1030-05-256 **Timothy D. LeSaulnier**, **Noah Prince**, **Paul S. Wenger**, **Douglas B. West*** (`west@math.uiuc.edu`) and **Pratik Worah**. *Acquisition number of graphs.*

In a weighted graph G, an *acquisition move* allows a vertex v to take all the weight from a neighbor with weight no larger. Lampert and Slater defined the *acquisition number* $a(G)$ of G to be the least number of vertices onto which all weight can be moved using acquisition moves from an initial distribution of weight 1 at each vertex. They showed that $a(G) \le \lfloor (n+1)/3 \rfloor$ when G is connected and $|V(G)| = n$, with equality for a special tree.

For trees with diameter at most 5, we show that $a(G) \le 3\sqrt{n \log_2(2n)}$. For larger diameters and fixed maximum degree, we build trees with $a(G) = \lfloor (n+1)/3 \rfloor$. For almost all trees, $a(G) \ge 0.06n$. For fixed k, $a(G) \le k$ is testable in time $O(n^{k+2})$ on trees (it is NP-hard on general graphs).

If G has a dominating clique, then $a(G) = 1$, so always $\min\{a(G), a(\overline{G})\} = 1$. If $d(u) + d(v) \ge n - 1$ whenever $uv \in E(\overline{G})$, then $a(G) = 1$ (except for C_5). For random graphs with edge probability at least $\sqrt{3 \ln n / n}$, almost every graph has acquisition number 1.

If $\operatorname{diam} G = 2$, then $a(G) \le 250 \ln n \ln \ln n$, but $a(G)$ may always be 1 or 2 in that case. Finally, we consider the effect on $a(G)$ of edge-deletions and product operations. (Received August 05, 2007)