results when the extremal structure is an iterated blow up, i.e. every vertex of a small graph is replaced by the graph itself repeatedly.

In this talk I will present results for the maximal induced densities of \vec{P}_3 , \vec{C}_4 , \vec{C}_5 , and C_5 . In each case, the extremal structure is an iterated blow-up (of \vec{C}_4 , \vec{C}_4 , \vec{C}_5 , and C_5 respectively), and the plain flag algebra method fails to give sharp results. We use stability type results to show exact results, using the bounds from the flag algebra calculations.