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[EE] Evening Poster | S (Solid Earth Sciences) | S-SS Seismology

## [S-SS06]CSEP, earthquake forecast testing, and the role of SSE in earthquake occurrence.

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The Collaboratory for the Study of Earthquake Predictability (CSEP) has expanded over the years to many different testing areas hosted at multiple testing centers. One of which is the Japan testing center at the University of Tokyo, operated in collaboration with GFZ Potsdam. Hundreds of earthquake forecast models have been submitted to CSEP and are being tested. New testing metrics were developed and implemented and a lot of progress was made to establish CSEP as an institution that cannot be ignored when issuing earthquake forecasts. Its rigor and independence became the standard in evaluating earthquake forecasts and in reporting on the results.

Although the tests CSEP has conducted have been successful and well-received, they have also shown the limitations of the CSEP approach. What is a sufficient testing period for models? Are time-invariant models really describing the long-term seismic activity? Are long-term models testable at all? Do short-term models provide significant information for the forecasting problem or do they only model aftershock sequences? What other signals should be included in forecasting models to improve them? Do improvements in forecasting models translate into improvements of hazard models? Many aspects of seismic hazard or earthquake forecasting remain inherently untestable if only the model forecasts are tested and not the model ingredients. We propose to create new areas of activity for CSEP, namely targeted experiments that cannot be conducted with the current CSEP software system.

We solicit contributions addressing forecasting models, forecast testing problems, new ideas for CSEP experiments, possibilities of further CSEP developments, ways of expanding CSEP into the hazard and risk domain, and more general views on the forecasting problem. This is aimed at fostering the discussion in the community about further goals of earthquake forecasting experiments.

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## [SSS06-P01] A 3D-hypocentral ETAS model for the Japan CSEP project and initial results

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Keywords: 3D ETAS model, CSEP, earthquake probability forecasting

In this study, we present a realization of a 3D-hypocenter ETAS model to fulfil the requirements of models for forecasting seismicity in the Kanto testing region in JAPAN CSEP project, where the focal depth is emphasized. In this model, we assume that the focal depths of earthquakes follow a beta distribution.

We also carry out some retrospective test on the seismicity in the Kanto region and compared the results with a simple 3D Poisson model and an 2D ETAS model with a location dependent depth distribution. The results showed that taking into consideration the correlation of depths between each triggering pair of earthquakes significantly improves our forecasting of seismicity in 3D dimensional and can provide us

real-time or short-term seismicity forecasting with higher resolution, which is indispensable for earthquake hazard mitigation in metropolitan areas like Tokyo.