

# Junghyun Park

CURRICULUM VITA

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## EDUCATION

Ph.D., Southern Methodist University, Dallas, TX, USA, May, 2013

(Supervisor: Prof. Brian W. Stump)

M.Sc., Department of Geology, Kyungpook National University, Daegu, Korea, August, 2008

(Supervisor: Prof. Jung Mo Lee)

B.Sc., Department of Geology, Kyungpook National University, Daegu, Korea, February, 2006

## DISSERTATION

Park, J., (2013), Infrasound Signal Processing from Regional Arrays and Seismic Characteristics of North Korean Nuclear Explosions, *Ph.D. Thesis*, Southern Methodist University.

Park, J., (2008), Relocation of Earthquakes that Occurred in the New Madrid Seismic Zone and Estimation of the Velocity Structure, *M.S. Thesis*, Kyungpook National University, Korea.

Park, J., (2006), Relocation of selected earthquakes occurred in the Gyeongsang Basin from February 1996 to June 2005 (in Korean), *B.S. Thesis*, Kyungpook National University, Korea.

## RESEARCH INTEREST

Earthquake Relocation, Explosion Source Model, Seismo-Acoustic Data Quality Control, Infrasound Event Monitoring, and Infrasound Propagation Model

## SPECIAL ACTIVITIES

2016.06-Present	Seismo-Acoustic Research Scientist, Dept. of Earth Sciences, SMU
2013.06-2016.05	Seismo-Acoustic Research Scientist (Post-Doctoral Fellow Position), Dept. of Earth Sciences, SMU
2010-2013.05	Research Assistant, Dept. of Earth Sciences, SMU
2009-2010	Teaching Assistant, Dept. of Earth Sciences, SMU
2008-2009	Research Assistant, Dept. of Earth Sciences, SMU
2006.12-2007.02	Visitor Student, Los Alamos National Laboratory
2005-2008	Research Assistant, Dept. of Geology, Kyungpook National University, Korea

## CONFERENCE SERVICES

Convener with Charlotte Rowe, Catherine Snelson-Gerlicher, Sean Ford, and Christopher Young for Advances in Explosion Seismo-Acoustic Research, *SSA Annual Meeting*, 14-17 May 2018, Miami, FL.

Convener with Omar Marcillo, Stephen Arrowsmith, and Pierrick Mialle for [S021] On the seismo-acoustic field of natural and man-made sources, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.

