Zero forcing in iterated line digraphs

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Zero forcing is a propagation process on a graph, or digraph, defined in linear algebra to provide a bound for the minimum rank problem. Zero forcing is also related to power domination, a propagation process that models the monitoring of electrical power networks. In this talk we determine the zero forcing number of iterated line digraphs and provide a relationship between zero forcing and power domination interated line digraphs. In particular, for regular iterated line digraphs we determine the minimum rank/maximum nullity, zero forcing number and power domination number, and provide constructions to attain them. We conclude that regular iterated line digraphs present optimal minimum rank/maximum nullity, zero forcing number and power domination number. If time permits, we will show applications of these results to some interesting families of digraphs often used in applications.

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