

SSS027-05

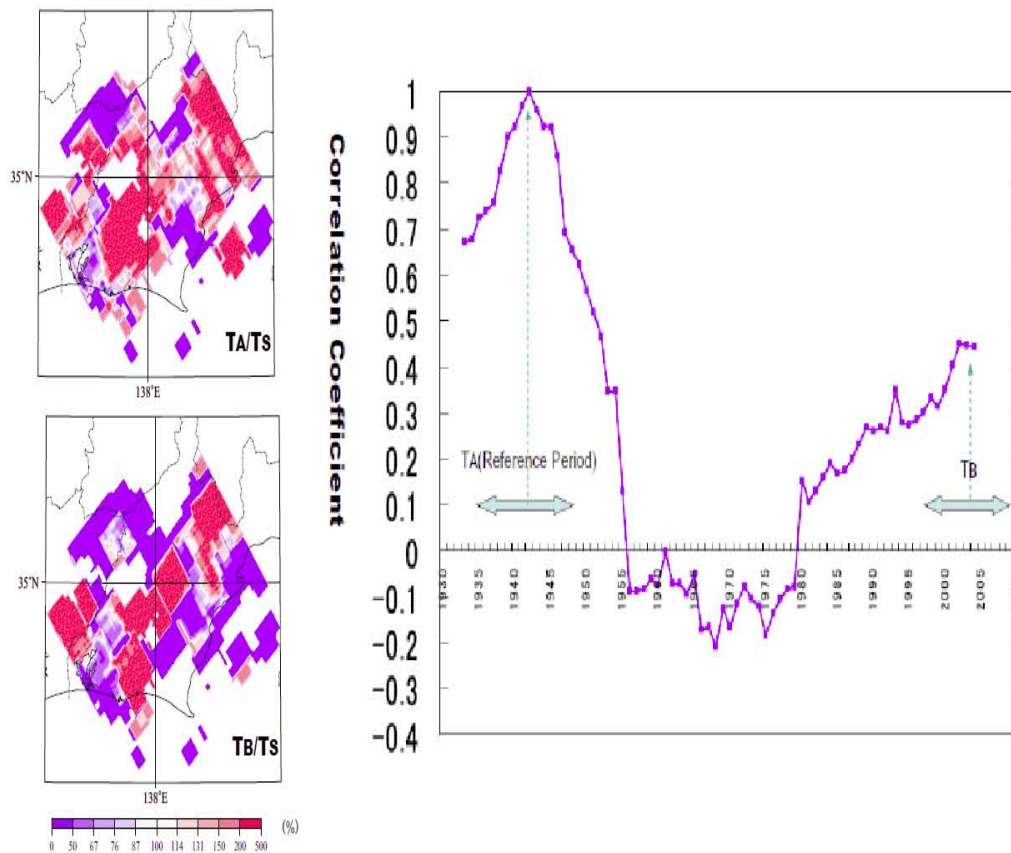
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Reappearance of seismicity change pattern in the Tokai region leaving 60 years interval since the Tonankai earthquake

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I tried to monitor a long-term change of seismicity in the Tokai region by drawing activity rate maps and comparing them between each other. Utilizing the JMA catalog, I extracted earthquakes of M3.5 and greater, and shallower than 60km in the inferred seismogenic zone of the next Tokai earthquake. The duration of the catalog is about 90 years from 1923 till the present. From the cumulative frequency of the earthquakes, I found two active periods of TA(1935-1948) and TB(1997-present). The procedure how to analyze the seismicity change is as follows.

First, each activity rate in TA or TB is compared to that in the standard period TS(1949-1996), and a map of change pattern is drawn as in the attached figures, where red (blue) indicates activation (quiescence). It is recognized that both patterns seem very similar between each other. The seismicity change is considered to reflect stress redistribution such as stress concentration in the red area, or release in the blue area. Therefore, the similarity in the seismicity change pattern between TA and TB implies that a common change in the stress state progressed in each of both periods. I calculated a correlation coefficient between the patterns of TA and TB, and obtained $r=0.44$ with a statistical significant level of 1%. Next, I also drew each activity rate map by moving the time window (14 years) year by year, and calculated the correlation coefficient with setting TA as the reference period. The right figure shows the temporal change of the coefficients. It is revealed that the similarity with the reference reappeared first at present after 60 years interval. In conclusion, I propose the following assumption. The stress state at present (TB) is very similar to that in the period before and after the Tonankai earthquake (TA). The present state is considered to be created through the recent long-term slow slip beneath the Hamana lake. It is inferred that a long-term slow slip with the same magnitude as the present one had progressed also in the period of TA.