1096-05-1494 **Mohit Singh** and **Hehui Wu*** (noshellwhh@gmail.com). *Demand Matching and Correlated Independent Sets in Trees.*

We consider the demand matching problem where we are given a simple bipartite graph $G = (V, E)$, a demand d_e and profit π_e for each edge $e \in E$ and capacity b_v for each vertex $v \in V$. A subset M of edges is called a demand matching if the sum of demands of edges chosen in M incident at v is at most b_v for each vertex v. The goal of the demand matching problem is to select a demand matching M which maximizes the sum of profit of edges in M.

In this paper we give nearly tight upper and lower bounds on the integrality gap of a natural linear programming relaxation for the problem. We show that the integrality gap of the linear program is closely related to finding probability distributions over independent sets of a tree that satisfy certain marginal as well as pairwise correlations. We give a nearly tight characterization for such distributions. We use this characterization to bound the integrality gap of the linear programming relaxation for the demand matching problem in the interval $[2.6999, 2.7086]$. (Received September 15, 2013)