



An application of model uncertainty statistical assessment: a case study of tectonic deformation in the Mediterranean

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We apply the statistical procedure proposed by Barzaghi et al. (2014) to determine model uncertainty for the purpose of classifying different geophysical models that simulate tectonic deformation in the Mediterranean. For each predictive geophysical model, a covariance model is established based on 500 randomly chosen parameter combinations. Using the covariance function, model prediction uncertainty is derived from parameter uncertainties. Velocities predicted through geophysical models have been compared with GPS-derived velocities by means of a χ^2 statistic analysis, and these results are used to classify different models by rheology. The results indicate that including the obtained model covariance within the comparative analysis facilitates the ability to discriminate among geophysical models. When this methodology is applied to analyze the tectonic deformation in the Mediterranean, models that account for granite and granulite composition in the upper and lower crust, respectively, more effectively predict the velocity field of the study area.