Long-term Probability of the Kanto M8 Class Earthquake along the Sagami Trough, Central Japan

*Masajiro Imoto[1], Nobuyuki Morikawa[1], Hiroyuki Fujiwara[1]

1.National Research Institute for Earth Science and Disaster Prevention

We discuss the uncertainty of the long-term probability of the Kanto M8 earthquake along the Sagami trough, central Japan, which has been reported by the Earthquake Research Committee, the Government of Japan. First, we propose a Bayesian method to use a prior distribution consistent with a historical sequence in estimating the probability based on earthquake sequences to match geological and geomorphological evidences, where origin times of nine paleoearthquakes are given with large uncertainties. Next, we examine earthquake sequences generated with the Poisson distribution. Results suggest that the epistemic uncertainty of the Meio Kanto earthquake leads to an uncertainty of 0.7% to 5.3% for 30 yr probability, where the Poisson distribution becomes more likely than the Brownian passage time distribution in the case of the Meio earthquake being one of Kanto M8 earthquakes. Finally, we discuss on the frequency distribution of inter event times in the simulated sequences. It is a notable feature that a histogram of the inter event times exhibits a bimodal distribution. This feature is explained by the evidence that the peak at the longer interval consists of the former five inter event times and the other peak at the shorter interval does of the later three inter event times. This suggests missing earthquakes in a former part of the paleoearthquake series. Consequently, it is likely that the current long-term probability of the Kanto earthquake is underestimated based on an incomplete earthquake series.