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Seismicity and stress/strain changes in central Japan after the 2011 off the Pacific coast of Tohoku Earthquake

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The 2011 off the Pacific coast of Tohoku Earthquake (M 9.0) occurred at 14:46 of March 11, 2011 (JST). Seismicity, including tremor activity, has been activated worldwide after this 2011 Tohoku Earthquake. In this study, we focused on seismicity change in central Japan, mainly before and after the 2011 Tohoku earthquake. And then we infer stress and strain change from seismicity rate change and compare them with ones from other analyses (e.g. GPS observation).

It is considered that Seismicity is very sensitive to stressing rate change related with them. Seismicity can be used as remote-sensing stress meter, as suggested by Dieterich et al. [2000] and Dieterich [1994]. Through investigating seismicity change, we want to understand stressing rate change in central Japan and relationship between spatio-temporal variations of seismicity and strain rate.

We use the Japan Meteorological Agency (JMA) unified earthquake catalog to calculate seismicity rate change. As a magnitude threshold to make a complete earthquake catalog from JMA catalog, we use a value of 1.5. Using this magnitude threshold and focal depths, we have selected earthquake catalog occurred in crust. We have calculated spatio-temporal variations of seismicity rate. And also, we have calculated Z-value, b-value, and related parameters using software "ZMAP". Calculations have gone on to increase a number of earthquakes and to include ones occurred in recent days as possible.

We report spatio-temporal variation of seismicity, seismicity rate changes and stressing rate changes inferred from them, strain rate differences inferred from GPS before and after the 2011 Tohoku Earthquake. And also, we show some results related on the 2011 Tohoku Earthquake.

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Keywords: seismicity, seismicity rate change, stress/strain change, z-value, b-value