

Capability of the IMS Seismic Network in 2013

This study introduces a method of seismic threshold monitoring to assess an upper magnitude limit of a potential seismic event in a certain given geographical region. The method is based on ambient seismic background noise measurements at the individual IMS seismic stations in the year 2013 as well as on global distance correction terms for body wave magnitudes, which are calculated using the seismic reflectivity method. From our investigations we conclude that a global detection threshold of around mb 4.0 can be achieved using only stations from the primary seismic network, a clear latitudinal dependence for the detection threshold can be observed between northern and southern hemisphere. Including the seismic stations of the auxiliary seismic IMS network results in a slight improvement of global detection capability. However, including wave arrivals from distances greater than 120 degrees, mainly PKP-wave arrivals, leads to a significant improvement in average global detection capability. In special this leads to an improvement of the detection threshold on the southern hemisphere. We further investigate the dependence of the detection capability on spatial (latitude and longitude) and temporal parameters, as well as on parameters such as source type and percentage of operational IMS stations.

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Track Classification: 3. Advances in sensors, networks and processing