

Outcome (Paper, publication and Presentation)

1. Reviewed Papers

- [INVITED] Ogasawara, H., H. Kawakata, H. Ishii, M. Nakatani, Y. Yabe, Y. Iio, and The Research Group for the Semi-controlled Earthquake-generation Experiments at Deep Gold Mines, South Africa, Semi-controlled Earthquake-generation Experiments in Deep Gold Mines, South Africa – Monitoring at Closest Proximity to Elucidate Seismogenic Process-, *Zisin (Journal of the Seismological Society of Japan)*, 61, S563-S573, 2009.
- Ogasawara, H., R.J. Durrheim, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, H. Moriya, JST-JICA SA research group, a Japanese - South African collaboration to mitigate seismic risks in deep gold mines, *Proceedings of 1st Hard Rock Safe Safety Conference, South African Institute of Mining and Metallurgy*, 115-134, 2009.
- Durrheim, R.J., H. Ogasawara, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, H. Moriya and the JST-JICA SA research group, *Observational study to mitigate seismic risks in mines: a new Japanese –South African collaborative project, Proceedings of South African Geophysical Association Biennial Technical Meeting and Exhibition*, 73-79, 2009.
- Yabe, Y., J. Philipp, M. Nakatani, G. Morema, M. Naoi, H. Kawakata, T. Igarashi, G. Dresen, H. Ogasawara, and JAGUARS, *Observation of numerous aftershocks of an Mw 1.9 earthquake with an AE network installed in a deep gold mine in South Africa, Earth Planets Space*, 61, e49-e52, 2009.
- Durrheim, R.J., H. Ogasawara, M. Nakatani, Y. Yabe, A.M. Milev, A. Cichowicz, H. Kawakata, H. Moriya, and SATREPS Research Group, *Observational studies to mitigate seismic risks in mines: a new Japanese - South African collaborative research project, The proceedings of the fifth International Seminar on Deep and High Stress Mining, 6-8 October 2010, Santiago, Chile, Australian Centre for Geomechanics*, 215-226, 2010.
- Cichowicz, A., D. Birch, and H. Ogasawara, *Multi-Channel Analysis of Surface Waves: Inversion Strategy, Proceedings of the thirteenth International Conference on Civil, Structural and Environmental Engineering Computing*, Edited by: B.H.V. Topping and Y. Tsompanakis, Civil-Comp Press, Stirlingshire, 2011, doi:10.4203/ccp.96.205.
- Naoi, M., M. Nakatani, Y. Yabe, G. Kwiatek, T. Igarashi, and K. Plenkers, *Twenty thousand aftershocks of a very small (M2) earthquake and their relation to the mainshock rupture and geological structures, Bulletin of the Seismological Society of America*, 101 (5), 2399-2407, 2011, doi: 10.1785/0120100346.
- Durrheim, R.J., H. Ogasawara, M. Nakatani, Y. Yabe, A.M. Milev, A. Cichowicz, H. Kawakata, O. Murakami, M. Naoi, N. Yoshimitsu, T. Kgarume, and the SATREPS Research Group, *a Japanese - South African collaboration to mitigate seismic risks in mines: establishment of experimental sites, Proceedings of the sixth International Seminar on Deep and High Stress Mining, 23-30 March 2012, Perth, Australia (ed. Yves Potvin), Australian Centre for Geomechanics*, pp.173-187.

2. Presentations at scientific meetings

2.1 Invited presentations

Ogasawara, H. and Research Group for SeeSA (Semi-controlled Earthquake-generation Experiment in deep South African gold mines), Monitoring, Prediction and Control of Seismic Activity in deep South African gold mines, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, D11-06, October 21, 2009, Kyoto, Japan.

Nakatani, M., Semi-controlled Earthquake-generation Experiment in deep South African gold mines, the 124th Fukada Geological Institute seminar, January 15, 2010, The Fukada Geological Institute, Tokyo, Japan.

Ogasawara, H., C. Srinivasan, A. Cichowicz, O. Goldbach, K. Bosman, Water-ingress induced seismicity in mines in Japan, India and South Africa, ICDP Workshop "Scientific Deep Drilling to Study Reservoir Triggered Earthquakes at Koyna, India", 21 March 2011, Hyderabad, India.

