

ARC-DISJOINT HAMILTONIAN PATHS IN STRONG ROUND DECOMPOSABLE LOCAL TOURNAMENTS

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Abstract

Thomassen, [Edge-disjoint Hamiltonian paths and cycles in tournaments, J. Combin. Theory Ser. B 28 (1980) 142–163] proved that every strong tournament has a pair of arc-disjoint Hamiltonian paths with distinct initial vertices and distinct terminal vertices if and only if it is not an almost transitive tournament of odd order. As a subclass of local tournaments, Li *et al.* [Arc-disjoint Hamiltonian cycles in round decomposable local tournaments, Discuss. Math. Graph Theory 38 (2018) 477–490] confirmed the existence of such two paths in 2-strong round decomposable local tournaments. In this paper, we show that every strong, but not 2-strong, round decomposable local tournament contains a pair of arc-disjoint Hamiltonian paths with distinct initial vertices and distinct terminal vertices except for three classes of digraphs. Thus Thomassen's result is partly extended to round decomposable local tournaments. In addition, we also characterize strong round digraphs which contain a pair of arc-disjoint Hamiltonian paths with distinct initial vertices and distinct terminal vertices.

Keywords: local tournament, round-decomposable, arc-disjoint Hamiltonian paths.

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