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Detection and Discrimination of Small Earthquakes and Explosions around North Korean Nuclear Test Site

Recently, the detection of two small seismic events which have occurred close to sites where North Korea carried out underground nuclear weapons tests were reported in literature. A seismic event – considered to be a small earthquake of magnitude 1.5, occurred on 12 May 2010 close to the site of 25 May 2009 underground nuclear test (UNT) in North Korea. Another seismic event of magnitude 2.1 occurred on 11 September 2016 that is correlated to 9 September 2016 UNT and reported as an aftershock of the UNT. We examine additional possible small seismic events around the North Korean test site by using seismic data from stations in southern Korea and northeastern China including IMS seismic arrays, GSN stations, and regional network stations in the region. We assess the best method to classify small explosions from earthquakes in the region based on time, location, source depth, spectral amplitude ratios of regional P and S wave from those seismic events. This presentation will discuss several issues raised by the capability of various networks to detect such tiny explosions and earthquakes, and the best discriminant to classify various source types for the region.

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