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Effects of Geographical Shape on Power Grid Intentional Islanding Models ALEKS GURFINKEL, YAN XU, PER ARNE RIKVOLD, Florida State University — Power grids are interconnected networks of generators and loads that are susceptible to rolling blackouts cascading across the system. To contain the spread of power failures, the *intentional islanding* technique deactivates certain electrical connections, partitioning the power grid into temporarily disconnected clusters with the capacity to act as independent power grids with local generating capacity. Optimized choices of intentional islanding clusters for networks of a given topology (pattern of edges) can be found with the application of network theory. We employ a simulated annealing Monte Carlo method to maximize the internal connectivity of the clusters while minimizing the variance of their power surplus. To serve as test cases in the development of adaptable islanding procedures, it is useful to generate large numbers of randomized power grid networks possessing the topological and statistical properties of real power grids. An important factor affecting the topological structure of power grid networks is the geographical shape of the territory in which the network is embedded. In this poster, we compare the success of intentional islanding for models of long, thin geometries (exemplified by the Florida power grid) and geometries with a square aspect ratio.

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