Improving infrasonic location estimates for underground nuclear explosions

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Infrasound data from underground nuclear explosions conducted by North Korea in 2006, 2009, 2013 and 2016 were recorded on six seismo-acoustic arrays co-operated by Southern Methodist University (SMU) and the Korean Institute of Geosciences and Mineral Resources (KIGAM). No infrasound signals were observed during the 2006 test, while signals from the others have been used to determine event locations and yield estimations. Prior location studies have demonstrated that wind corrections for back azimuth deviation improve location estimates. Additionally, recent improvements to the Bayesian Infrasonic Source Localization (BISL) methodology have shown to reduce 90% confidence contours for location by 40% through the utilization of propagation-based likelihood priors for celerity and backazimuth deviation from seven years of archival atmospheric specifications. Relocations of the 2009, 2013 and 2016 nuclear explosions will be presented to demonstrate the application of BISL to underground nuclear explosions.