Linda L Eroh* (eroh@uwosh.edu), Cong X Kang and Eunjeong Yi. A Comparison between the metric dimension and zero-forcing number of trees and unicyclic graphs.

We say that a set of vertices $W \subseteq V(G)$ is a resolving set for $G$ if it has the property that for every pair of distinct vertices $x, y \in V(G)$, there is a vertex $w \in W$ such that $d(x, w) \neq d(y, w)$. The metric dimension of $G$, $\dim(G)$, is the minimum number of vertices in a resolving set for $G$. To define the zero-forcing number, we consider a graph with each vertex colored either blue or red. The color-change rule says that a red vertex is recolored blue if it is the only red neighbor of some blue vertex. Then the zero-forcing number $Z(G)$ of a graph $G$ is the minimum number of vertices which must be colored blue initially so that, after a finite number of iterations of the rule, every vertex is colored blue. We show that $\dim(T) \leq Z(T)$ for every tree $T$. For every tree $T$ and edge $e \in E(T)$, we show $\dim(T) - 2 \leq \dim(T + e) \leq \dim(T) + 1$. For any unicyclic graph $G$, we show $\dim(G) \leq Z(G) + 1$. (Received September 11, 2014)