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New Network Modeling Tool for the Ground-Based Nuclear Explosion Monitoring Community

Network simulations have long been used to assess the performance of monitoring networks to detect events for such purposes as planning station deployments and assessing network resilience to station outages. Unfortunately, the tools used for these simulations are not widely available and are not based on modern software standards. For these reasons, we are developing and planning to openly release NetMOD (Network Monitoring for Optimal Detection), a Java-based tool designed to assess the performance of ground-based networks. NetMOD is implemented in a modern programming language that is multi-platform and compatible with multi-core technology. The package features an extensive Graphical User Interface to guide users through the simulation process, and will include a User's Manual and a well-validated default parameter set with information for the full seismic, hydroacoustic, and infrasound IMS network. Development of the seismic detection simulation capability is being pursued first, but NetMOD is designed to be extendable through a plugin infrastructure, so new phenomenological models can be added. Infrasound detection and hydroacoustic detection are the next priorities.

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