## PUBLICATIONS

- Park, J., I.-Y. Che, B. Stump, C. Hayward, F. Dannemann, S. Jeong, K. Kwong, S. McComas, H.R. Oldham, M. Scales, and V. Wright, (2018), Characteristics of Infrasound Signals from North Korean Underground Nuclear Explosions on January 6 and September 9 2016, *Geophys. J. Int.*, 214 (3), 1865-1885.
- Park, J., C. Hayward, and B. Stump, (2018), Assessment of Infrasound Signals Recorded on Seismic Stations and Infrasound Arrays in western US using Ground Truth Sources, *Geophys. J. Int.*, 213 (3), 1608-1628, <https://doi.org/10.1093/gji/ggy042>.
- Park, J., C. Hayward, C. Zeiler, S. Arrowsmith, and B. Stump, (2017), Assessment of Infrasound Detectors Based on Analyst Review, Environmental Effects, and Detection Characteristics, *Bull. Seismol. Soc. Am.*, 107 (2), 674-690.
- Park, J., B. Stump, C. Hayward, S. Arrowsmith, I.-Y. Che, and D. Drob, (2016), Detection of Regional Infrasound Signals Using Array Data –Testing, Tuning, and Physical Interpretation. *J. Acoust. Soc. Am.*, 140 (1), 239-259.
- Park, J., J.M. Lee, C.-M. Chiu, W. Kim, and W.-Y. Kim, (2015), Relocation of Earthquakes in the New Madrid Seismic Zone: Estimation of 1D Velocity Structure and Geometry of a Seismogenic Fault, *Bull. Seismol. Soc. Am.*, 105, 2a, 873-888.
- Park, J., S. Arrowsmith, C. Hayward, B. Stump, and P. Blom, (2014), Automatic Infrasound Detection and Location of Sources in the Western US, *J. Geophys. Res. Atmos.*, 119, 13, 7773-7798.
- Park, J., and B. Stump, (2014), Seasonal Variations of Infrasound Detections and their characteristics in the Western US, *Geosciences J.*, 10.1007/s12303-014-0034-6.
- Che, I.-Y., J. Park, I. Kim, T. S. Kim, and H.-I. Lee, (2014), Infrasound Signals from the Underground Nuclear Explosions of North Korea, *Geophys. J. Int.*, 198 (1), 495-503, doi: 10.1093/gji/ggu150.
- Hale, J.M., J. Park, K.L. Pankow, S.J. Arrowsmith, R. Burlacu, B.W. Stump, C.T. Hayward, and R. Taylor, (2012), Infrasound Signal Characteristics from Small Earthquakes, in *Proceeding of the 2012 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Vol. 2, pp. 687-699.
- Arrowsmith, S., R. Whitaker, A.L. Pichon, Y. Cansi, N. Brachet, M. Charbit, J. Park, B. Stump, and I.-Y. Che, (2012), Development and validation of infrasound data processing algorithms, in *Proceeding of the 2012 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Vol. 2, pp. 665-675.
- Stump, B.W., J. Park, C. Hayward, S. Arrowsmith, and I.-Y. Che, (2012), Performance assessment of multi-array processing with ground truth for infrasonic, seismic and seismo-acoustic events, Final Report, AFRL-RV-PS-TR-2012-0123.
- Park, J., B.W. Stump, C.T. Hayward, S.J. Arrowsmith, and I.-Y. Che, (2011), Multiple-Array Detection, Association, and Location of Infrasound and Seismo-Acoustic Event - Utilization of Ground Truth Information, in *Proceeding of the 2011 Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Vol. 2, pp. 798-807.
- Blackwell, D.D., M. Richards, J. Batir, Z. Frone, and J. Park, (2010), New Geothermal Resource Map of the Northeastern US and Technique for Mapping Temperature at Depth, *GRC Transactions*, Vol. 34, pp.313-318.
- Sica, N., D.D. Blackwell, M. Richards, Z. Frone, and J. Park, (2010), Geothermal Opportunities of Southeastern United States, *GRC Transactions*, Vol. 34, pp.131-135.

Batir, J., D.D. Blackwell, M. Richards, and J. Park, (2010), Evaluation of EGS Resources in the Eastern United States: Illinois, Michigan, Indiana, Western Ohio and Western Kentucky, *GRC Transactions*, Vol. 34, pp.295-299.

Arrowsmith, S., I. Che, C. Hayward, J. Park, and B. Stump, (2009), Multiple-Array Detection, Association, and Location of Infrasonic and Seismo-Acoustic Event - Utilization of Ground Truth Information, in Proceeding of the 2009 *Monitoring Research Review: Ground-Based Nuclear Explosion Monitoring Technologies*, Vol. 2, pp. 706-713.

## **BOOK CHAPTER**

Che, I.-Y., J. Park, T.S. Kim, C. Hayward, and B. Stump, (2019), On the Use of Dense Seismo-Acoustic Arrays for Near-Regional Environmental Monitoring: Challenges in Middle Atmosphere Dynamics and Societal Benefits, *Infrasound Monitoring for Atmospheric Studies*, (Eds.) Alexis Le Pichon, Elisabeth Blanc, and Alain Hauchecorne, Springer International Publishing.

