Meeting: 1002, Pittsburgh, Pennsylvania, SS 2A, Special Session on Convexity and Combinatorics

1002-52-78 **Walter D Morris*** (wmorris@gmu.edu), Department of Mathematical Sciences, George Mason University, Fairfax, VA 22030, **Bernd Gaertner**, Institute for Theoretical Computer Science, ETH Zurich, CH-8092 Zurich, Switzerland, and **Leo Ruest**, Institute for Theoretical Computer Science, ETH Zurich, CH-8092 Zurich, Switzerland. *A Generalization of the Holt-Klee Theorem.*

The Holt-Klee theorem is a directed version of Balinski's d-connectivity theorem for convex polytopes. It states that if the edges of a d-polytope P are oriented consistently with the direction of increase of a linear function on P, then there are d disjoint directed paths from the source to the sink. We show that an analogous theorem holds for dual graphs of complete pointed simplicial fans. This leads to a new combinatorial necessary condition for an orientation of the d-cube graph to be induced by a linear function on a polytope combinatorially equivalent to the d-cube. (Received September 03, 2004)