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Network Theoretical Approach to Partitioning of Real Power Grids BRETT ISRAELS, PER ARNE RIKVOLD, IBRAHIM ABOU HAMAD, Department of Physics, Florida State University, SVETLANA POROSEVA, Mechanical Engineering Department, University of New Mexico — Power grids are innately susceptible to electrical faults. Here we present various network-theoretical approaches to achieve intentional intelligent islanding of a power grid in order to limit cascading power failures in case such a fault occurs. The methods we use can partition networks into communities with local generating capacity. Here we discuss results of using spectral matrix methods along with Monte Carlo methods to analyze and partition the Floridian and Italian high-voltage power grids, as well as the power distribution system for a conceptual all-electric naval vessel. We contrast the effects of approximating the generating capacity of generators according to degree of the generators versus using actual generating capacities.

> Brett Israels Department of Physics, Florida State University

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