## **WORKING PAPERS IN PROGRESS**

Park, J., B. Stump, I.-Y. Che, C. Hayward, and X. Yang (Forthcoming), Relative Seismic Source Scaling of  $P_n$  Phases from Six North Korean Underground Nuclear Explosions (*in preparation for submission to GJI*)

Park, J., C. Hayward, and B. Stump, (Forthcoming), Data Quality Control Tools Applied to Seismo-Acoustic Arrays in Korea (*in preparation for submission to SRL*).

## **ABSTRACTS**

Park, J., B. Stump, C. Hayward, I.-Y. Che, J. Assink, L. Evers, and P. Smets, (2019), Infrasonic Signals from the 2017 North Korean Underground Nuclear Explosion and the Subsequent Collapse Event, *CTBT Science and Technology*, 24-28 June 2019, Vienna, Austria.

Arrowsmith, S., and J. Park, (2019), When can the combination of seismic and infrasonic data improve event location?, *CTBT Science and Technology*, 24-28 June 2019, Vienna, Austria.

Stump, B., J. Park, C. Hayward, I.-Y. Che, J. Assink, L. Evers, and P. Smets, (2018), Infrasonic Signals from the 2017 North Korean Underground Nuclear Explosion and the Subsequent Collapse Event, *AGU Fall Meeting*, 10-14 December 2018, Washington, D.C.

Park, J., B. Stump, I.-Y. Che, and C. Hayward, (2018), Relative Seismic Source Scaling of  $P_n$  Phases from Six North Korean Underground Nuclear Explosions, *AGU Fall Meeting*, 10-14 December 2018, Washington, D.C.

Park, J., C. Hayward, and B. Stump, (2018), Assessment of Infrasonic Signals Recorded on Single Seismometers and Infrasonic Arrays in the Western United States using Ground Truth Sources, *joint conference of LACSC and SSA*, 14-17 May 2018, Miami, FL.

Park, J., C. Hayward, and B. Stump, (2017), Seismic Source Scaling and Characteristics of Six North Korean Underground Explosions, *AGU Fall Meeting*, 11-15 December 2017, New Orleans, LA.

Park, J., B. Stump, I.-Y. Che, and C. Hayward, (2017), Data Quality Control Tools Applied to Seismo-Acoustic Arrays in Korea, *AGU Fall Meeting*, 11-15 December 2017, New Orleans, LA.

Park, J., I.-Y. Che, C. Hayward, and B. Stump, (2017), Analyses of Regional Seismic and Infrasonic Data from Five North Korean Nuclear Explosions, *CTBT Science and Technology*, 26-30 June 2017, Vienna, Austria.

Dannemann, F.K., P. Blom, J. Park, O. Marcillo, B. Stump and I.-Y. Che, (2017), Improving Infrasonic Location Estimates for Underground Nuclear Explosions, 173<sup>rd</sup> Meeting of the ASA and the 8<sup>th</sup> Forum Acusticum, 25-29 June 2017, Boston, MA.

