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On avoiding and completing colorings

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Abstract

All of my papers are related to the problem of avoiding and completing an edge precoloring of a graph. In more detail, given a graph G and a partial proper edge precoloring φ of G and a list assignment L for every non-colored edge of G , can we extend φ to a proper edge coloring of G which avoids L ?

In Paper I, G is the d -dimensional hypercube graph Q_d , a partial proper edge precoloring φ and a list assignment L must satisfy certain sparsity conditions. Paper II still deals with the hypercube graph Q_d , but the list assignment L for every edge of Q_d is an empty set and φ must be a partial proper edge precoloring of at most $d - 1$ edges. In Paper III, G is a (d, s) -edge colorable graph, that is G has a proper d -edge coloring, where every edge is contained in at least $s - 1$ 2-colored 4-cycles, L must satisfy certain sparsity conditions and we do not have a partial proper edge precoloring φ on edges of G . The problem in Paper III is also considered in Paper IV and Paper V, but here G can be seen as the complete 3-uniform 3-partite hypergraph $K_{n,n,n}^3$, where n is a power of two in paper IV and n is an even number in paper V.

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