

**Meeting:** 1003, Atlanta, Georgia, SS 12A, AMS-SIAM Special Session on Stochastic, Large-Scale, and Hybrid Systems, I

1003-93-1171      **Laurene V. Fausett\*** (LFausett@GeorgiaSouthern.edu), Department of Mathematical Sciences, Georgia Southern University, Statesboro, GA 30458, and **Kanuri N. Murty** and **Gulcin Tugcu**. *Controllability and Observability of Difference Equations*.

In this paper we present some basic results concerning the relation between the k-th order difference equation and the companion matrix equation. We also establish a necessary and sufficient condition for the equivalence of the general first-order non-homogeneous equation to the k-th order scalar non-homogeneous equation. We then give a set of necessary and sufficient conditions for the complete controllability and observability of the general first-order difference system. (Received October 04, 2004)