

## Characteristics of the past M7 earthquakes at the western Kanagawa prefecture, Japan

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We investigate the characteristics of the past intermittent M7 earthquakes at the western Kanagawa prefecture, Japan, (hereafter, WKEs), using reliable data of the historical large seismic events those of which damaged the western Kanagawa prefecture.

The following earthquakes are estimated to be the past WKEs or related events, based on Chronological Scientific Tables (2000 ed. by Maruzen Co. Ltd.) for events before 1920 and on JMA hypocenter data file (JMA, 2002) for events after 1921.

- 1) 1633/3/1 'Kan-ai WKE' with M7.0 at 35.2N and 139.2E
- 2) 1703/12/31 '1703 Genroku earthquake' with the total M of 7.9 ~8.2 at 34.7N and 139.8E
- 3) 1782/8/13 'Tenmei WKE' (with M7) at 35.4N and 139.1E
- 4) 1853/3/11 'Kaei WKE' with M6.7 at 35.3N and 139.15E
- 4') 1870/5/12 Moderate-size earthquake (with M6 ~6.5) at 35.25N and 139.1E
- 5) 1923/9/1 '1923 Kanto earthquake' with the total M of 7.9 (or 8.1; Takemura et al., 2000) at 35.3N and 139.1E (or 35.35N and 139.15E; Hamada, 1987)
- 5') 1924/1/15 Aftershock with M7.3 (or M7.1; Takemura et al., 2000) of the 1923 Kanto earthquake at 35.3N and 139.1E (or 35.5N and 139.2E; Utsu, 1982)

So far several tectonic models, concerning the past WKEs, have been proposed by Ishibashi (1985), Kasahara (1985) and others.

We, for example, tested a simple model of the stochastic differential equation analysis for an intermittent sequence of the past WKEs, using the time-predictable model of Shimazaki and Nakata (1980).

Assuming that major zone of the asperity located at the western Kanagawa prefecture slipped commonly during the previous WKEs and a WKE with M of 7.0-7.3 was included within the rupture process of the 1923 Kanto earthquake on Sep. 1, 1923, we obtained high probability of the next WKE occurrence during the first half of this century.

But, if the M7 event at the western Kanagawa prefecture on Jan. 15, 1924 ruptured again, to some extent, the asperity zone of the M7 WKE during the 1923 Kanto earthquake, the outbreak of the next WKE will be postponed for tens of years more.

To estimate precisely the period to the next WKE, we need further investigation to reveal more detailed seismological characteristics of the past WKEs and their tectonic background, etc.

Also, we need sophisticated researches on lithosphere dynamics at the northern end zone of the Philippine sea plate near Izu peninsula, which is not a zone of a simple oceanic plate but of a block covered with a volcanic island arc type crust. This tectonic feature is one of the reason why complicated internal lithospheric deformation has been progressing at the western Kanagawa prefecture.