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Long-term probability for large earthquake along the Nankai trough estimated from an incomplete catalog

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The Earthquake Research Committee of Japan published a report (the second edition) on the long-term evaluation for great recurrent earthquake along the Nankai trough in May, 2013 and newly forecasted the probability for such event in coming 30 years to be 60 - 70%. The giant earthquake may be possible, and the report was socially paid attention to very much. In the calculation of probability the BPT, Brownian Passage Time, distribution model is used in which the distribution parameters estimated with the maximum likelihood method or the time predictable model are plug in directly to the formula of conditional probability. Those are estimated from a few data, but not considered about the bias and uncertainty in them.

The committee explained that an earthquake, the Keicho event (1605) may not occur along the Nankai trough and some qualifying earthquakes are probably missed from the current catalog. In this presentation I will introduce a Bayesian new method with non-informative prior distribution to the parameters in a lognormal distribution for calculating the probability for the coming event from an incomplete catalog, and show the result of about 23 % for the event in the forthcoming 30 years along the Nankai trough

Keywords: Nankai trough, recurrent earthquake, forecast, Bayesian approach, incompleteness of catalog