Ogasawara, H., Keynote: the great eastern Japanese earthquake and tsunami of 11 March 2011 and the research we are doing in South African gold mines, AfricaArray Workshop 2011, 21 November 2011, University of Witwatersrand, Johannesburg, South Africa.

2.2 Oral presentation at scientific meetings (International 10, Japanese domestic 7)

Nakatani, M., M. Naoi, Y. Yabe, H. Ogasawara and JAGUARS, Acoustic Emission Measurements in the Vicinity of a M2 Earthquake Rupture in a Deep Gold Mine in South Africa, French-Japanese International Workshop on Earthquake Source, 5 October 2009, Paris, France.

Ogasawara, H., R.J. Durrheim, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, H. Moriya, T. Satoh, SATREPS, A Japanese-South African Collaboration for Observational Study to Mitigate Seismic Risks in Mines, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, A31-01, October 23, 2009, Kyoto, Japan.

Milev, A., R.J. Durrheim, M. Nakatani, Y. Yabe, H. Ogasawara, JAGUARS Research Group, and SATREPS, SA Gold Mine Research Group, Joint South African and Japanese studies of rock mass behavior around deep level mining in South Africa, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, A31-02, October 23, 2009, Kyoto, Japan.

Naoi, M., M. Nakatani, G. Kwiatek, K. Plenkers, Y. Yabe and JAGUARS group, Aftershock activity of a M2 EQ in a deep South African gold mine - spatial distribution and magnitude-frequency relation -, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, A31-02, October 23, 2009, Kyoto, Japan.

Ogasawara H., R. Durrheim, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, H. Moriya, T. Satoh, S. Murphy, A. Ward, G. Morema, M. Kataka, R. Vermeulen, G. van Aswegen, Research Group of SATREPS, A Japanese - South African Collaboration for Observational Studies to Mitigate Seismic

Risks in Mines (2), ABSTRACTS, Japan Geoscience Union Meeting 2010, SSS020-13, May 26, 2010, Chiba, Japan.

- Durrheim, R.J., H. Ogasawara, M. Nakatani, Y. Yabe, A.M. Milev, A. Cichowicz, H. Kawakata, H. Moriya, and the SATREPS research group, Observational studies to mitigate seismic risks in mines: a new Japanese - South African collaborative research project, The proceedings of the fifth International Seminar on Deep and High Stress Mining, 6-8 October 2010, Santiago, Chile.
- Ogasawara, H., M. Nakatani, Y. Yabe, H. Kawakata and SATREPS Research Group, Fault instability monitoring at South African mines, ISS Mini Seminar at Western Levels, South Africa, 19 November 2010, Western Levels, South Africa.
- Milev, A.M., Yabe, Y., Naoi, M., Nakatani, M., Durrheim, R.J., Ogasawara, H., Scholz, C.H., Coseismic and aseismic deformations of the rock mass around deep level mining in South Africa - Joint South African and Japanese study, Abstracts S34B-05 presented at 2010 Fall Meeting, American Geophysical Union, 13-17 December 2010, San Francisco, USA.
- Ogasawara, H., R. Durrheim, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, O. Murakami, M. Naoi, H. Moriya, T. Satoh, Research Group, Semi-controlled earthquake-generation experiments in South African gold mines (2010), ABSTRACTS, Japan Geoscience Union Meeting 2011, SSS029-07, May 23, 2010, Chiba, Japan.
- Ogasawara, H., Monitoring of Stress Build-up and Instability on Faults, Institute of Mine Seismology, 2011 Seminar on the future of monitoring seismic rock mass response to mining, 23 May 2011, Hermanus, South Africa.
- Ogasawara, H., Multidisciplinary monitoring of flooding induced seismicity in Japan and what we can do in South Africa, Council for Geoscience 4th Annual Seismology Workshop on Fluid-induced seismicity, 16 August 2011, Council for Geoscience, Pretoria, South Africa.
- Ogasawara, H., R. Durrheim, M. Nakatani, Y. Yabe, A. Milev, A. Cichowicz, H. Kawakata, O. Murakami, M. Naoi, H. Moriya, T. Satoh, SATREPS research group. Observational studies of earthquake preparation and generation to mitigate seismic risks in mines, International Union of Geodesy and Geophysics, 3 July 2011, Melbourne, Australia.
- Kawakata, H., N. Yoshimitsu, M. Nakatani, J. Philipp, I. Doi, M. Naoi, T. Ward, G. Morema, V. Visser, S. Khambule, T. Masakale, A. Milev, R. Durrheim, L. Ribeiro, M. Ward, H. Ogasawara, Monitoring transmitted waves across a fault with a high potential for mining induced earthquakes – the Ezulwini gold mine in South Africa, Programme and Abstracts, The Seismological Society of Japan, 2011 Fall meeting, D21-08, October 13, 2011, Shizuoka, Japan.
- Ogasawara, H., G. Hofmann, D. Roberts, S. Nakao, H. Kato, Attempts to constrain stress and strength in seismogenic volumes at deep South African gold mines, Programme and Abstracts, The Seismological Society of Japan, 2011 Fall meeting, C22 ~~103~~ October 13, 2011, Shizuoka
- Durrheim, R.J., H. Ogasawara, M. Nakatani, A. Milev, A. Cichowicz, H. Kawakata, Y. Yabe, O. Murakami, M. Naoi, H. Moriya, and T. Satoh,. Observational Studies of Earthquake Preparation and Generation to Mitigate Seismic Risks in Mines, Abstracts S41D-058 presented at 2011 Fall Meeting, American Geophysical Union December 2011, San Fransisco, USA.

