

# Constraints of Crustal Heterogeneity and $Q(f)$ from Regional ( $<4$ Hz) Wave Propagation for the 2009 North Korea Nuclear Test

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The  $Q_0$  values for  $P$  waves ( $Q_p$ ) and  $S$  waves ( $Q_s$ ) for frequencies below 1 Hz reported in Olsen *et al.* (2018) are in error for two reasons. The first reason is the use of incorrect TJN observations for the 2009 event. The data were retrieved directly from the Korea Institute of Geoscience and Mineral Resources (KIGAM), while an instrument response valid only for TJN data contributed to IRIS since 2013 was used. Data and a compatible instrument response from the Ocean Hemisphere Project Data Management Center (OHPDMC) resolved this issue. The other reason is that the modeled  $Q_0$  values for INCN and TJN were erroneously listed as one half of their correct values. After correcting the 2009 TJN records with the proper instrument response, we find that the  $Q_0$  values generating the best agreement with data for the paths from the North Korea Nuclear Test Site (NKNTS) to both stations INCN and TJN should be 400 and TJN should be 700. This includes the values in Table 1, captions of Figures 4 and 11, and Figures S4 and S10, and the text, as well as the supplemental material. We have provided updated figures for the supplemental material that includes the 2009 TJN data with the correct instrument response removed and corresponding

synthetics in best agreement with the data. All figures and text are consistent with the listed  $Q_0$  values for the path from NKNTS to INCN multiplied by a factor of 2, and the  $Q_0$  values for the path from NKNTS to TJN are the same as those from NKNTS to INCN. The exponent of the frequency-dependent  $Q$  relationship ( $\gamma$ ) as well as the parameters of the statistical models of small-scale velocity perturbations listed in the article are correct.

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## Supplemental Material

## REFERENCE

- Olsen, K. B., M. Begnaud, S. Phillips, and B. H. Jacobsen (2018). Constraints of crustal heterogeneity and  $Q(f)$  from regional ( $<4$  Hz) wave propagation for the 2009 North Korea Nuclear Test, *Bull. Seismol. Soc. Am.* **108**, no. 3A, 1369–1383.

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