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The strong motion and tsunami by lining occurrence of the Nankai-Trough earthquake -"Worst" scenario by -3 linkage occur

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1. Source model for the 1707 Hoei earthquake
The Hoei earthquake which occurred in 1707 was the greatest inter-plate megathrust earthquake occurred in the Nankai Trough in which three earthquakes of the Nankai, Tonankai, and the Tokai simultaneous generating. The source area of this event is considered to extend more than 600 km from Cape Ashizuri of the Tosa bay to the Suruga bay. However this model cannot explain well tsunami height more than 10 m that struck around Cape Ashizuri, and about 2-4-m tsunami height at the coast of Oita. Furumura and Imai (2009) claimed that the source area for the Hoei earthquake must be extended to west to Huga Nada for 70 km following the results of new finding of tsunami deposits at Ryujin Pond at Oita recently investigated by Okamura (2006) Chida and Senda Nakayama (2006). The GPS observation network (GEONET) demonstrates upheaval of 25 mm have been continued in the past ten years in the area of the Ryujin Pond but the tsunami pond do to exist for more than several hundred years. Thus, it is necessary to consider that the area was subsides more than 60 cm during the 2707 Hoei earthquake. The new Hoei source model was constructed based on the study of the inter-plate coupling by the analysis of GPS data (Hashimoto, Sagiya, and Matsuura 2008; Nishimura 1999). The new model can explain the tsunami height of Hyuga Nada well and subsidence due to the earthquake in the area around the Ryujin pond.

2. The worst scenario by 3 linkage earthquake occurrence
The Ansei Nankai earthquake in 1854 has occurred 30 hours after the occurrence of the Tokai earthquake. It has long been argued about a possibility that the Nankai and the Tokai earthquake fault segment vacated the time for about ten minutes, during the Hoei earthquake (Usami 2003; Imai, Satake, and Furumura 2008). If the following earthquake occurs at the place after several ten minutes have passed since the previous event, superposition of tsunami amplifies tsunami height in wide area (e.g., Imai et al. 2009; Kawada et al. 2003). Furthermore, slow rupture on the fault produces the directivity effect which also causes superposition of tsunami in the direction of fault rupture propagation. For example, assuming a sea depth of 2000 m deep and then tsunami wave speed is 140 m/s, when fault rupture speed meets this speed the tsunami generated by the earthquake gathers at the tip of the rupturing fault, developing tall tsunami. Therefore, the evaluation of the source dislocation style (rupture direction and speed) destructive sound wave velocity, the destructive direction) and the type of linkage occurrence of the Nankai Trough earthquake is very important for mitigate possible disasters expecting for future earthquake.

Keywords: Nankai Trough, Earthquake, Tsunami