Longest path-partitions in generalizations of tournaments

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Abstract

We consider the so-called Path Partition Conjecture for digraphs which states that for every digraph, D, and every choice of positive integers, λ_1, λ_2, such that $\lambda_1 + \lambda_2$ equals the order of a longest directed path in D, there exists a partition of D into two digraphs, D_1 and D_2, such that the order of a longest path in D_i is at most λ_i, for $i = 1, 2$.

We prove that certain classes of digraphs, which are generalizations of tournaments, satisfy the Path Partition Conjecture and that some of the classes even satisfy the conjecture with equality.

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