



FY2015 Annual Report

International Group,

Crustal Dynamics

Unified understanding of intra-island deformation
after the great Tohoku-oki earthquake

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Index

Index	1
Dispatch of Ogawa	2
Dispatch of Iio et al.	5

Dispatch of Ogawa, Y.

Personnel supported:

Ogawa, Y. (B03, Tokyo Institute of Technology)

Cooperative institutes / researchers:

GNS science

Period: Feb. 16 – Mar. 1, 2016

Area: The east coast of North Island of New Zealand near Gisborne

Purpose:

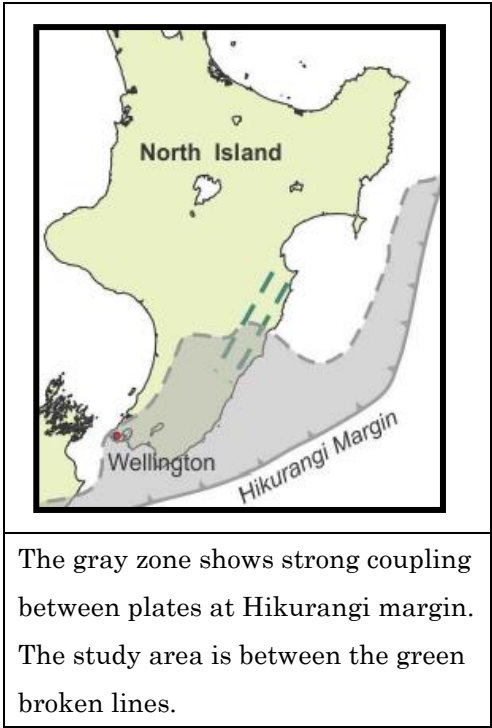
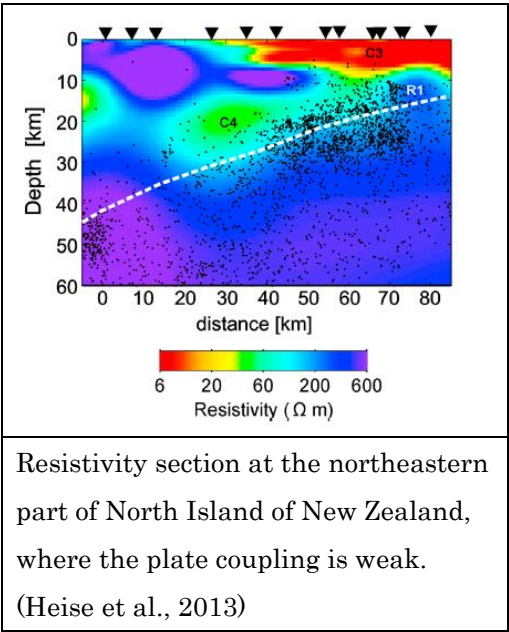
To conduct electromagnetic observations for clarifying the relation between distributions of electro-resistivity and inter-plate friction in a subduction zone.

Report of International Dispatch (Feb. 16 – Mar. 1, 2016)
of Ogawa, Y. (B03, Tokyo Institute of Technology)

I have been collaboration with colleagues with GNS science, on various tectonic problems with involve “fluids”, by use of electromagnetic imaging method. In the past, we have had joint program in imaging fluids and magma across the Taupo volcanic zones, North Island new Zealand, in 2d and 3d modeling (Ogawa et al., 1999; Heise et al., 2007). We also had publications on the resistivity structure underlying the strike slip fault system in South island, where we found multiple fluid reservoirs underlying strike-slip faults below the brittle-ductile transition zone, which is supplied from the dehydration of the subducting slab (Wannamaker et al., 2009). Recently we are making joint study on the coupling of the subducting slab. As our initial result, in the northeastern part of the North Island, we successfully imaged a dipping conductor above the subducting Pacific plate at the east coast of North Island of New Zealand near Gisborne, where plates are weakly coupled (Heise et al., 2013). On the other hand, magnetotelluric profiling at the southern part of North Island, where plates are strongly coupled, we had no such conductors at the plate interface (Heise et al., 2013). Then we have come up with a hypothesis that the fluids at the plate interface may control the mechanical coupling of plates. During my stay in New Zealand, we had some magnetotelluric measurement at the east coast of New Zealand where plate coupling is gradually changing. We also had fruitful discussions on how to organize the project in the future.

References

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Personnel supported:

Iio, Y., (B03, Kyoto University)
Tsuda, H. (Kyoto University)
Matsumoto, S. (B01, Kyushu University)
Nakamoto, M. (Kyushu University)
Okada T. (A01, Tohoku University)

Cooperative institutes / researchers:

Sibson, R. H. (University of Otago)

Period: Mar. 16 – Mar. 26, 2016

Area: New Zealand

Purposes:

To install seismic stations in the northern part of South Island of New Zealand and attend the research meeting with researchers of related organizations to discuss the stress field in the earth crust, together with Prof. Sibson, a professor emeritus at University of Otago, and others, etc.

Report of International Dispatch (Mar. 16 – Mar. 26, 2016)
of Iio, Y. (B03, Kyoto University) et al.

Y. Iio (B03), S. Matsumoto (B01), T. Okada (A01), M. Nakamoto (PD in Kyusyu Univ.) visited New Zealand from mid to late March, 2016, to make discussions with Prof. R. H. Sibson (Univ. of Otago) and other researchers. In Victoria University of Wellington (VUW), we discussed the stress field in New Zealand with Prof. J. Townend. New outcomes in various seismological projects in VUW and students' activities were introduced in the discussion including 6 presentations by graduate students in VUW. We introduced new results obtained by a dense seismic network we implemented in the northern part of the South Island, and discussed future collaborations. In Institute of Geological and Nuclear Science (GNS), we discussed new results on observation with the dense network and subducting plate interfaces with Ph.D. S. Bannister and Ph.D. G. Caldwell. We introduced the “0.1 manten seismic observation”, which is planned for the FY2017 in Crustal Dynamics, and discussed potential fields for collaborative projects. We went on a field trip to an active fault guided by Prof. Sibson, and learned about active faults and development of related sciences.

