ID: Type: **Oral**

Array Analysis for Accurate Relative Event Location at the North Korea Nuclear Test Site

Between October 2006 and September 2016, 5 declared underground nuclear explosions carried out at the Punggye-ri test-site in North Korea were detected both at regional and teleseismic distances. Double-difference relative location estimates are quite network-sensitive with inter-event distance estimates from regional Pn phases consistently longer than estimates from teleseismic P-phases. The seismic wavefield leaving the test-site is more complicated than predicted by a 1D velocity model. Slowness corrections for each of the rays leaving the source region can be found which reduce the double-difference time residuals and provide relative location estimates which are consistent for all seismic measurements. Source-array analysis provides a different approach to modelling the seismic wavefield leaving the DPRK test-site and supports the hypothesis that the slownesses for regional Pn waves are frequently underestimated. Given the number of events now recorded at the test-site, source-array analysis provides an important tool for analyzing subsequent events which may be problematic for classical double-difference methods. One such scenario is a low magnitude event recorded only regionally, with limitations in azimuthal coverage. Another is a test in a different part of the site for which the waveform similarity is significantly diminished at some stations.

Primary author: GIBBONS, Steven John (NORSAR)

Presenter: GIBBONS, Steven John (NORSAR)

Track Classification: 2. Events and Nuclear Test Sites