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Seismic quiescence and activation induced by a long-term slow slip event in the Bungo channel area during 2002-2004

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Katsumata(2010) presented a slow-slip-event (SSE) model to explain the precursory seismic quiescence lasting five years before the 2003 Tokachi-oki earthquake ($M_w=8.3$). The purpose of this study is to show an example of the seismic quiescence and/or activation caused by a long-term SSE. A long-term SSE in the Bungo channel area in the southwestern Honshu, Japan, occurred during 2002-2004 (e.g., Hirose and Obara, 2005; Ozawa et al., 2007). I investigate the seismicity in the Bungo channel area by using an earthquake catalog compiled by the Japan Meteorological Agency: time period is from 1 January 1998 to 31 December 2007, latitudes are from 31N to 35N, longitudes are from 130E to 135E, depths are from 30 to 100 km, and $M \geq 2.0$. The number of earthquakes are 3216 and I apply ZMAP (Wiemer and Wyss, 1994) to these earthquakes. The grid spacing is 0.05 degree, the N=100 earthquakes are selected around each grid point, and the length of time window is two years. As a result, I find a seismic quiescence within a circle centered at (33.55N, 132.85E) with a radius of 35 km, which is characterized by $Z=+5.2$, and starting in April 2002. I also find a seismic activation within a circle centered at (33.30N, 132.15E) with a radius of 13 km, which is characterized by $Z=-3.2$, starting in November 2002. The seismic quiescence and activation start at the same time as the Bungo channel SSE. The seismic quiescence and activation areas are very close to the area of the Bungo channel SSE. Therefore I suggest that the seismic quiescence and activation found in this study are induced by the Bungo channel SSE lasting from 2002 to 2004.

Katsumata, K (2010), Precursory seismic quiescence before the $M_w=8.3$ Tokachi-oki, Japan earthquake on 26 September 2003 revealed by a re-examined earthquake catalog, *J. Geophys. Res.*, in print.

Hirose and Obara (2005), *Earth Planets Space*, 57, 961-972.

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Wiemer and Wyss (1994), *Bull. Seism. Soc. Am.*, 84, 900-916.

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