Durrheim, R.J., H. Ogasawara, M. Nakatani, Y. Yabe, A.M. Milev, A. Cichowicz, H. Kawakata, O. Murakami, M. Naoi, N. Yoshimitsu, and T. Kgarume, Establishment of SATREPS experimental sites in South African gold mines to monitor phenomena associated with earthquake nucleation and rupture, Sixth International Seminar on Deep and High Stress Mining 2012, 9:00, 30 March 2012, Perth, Australia.

Ogasawara, H., H. Kato, G. Hofmann, P. de Bruin, A modified CCBO technique optimised for regular geological drilling procedures in South African gold mines, Australian Centre for Geomechanics Stress Measurement Workshop, 31 March 2012, Perth, Australia.

2.3 Posters presented at scientific meetings (International 3, Japanese domestic 7)

Naoi, M., M. Nakatani, G. Kwiatek, K. Plenkers, Y. Yabe, Aftershock activity of a M2 earthquake in a deep South African gold mine – spatial distribution and magnitude-frequency relation – American Geophysical Union Fall Meeting 2009, Dec. 15, 2009, San Francisco, USA.

Watanabe, T., M. Naoi, Y. Yabe, M. Nakatani, JAGUARS (Japanese-German Underground Acoustic Emission Research in South Africa), Relocation of AE hypocenters before an M2.1 earthquake in a South African deep gold mine (2), Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, P1-65, October 21, 2009, Kyoto, Japan.

Katsura, T., H. Ogasawara, G. Yasutake, H. Kawakata, A. Yamamoto, M. Nakatani, M. Naoi, Y. Yabe, H. Ishii, E. Pinder, G. Morema, JAGUARS, The M~2 events on the mode II edges of M2 fault and strain changes monitored with close two strainmeters, Mponeng mine, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, P1-66, October 21, 2009, Kyoto, Japan.

Wada, N., M. Nakatani, Y. Yabe, M. Naoi, K. Miyakawa, H. Ogasawara, H. Kawakata, G. Yasutake, N. Yoshimitsu, H. Miyake, S. Ide, T. Igarashi, G. Morema, E. Pinder, Near-field 3D array observation of high-frequency sampling in an M2 hypocenter region at a gold mine in South Africa, Programme and Abstracts, The Seismological Society of Japan, 2009 Fall meeting, P3-45, October 21, 2009, Kyoto, Japan.

Wada, N., H. Ogasawara, H. Kawakata, M. Nakatani, Y. Yabe, M. Naoi, K. Miyakawa, G. Yasutake, N. Yoshimitsu, H. Miyake, S. Ide, T. Igarashi, G. Morema, E. Pinder, The measurement of stress drops for $-3 < M < 0$ earthquakes recorded within 200 meters from the sources with 48 kHz sampling, ABSTRACTS, Japan Geoscience Union Meeting 2010, SSS011-P05, May 26, 2010, Chiba, Japan.

Katsura, T. H. Ogasawara, H. Kawakata, M. Nakatani, M. Naoi, Y. Yabe, G. Yasutake, A. Yamamoto, H. Ishii, E. Pinder, G. Morema, JAGUARS, The focal mechanisms and log-term stress changes of the M~2 events within 100m from two strainmeters, Mponeng mine, Programme and Abstracts, The Seismological Society of Japan, 2010 Fall meeting, P3-33, October 29, 2010, Hiroshima, Japan.

