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Zero forcing and the power domination problem in graphs. Preliminary report.

Zero forcing is a process on a graph that starts with a 2-coloring of its vertices, traditionally black and white. Zero forcing continues as long as it is possible to change the color of a vertex by the application of the following rule: every black vertex with exactly one white neighbor changes the color of its white neighbor to black. If at the end of the process all vertices are black, the initial set of black vertices is called a zero forcing set. The zero forcing problem consists of finding zero forcing sets of minimum cardinality.

Power domination is a graph process in which initially a set of vertices observe its closed neighborhood. The process continues as long as the following rule can be applied: an observed vertex with exactly one un-observed neighbor observes the un-observed vertex. If at the end of this process all vertices are observed, the initial set of vertices is a power dominating set. The power domination problem consists of finding power dominating sets of minimum cardinality.

In this talk we will show the relation between these two processes and its contribution to the advancement of research in both problems. Some results are joint work with several co-authors. (Received September 07, 2015)