1065-05-224 **Kevin G Milans*** (milans@math.sc.edu), Deptartment of Mathematics, 1523 Greene Street, University of South Carolina, Columbia, SC 29208, and **Daniel Schreiber** and **Douglas B West**. *Acyclic sets in k-majority tournaments.*

Given a set S of linear orders of a ground set X, the *majority digraph* of S is the directed graph on X where there is an edge from u to v when a majority of the orders in S rank u above v. For odd k, a *k-majority tournament* is a tournament that arises as the majority digraph of a set of k orders. When the orders in S are interpreted as a ranking of preferences among a set of alternatives X, acyclic sets in the majority tournament can be viewed as a consensus ranking of a subset of X. We study the maximum size of an acyclic set of vertices in k-majority tournaments.

Every n-vertex 3-majority tournament contains an acyclic set of size $n^{1/2}$; we present a family of 3-majority tournaments which have no acyclic sets of size larger than $2n^{1/2}$. We show that every n-vertex 5-majority tournament contains an acyclic set of size $n^{1/4}$. For general k, every k-majority tournament contains an acyclic set of $n^{f(k)}$, where $f(k) = 3^{-(k-1)/2}$. On the other hand, there are k-majority tournaments whose largest acyclic sets have size $n^{g(k)}$, where $g(k) = O(\log\log k/\log k)$. This is joint work with Dan Schreiber and Douglas B. West. (Received September 14, 2010)