

1154-05-624

**Jesse Geneson\*** ([geneson@iastate.edu](mailto:geneson@iastate.edu)) and **Leslie Hogben**. *Propagation time for probabilistic zero forcing.*

Zero forcing is a coloring game played on a graph that was introduced more than ten years ago in several different applications. The goal is to color all the vertices blue by repeated use of a (deterministic) color change rule. Probabilistic zero forcing was introduced by Kang and Yi in [Probabilistic zero forcing in graphs, Bull. Inst. Combin. Appl. 67 (2013), 9–16] and yields a discrete dynamical system, which is a better model for some applications. Since in a connected graph any one vertex can eventually color the entire graph blue using probabilistic zero forcing, the expected time to do this is a natural parameter to study. We determine expected propagation time exactly for paths and cycles, establish the asymptotic value for stars, and present asymptotic upper and lower bounds for any graph in terms of its radius and order. We apply these results to obtain values and bounds on  $l$ -round probabilistic zero forcing, throttling number for probabilistic zero forcing, and confidence levels for propagation time. (Received September 08, 2019)