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Breadth and the Classical Convexity Numbers for Two-path Convexity in Multipartite Tournaments.

In the context of two-path convexity, the authors study the Helly, Caratheodory, Radon and hull numbers associated with the convex subsets of multipartite tournaments. For a general digraph these numbers are shown to be related to the breadth of the lattice of convex subsets. When the digraph is a clone-free multipartite tournament these relationships yield upper bounds for each number. A careful study of the structure of clone-free bipartite tournaments shows that for such digraphs the Helly number and breadth coincide and the Radon number is one larger than each. We also show that the Caratheodory number of a multipartite tournament is at most three and derive other relationships among these numbers. (Received October 01, 2004)