- Park, J., C. Hayward, and B.W. Stump, (2016), Assessment of Infrasound Detection Capabilities in the western US using a Combination of Infrasound Arrays and Single Seismometers, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.
- Stump, B.W., J. Park, I.-Y. Che, and C. Hayward, (2016), Seismic and Infrasound Characteristics of North Korean Nuclear Explosions Utilizing Regional Data, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.
- Hayward, C., J. Park, and B.W. Stump, (2016), Seismic Yield Estimates of UTTR Surface Explosions, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.
- Pasyanos, M., K. Kim, J. Park, B.W. Stump, C. Hayward, I.-Y. Che, and L. Zhao, (2016), Multi-Phenomenological Analysis of the 12 August 2015 Tianjin, China Chemical Explosion, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.
- Dannemann, F.K., J. Park, O. Marcillo, P.S. Blom, B.W. Stump, and C. Hayward, (2016), Improving Infrasound Signal Detection and Event Location in the Western US Using Atmospheric Modeling, *AGU Fall Meeting*, 12-16 December 2016, San Francisco, CA.
- Blom, P., O. Marcillo, G. Euler, F. Dannemann, and J. Park, (2016), Network-Level Methods for Analyzing Infrasonic Signals, *5<sup>th</sup> Joint ASA/ASJ Meeting*, 28 November – 2 December, Honolulu, HI.
- Park, J., C. Hayward, and B. Stump, (2016), Assessment of Infrasound Signals on Seismic Stations and Infrasound Arrays in the western US using Ground Truth Sources, *SSA Annual Meeting*, 20-22 April 2016, Reno, NV.
- Park, J., B. Stump, C. Hayward, S. Arrowsmith, I.-Y. Che, and D. Drob, (2015), Detection of Regional Infrasound Signals Using Array Data – *Testing, Tuning and Physical Interpretation*, *AGU Fall Meeting*, December 2015, San Francisco, CA.
- Marcillo, O., P. Blom, G. Euler, J. MacCarthy, J. Park, B. Stump, C. Hayward, and F. Dannemann, (2015), On the development and testing of a database-centric pipeline for the analysis of regional infrasound network, *AGU Fall Meeting*, December 2015, San Francisco, CA.
- Park, J., C. Hayward, C. Zeiler, S. Arrowsmith, and B. Stump, (2015), A Comparative Study of Automated Infrasound Detectors using Infrasound Sensors and Single Seismic Stations, *CTBT Science and Technology*, 22-26 June 2015, Vienna, Austria.
- Park, J., C. Hayward, and B. Stump, (2014), Observation and modeling of infrasound signals generated by rocket motor tests and rocket motor demolitions in the western US, *AGU Fall Meeting*, December 2014, San Francisco, CA.
- Charbit, M., S. Arrowsmith, I.-Y. Che, A. Nouvellet, A. Le Pichon, J. Park, and F. Roueff, (2014), Infrasonic Detection Performance in Presence of Nuisance Signal, *European Geosciences Union General Assembly*, 27 April – 02 May 2014, Vienna, Austria.
- Park, J., I.-Y. Che, C. Hayward, and B. Stump, (2013), Relative Seismic Source Scaling of North Korean Nuclear Explosions Utilizing Regional Data, *AGU Fall Meeting*, December 2013, San Francisco, CA.
- Stump, B.W., C. Hayward, and J. Park, (2013), The Complementary Nature of Seismic and Infrasound Technologies in Regional Monitoring (*Invited*), *AGU Fall Meeting*, December 2013, San Francisco, CA.
- Park, J., C. Hayward, C. Zeiler, S. Arrowsmith, and B. Stump, (2013), A Comparative Study of Automated and Analyst Infrasound Detections Using PMCC and InfraMonitor, *SSA Annual Meeting*, 17-19 April 2013, Salt Lake city, UT.
- Park, J., S.J. Arrowsmith, C.T. Hayward, and B.W. Stump, (2012), Regional Infrasound Network Bulletins: An Example in the Western US, *Infrasound Technology Workshop*, 8-12 October 2012, Daejeon, South Korea.
- Park, J., S. Arrowsmith, C. Hayward, and B. Stump, (2012), Automatic Infrasound Detection and Location of Sources in the western US, *AGU Fall Meeting*, 3-7 December 2012, San Francisco, CA.

- Park, J., J.M. Lee, W. Kim, and W.-Y. Kim, (2011), Relocation of Earthquakes in the New Madrid Seismic Zone: 1D Velocity Structure and Geometry of Seismogenic Fault, *SSA Annual Meeting*, 13-15 April 2011, Memphis, TN.
- Frone, Z., D.D. Blackwell, J. Batir, J. Park, and M. Richards, (2010), New Techniques for Heat Flow Calculations and Mapping Temperature At Depth, *AGU Fall Meeting*, 13-17 December 2010, San Francisco, CA.

