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False Alarm Rate of the International Monitoring System Infrasound Network

The International Monitoring System (IMS) infrasound network has been designed to acquire the necessary data to detect and locate explosions in the atmosphere with a yield equivalent to 1 kiloton of TNT anywhere on Earth. A major associated challenge is the task of automatically processing data from all IMS infrasound stations to identify possible nuclear tests for subsequent review by analysts. This presentation is the first attempt to quantify the false alarm rate (FAR) of the IMS network, and in particular to assess how the FAR is affected by the numbers and distributions of detections at each infrasound station. The results show that the FAR for events formed at only two arrays is extremely high (ranging from 10's to 100's of false events per day across the IMS network, depending on the detector tuning). It is further shown that the FAR for events formed at three or more IMS arrays is driven by ocean-generated waves.

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