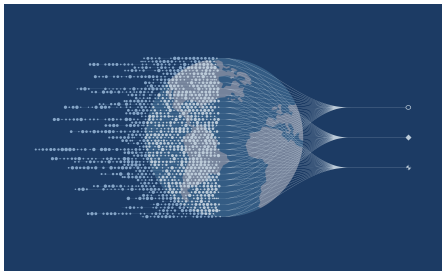

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– a software framework to simulate the response from nuclear explosion detection networks

A software framework - Nuclear Event Monitoring Simulator (NEMOS) has been developed to simulate the response of sensor networks, which are intended to detect, identify, and locate nuclear explosions and other nuclear events. NEMOS simulates the response from seismic sensors, infrasound detection sensors, and several types of radioactivity instruments (GM - tubes, NaI- sensors; either stand-alone or in the vicinity of an air sampling filter; aerosol stations equipped with an HPGe detector, and two types of radioxenon measurement systems). The response models are used in combination with a nuclear source vector and atmospheric transport modelling. When simulating HPGe and NaI detectors, the full spectra is modelled and then automatically analysed using standard radionuclide analysis software. The responses (detection capability and location accuracy) of the seismic and infrasound sensors are calculated using empirical models. Network responses from a large set of simulated explosions are used in a statistical analysis to evaluate different network configurations with respect to verification capability. The analysis include calculation of parameters such as reporting time, detection and location capability, and the capability to identify whether an explosion is nuclear in nature or not.

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