

Long-term temporal change in crustal resistivity beneath western Shikoku

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In southwest Japan, various slow earthquakes such as deep low-frequency tremor and short/long-term slow slip events occur at the subducting plate interface (e.g. Obara and Kato, 2016, *Science*). In western Shikoku, Magneto-telluric (MT) survey was carried out along the dip direction of subducting Philippine Sea plate. The survey revealed an existence of low-resistivity structure in the lower crust in this region (Yamashita and Obara, 2009, AGU). In order to investigate a relationship between this characteristic structure and the activity of slow earthquakes, NIED has been carrying out continuous MT observations in western Shikoku since 2008. Here we show the observational records over 10 years and then discuss a relationship between observed temporal change in crustal resistivity and activity of the long-term slow slip event (L-SSE). Two observational sites KBN and IKT are available as of 2019. Qualities of data recorded at these sites are relatively fine. However, in order to improve the quality for discussing subtle change in MT parameters, we apply a data processing method same as Honkura *et al.* (2013, *Nature comm.*); we use only data whose coherency between electric and magnetic field is higher than a threshold. The lowest frequency of processed data is 0.00028 Hz. The processed MT parameters, apparent resistivity and phase, do not show any long-term temporal changes at KBN site even after temporal stops of observation over some months. On the other hand, apparent resistivity at IKT site, which is around 10 km southwest away from KBN site, shows temporal reduction at a frequency lower than 0.0022 Hz between 2010 and the middle of 2012. It is known that L-SSE occurred beneath the Bungo Channel in 2010 (e.g. Yoshioka *et al.*, 2015, *GJI*), which could induce resistivity change in the lower crust and then it might be detected by our MT observation.

Keywords: Crustal resistivity, Long-term slow slip event, Magneto-telluric method