



Earthquake Forecasting Based on Data Assimilation

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Earthquake forecasting and time dependent earthquake hazard assessment is increasingly being implemented, automated and tested. Within the framework of the Regional Earthquake Likelihood Modeling initiative in Southern California, for example, statistically and physically based models are now forecasting earthquake probabilities. However, initial conditions, parameter estimation, and uncertainty in the observations have not been addressed optimally or rigorously. Data assimilation provides solutions to these problems and is expected to ultimately play a similarly pervasive role as in meteorological forecasting. We report on the first implementation of an earthquake forecasting scheme based on data assimilation. Specifically, we adapt traditional techniques to the challenging characteristics of seismicity: extreme variability, non-continuous point-process-like occurrence and intrinsic stochasticity.