Lisa Danz* (ldanz@mit.edu), 1540 Morton Ave., Los Altos, CA 94024. The optimal $t$-rubbling number of the complete $m$-ary tree. Preliminary report.

Given a graph with pebbles on the vertices, a rubbling move is either a pebbling move, which removes two pebbles from one vertex and adds one pebble to an adjacent vertex, or a strict rubbling move, which removes one pebble from each of two vertices adjacent to a third vertex $u$ and adds one pebble to vertex $u$. The optimal $t$-rubbling number of a graph is the smallest number $n$ for which there exists a distribution of $n$ pebbles among the vertices such that $t$ pebbles can reach any vertex through a sequence of rubbling moves. We investigate the optimal $t$-rubbling number of the complete $m$-ary tree. We find an exact answer for the case $m \geq 3$, and we find a lower bound and an algorithm for the case $m = 2$. For a fixed tree height, we find that the optimal rubbling number achieves the lower bound for all $t$ sufficiently large. (Received September 13, 2009)