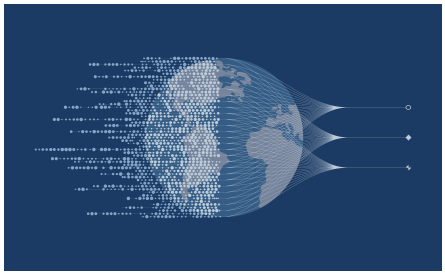

ID: **P4.1-221** Type: **E-poster**

Evaluation of the International Monitoring Systems Detection Capability

The primary method the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO PrepCom) uses in monitoring for underground nuclear explosions is a seismic network of 50 primary stations and 120 auxiliary stations. Currently the primary network's detection capability has been calculated using theoretical methods. But now that a majority of the network has been deployed for a number of years, we can use the empirical method developed by Schorlemmer and Woessner (2008) to determine the network's detection capability. This method relies on using the associated phases reported to the International Seismological Center from 2004 to September 2015 earthquake catalog to determine if an event at a certain distance was observed by a station. Due to the method only using final reviewed catalogs, it takes into account analyst behavior and confidence in picks. From these measurements we obtain detection probabilities for each station in the network for magnitudes of 2 to 6 and for 1 degree distance intervals to determine the probability that a station would detect an earthquake on a point on the Earth's surface. From this, we compute global detection maps for each station and then detection-probability maps for different magnitudes as well as probability-based magnitude completeness maps.

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Session Classification: P4.1 Performance Evaluation of the International Monitoring System

Track Classification: Theme 4. Sustainment of Networks, Performance Evaluation, and Optimization: T4.1 Performance Evaluation of the International Monitoring System