## **PUBLIC TALKS**

- Park, J., (2019), Infrasound Analysis using Regional Seismo-Acoustic Array Data, 25 January 2019, Department Seminar, Roy M. Huffington Department of Earth Sciences at Southern Methodist University.
- Park, J., (2018), Infrasound Analysis using Regional Seismo-Acoustic Array Data (**Invited**), 5 October 2018, Acoustics Seminar, Acoustics at the University of Texas at Austin.
- Park, J., C. Hayward, and B. Stump, (2018), Assessment of Infrasound Signals Recorded on Single Seismometers and Infrasound Arrays in the Western United States using Ground Truth Sources, *joint conference of LACSC and SSA*, 14-17 May 2018, Miami, FL.
- Park, J., C. Hayward, and B. Stump, (2016), Assessment of Infrasound Signals on Seismic Stations and Infrasound Arrays in the western US using Ground Truth Sources (**Invited**), *SSA Annual Meeting*, 20-22 April 2016, Reno, NV.
- Park, J., (2015), Signal Processing Using Regional Infrasound Arrays, *Seminar in Kyungpook National University, Department of Geology (Invited)*, 2 April 2015, Daegu, South Korea.
- Park, J., (2015), Signal Processing Using Regional Seismo-Acoustic Arrays in Korea and the western US, *Seminar in Korea Institute of Geoscience and Mineral Resources (Invited)*, 31 March 2015, Daejeon, South Korea.
- Park, J., (2015), Signal Processing Using Regional Seismo-Acoustic Arrays in Korea and the western US, *Seminar in Korea Hydro & Nuclear Power Co. (Invited)*, 31 March 2015, Daejeon, South Korea.
- Park, J., S.J. Arrowsmith, C.T. Hayward, and B.W. Stump, (2012), Automatic Infrasound Detection and Location of Sources in the western US (**Invited**), *AGU Fall Meeting*, 3-7 December 2012, San Francisco.
- Park, J., S.J. Arrowsmith, C.T. Hayward, and B.W. Stump, (2012), Regional Infrasound Network Bulletins: An Example in the Western US, *Infrasound Technology Workshop*, 8-12 October 2012, Daejeon, South Korea.
- Park, J., (2012), Analysis of Regional Infrasound Signal: Signal Detection and Event Location, *Seminar in Kyungpook National University (Invited)*, 10 September 2012, Daegu, South Korea.
- Park, J., J.M. Lee, W. Kim, W.-Y. Kim, I.K. Hahm, and I.-C. Ryu, (2007), Relocation of Earthquakes Occurred in the New Madrid Seismic Zone and Velocity Structure, *the fall meeting of the Geological Society of Korea*, 25-26 October 2007, Kangwon National University, South Korea.

## **AWARDS**

- Southern Methodist University Full Scholarship, August, 2008 - 2013
- Brain Korea 21 (BK21) Graduate Fellowship, March, 2006 - August, 2008
- Kyungpook National University Scholarship, September, 2003 - February, 2006
- Kyungpook National University Scholarship, September, 2002 - February, 2003
- Kyungpook National University Full Scholarship for distinguished freshman, March 2002 - August 2002

## **PROFESSIONAL EXPERIENCE**

Discussion Leader in Physical Acoustics Summer School, National Center for Physical Acoustics, University of Mississippi, 3-8 June, 2018.

Participated in 2008 Crustal Scale Refraction Seismic Survey of Korea Crust Research Team (KCRT) by deploying and operating portable seismometers, 2008.

Participated in 2004 Crustal Scale Refraction Seismic Survey of KCRT by assisting the operation of the headquarters, October, 2004.

Participated in 2002 Crustal Scale Refraction Seismic Survey of KCRT by deploying and operating portable seismometers, December, 2002.

## **PROFESSIONAL AFFILIATIONS**

Member, American Geophysical Union

Member, Seismological Society of America

Comprehensive Nuclear-Test-Ban Treaty Organization Youth Group