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Krausz dimension and its generalizations in special graph classes

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A {\it krausz (k,m)-partition} of a graph G is the partition of G into cliques, such that any vertex belongs to at most k cliques and any two cliques have at most m vertices in common. The {\it m-krausz} dimension $kdim_m(G)$ of the graph G is the minimum number k such that G has a krausz (k,m)-partition. 1-krausz dimension is known and studied krausz dimension of graph $kdim(G)$.
In this paper we prove, that the problem $"kdim(G)\leq 3"$ is polynomially solvable for chordal graphs, thus partially solving the problem of P. Hlineny and J. Kratochvil. We show, that the problem of finding m-krausz dimension is NP-hard for every $m\geq 1$, even if restricted to (1,2)-colorable graphs, but the problem $"kdim_m(G)\leq k"$ is polynomially solvable for $(\infty,1)$-polar graphs for every fixed $k,m\geq 1$.

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