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and Applying Regional Seismic Travel Time Models to IDC Event Detection and Location

The real time data processing in the IDC will be able to give rapid location parameters of underground nuclear explosion. However for those events with small magnitude there are usually only a few stations near the source or with low enough background-noise level will detect the signals from the event. As a result, the location uncertainty of events will be large and identifying the area for a subsequent inspection will be difficult. For the regional phases, the IDC uses an approach based on station-specific-source-corrections (SSSC) which are the corrections relative to the IASP91 travel times as a function of source location. However, these corrections have been difficult to extend to new stations and regions. The Regional Seismic Travel Time (RSTT) modeling approach (described by Myers, et al., 2009) provides an easier framework to extend the model with additional data. By re-calculating these corrections using the RSTT model, the same approach can be followed to investigate the use of RSTT in the IDC system. The IDC has performed validation tests on events from Eurasia and North America. In general, RSTT compares favorably to the current IDC approach both in terms of the accuracy of the location and its associated uncertainty.

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