

Offshore rupture area of the 1703 Genroku earthquake inferred from tsunami heights from historical documents

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The 1703 Genroku Kanto earthquake occurred on a boundary between the Philippine Sea plate and the North American plate. The coseismic coastal vertical movements have reported along the coast from the Sagami Bay to the Boso Peninsula. Therefore, the onshore region is partially covered with its rupture area. However, there are no data of rupture area in the offshore area. Since the rupture area estimated from the onshore indicators cannot explain tsunami heights along the Boso coast, it possibly extends offshore area.

We carried out tsunami computations from two fault models. One is with the offshore rupture area (Model C), and the other is without the offshore rupture area (Model A). Around the Kujukuri beach, near the source, we have already reported that Model C is preferred to explain the tsunami inundation area estimated from locations of monuments, which are indicators of the tsunami inundation area (Namegaya et al., 2008, AGU). In this study, we compared the computed tsunami heights with the observed ones from Atami, Shizuoka Prefecture, to Taiji, Wakayama Prefecture, which are located in the western part of the source area, and far from the source. In this area, the tsunami heights are estimated, or observed, to be 3-5 m along the eastern coasts of Izu and Kii Peninsulas from historical documents (e.g. Hatori, 1973; Tsuji, 1981). As a result, the computed tsunami heights from Model C are slightly larger than those from Model A, and also smaller than the observed heights. This indicates that the observed heights along the eastern coasts of the Izu and Kii Peninsulas supports the previous result based on near-source tsunami heights, while the slip amount and/or location of the offshore fault should be considered more precisely.