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Shannon Dillman and **Franklin Kenter*** (kenter@usna.edu). *Leaky Forcing: A New Variation of Zero Forcing.*

Zero forcing is a one-player game played on a graph. The player chooses some set of vertices to color, then iteratively applies a color change rule: If all but one of a colored vertex's neighbors are colored, color (i.e. "force") the remaining uncolored neighbor. The goal is to find the minimum number of vertices to initially color so that all vertices eventually become colored. Equivalent formations of zero forcing have been developed including sensor allocation to solve linear systems (K.-Lin 2018), controllability in follower-leader dynamics (Monshizadeh-Zhang-Camlibel 2014), and edge covering in specific hypergraphs (Brimkov-Fast-Hicks 2016).

We ask what if there is a juncture in a network that has a leak? In the context of zero forcing this corresponds to the following variation we call ℓ -forcing: Given ℓ , find a set of vertices such that for *any* set of ℓ vertices that are unable to force, all vertices will still be colored.

We compute the ℓ -forcing number for selected families of graphs including grid graphs and find examples where adding edges make the graph more "resilient" to leaks. Further, we implement known computational methods for our new leaky forcing variation. (Received August 31, 2020)