Wada, N., H. Kawakata, O. Murakami, H. Ogasawara, I. Doi, M. Nakatani, Y. Yabe, M. Naoi, K. Miyakawa, N. Yoshimitsu, H. Miyake, S. Ide, T. Igarashi, G. Morema, E. Pinder, Estimating corner frequencies for ultra-micro earthquakes ($-3 < M < -1$) with code wave spectral ratios, Programme and Abstracts, The Seismological Society of Japan, 2010 Fall meeting, P3-34, October 29, 2010, Hiroshima, Japan.

Yoshimitsu, N., H. Kawakata, M. Nakatani, J. Philipp, M. Naoi, I. Doi, T. Ward, V. Visser, G. Morema, S. Khambule, T. Masakale, A. Milev, R. J. Durrheim, L. Ribeiro, M. Ward, H. Ogasawara, Comparison between the Green's function from cross correlation of ambient noise and transmitted wave in a South African deep gold mine, Programme and Abstracts, The Seismological Society of Japan, 2011 Fall meeting, P2
-57- 57, October 13, 2011, Shizuoka

Kawakata, H., N. Yoshimitsu, M. Nakatani, J. Philipp, I. Doi, M. Naoi, T. Ward, V. Visser, G. Morema, S. Khambule, T. Masakale, A. Milev, R. J. Durrheim, L. Ribeiro, M. Ward, and H. Ogasawara, Monitoring transmitted waves across a fault with a high potential for mining induced earthquakes –the Ezulwini gold mine in South Africa, Abstracts S31C-2257, 2011 Fall Meeting, American Geophysical Union, 7 December 2011, San Francisco, USA

Wada, N., H. Kawakata, O. Murakami, I. Doi, N. Yoshimitsu, M. Nakatani, Y. Yabe, M. Naoi, K. Miyakawa, H. Miyake, S. Ide, T. Igarashi, G. Morema, E. Pinder, and H. Ogasawara, Scaling relationship between corner frequencies and seismic moments of ultra micro earthquakes estimated with coda-wave spectral ratio –the Mponeng mine in South Africa, Abstracts S41B-2190, 2011 Fall Meeting, American Geophysical Union, 8 December 2011, San Francisco.

3. News Papers

31 October 2009, Yomiuri News Paper “Collaborative Prediction research with South Africa”.

12 January 2010, Tokyo News Paper, “Exhume Earthquake”.

2 April 2010, Mining Weekly.com, "South Africa, Japan collaborate on seismic event studies",

<http://www.miningweekly.com/article/south-africa-japan-collaborate-on-seismic-events-studies-2010-04-02>

22 November 2010, Yomiuri News Paper, “Science Monday: approaching the proximity of earthquake source faults at a depth greater than 3000m, monitor mine tremors in South African mines”

18 February 2011, Mining Weekly.com, "South Africa, Japan collaborate on seismic event studies",

<http://www.miningweekly.com/print-version/south-african-researchers-agree-that-seismic-events-are-unpredictable-but-technology-can-mitigate-effects-2011-02-18>

4. TV

10 January 2010, NHK (Japan Broadcasting Association) Special “Megaquake Series 1: Catch the next great earthquake! An ever-lasting challenge of human being” . Mponeng mine blasting induce earthquake was used in opening.

27 January 2010, NHK, “Good morning Western Japan “Approach to the mechanism of great earthquakes”

11 September 2010, Chubu-Nihon Broadcasting Corporation, Ezulwini mine research activity was broadcasted in a program “imminent catastrophe”

5. Web pages and others

6 August 2010, Ritsumeikan University Headline News, “Prof. Ogasawara started a observational project for earthquake prediction, collaborating with South Africa”,
http://www.ritsumei.jp/news/detail_j/topics/6508/year/2010.

20-22 September 2010. Ogasawara, H., R. Durrheim and the research group for SATREPS, Observational studies to mitigate seismic risks in mines, a poster presented at OECD Global Science Forum "Workshop on Opportunities, Challenges and Good Practices in International Research Cooperation between Developed and Developing Countries", Pretoria, South Africa.

8 February 2012, Minister Okaniwa (Japanese Embassy) introduced the SATREPS project at Mining INDABA.