

Multidesigns in Graph Products

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(joint work with Mike Daven)

If the edges of a graph H can be partitioned into copies of a subgraph G , then we say G divides H . Such a partition is called a G -decomposition or G -design. The graph multidecomposition problem is a variation of the above. By a graph-pair of order t , we mean two nonisomorphic graphs G_1 and G_2 on t non-isolated vertices for which $G_1 \cup G_2 \cong K_t$ for some integer $t \geq 4$. Given a graph-pair (G_1, G_2) , if the edges of H can be partitioned into copies of G_1 and G_2 with at least one copy of G_1 and one copy of G_2 , then we say (G_1, G_2) divides H . We refer to this partition as a (G_1, G_2) -multidecomposition or (G_1, G_2) -multidesign. We will discuss the multidecomposition problem for the cartesian product and tensor product of paths, cycles, and complete graphs.

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