



Supplement of

Pseudo-prospective testing of 5-year earthquake forecasts for California using inlabru

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Table S1: Quantile scores for CSEP tests. Upper bounds for S, L and PL-tests, lower bound for M. Bold indicates consistency with observations, italics highlight declustered models.

Time	Models	Gridded					Catalogue				
		N-test (δ_1)	N-test (δ_2)	S-test	M-test	CL-test	N-test (δ_1)	N-test (δ_2)	S-test	M-test	PL-test
2006 - 2011	SRMS	0.465	0.603	0.025	0.288	0.105	0.440	0.625	0.180	0.404	0.268
	<i>SRMSDC</i>	<i>0.002</i>	<i>0.999</i>	<i>0.738</i>	<i>0.290</i>	<i>0.848</i>	<i>0.002</i>	<i>0.999</i>	<i>0.922</i>	<i>0.842</i>	<i>0.006</i>
	FDSRMS	0.463	0.605	0.032	0.289	0.122	0.462	0.606	0.196	0.383	0.305
	<i>FDSRMSDC</i>	<i>0.002</i>	<i>0.999</i>	<i>0.692</i>	<i>0.291</i>	<i>0.818</i>	<i>0.001</i>	<i>0.999</i>	<i>0.891</i>	<i>0.838</i>	<i>0.007</i>
	SRMSNK	0.486	0.583	0.028	0.293	0.115	0.463	0.605	0.243	0.389	0.327
	<i>SRMSNKDC</i>	<i>0.002</i>	<i>0.999</i>	<i>0.711</i>	<i>0.288</i>	<i>0.830</i>	<i>0.002</i>	<i>0.999</i>	<i>0.874</i>	<i>0.833</i>	<i>0.007</i>
2011 - 2016	SRMS	0.999	0	0.039	0.158	0.026	1	0	0.011	0	0.999
	<i>SRMSDC</i>	<i>0.963</i>	<i>0.064</i>	<i>0.766</i>	<i>0.153</i>	<i>0.485</i>	<i>0.952</i>	<i>0.081</i>	<i>0.807</i>	<i>0.037</i>	<i>0.951</i>
	FDSRMS	0.9999	0	0.030	0.155	0.021	1	0	0.011	0	0.999
	<i>FDSRMSDC</i>	<i>0.964</i>	<i>0.063</i>	<i>0.744</i>	<i>0.156</i>	<i>0.467</i>	<i>0.958</i>	<i>0.070</i>	<i>0.883</i>	<i>0.035</i>	<i>0.960</i>
	SRMSNK	0.999	0	0.070	0.157	0.044	0.999	0	0.0132	0	0.9999
	<i>SRMSNKDC</i>	<i>0.960</i>	<i>0.068</i>	<i>0.766</i>	<i>0.158</i>	<i>0.487</i>	<i>0.962</i>	<i>0.063</i>	<i>0.793</i>	<i>0.032</i>	<i>0.959</i>
2016 - 2021	SRMS	0.792	0.264	0	0.369	0.002	0.772	0.283	0.003	0.436	0.312
	<i>SRMSDC</i>	<i>0.029</i>	<i>0.982</i>	<i>0.008</i>	<i>0.368</i>	<i>0.068</i>	<i>0.019</i>	<i>0.989</i>	<i>0.081</i>	<i>0.858</i>	<i>0.005</i>
	FDSRMS	0.791	0.266	0	0.367	0.004	0.795	0.268	0.005	0.398	0.369
	<i>FDSRMSDC</i>	<i>0.030</i>	<i>0.981</i>	<i>0.0068</i>	<i>0.367</i>	<i>0.062</i>	<i>0.025</i>	<i>0.986</i>	<i>0.073</i>	<i>0.850</i>	0.007
	SRMSNK	0.806	0.248	0	0.367	0.006	0.789	0.266	0.006	0.413	0.374
	<i>SRMSNKDC</i>	<i>0.027</i>	<i>0.984</i>	0.005	<i>0.369</i>	<i>0.050</i>	<i>0.027</i>	<i>0.983</i>	<i>0.119</i>	<i>0.849</i>	0.009

1 1984-2004 data results

The training dataset used in the paper covers 1985-2005, but an earlier version used training data from 1984-2004. The results of this earlier testing period are included here for completeness, and the forecasts are included in the available repository in the Forecasts 1984 - 2004 folder. Table 1 shows the results of testing for the 1984-2004 trained forecasts in the three testing periods.

Figure 1 shows the rate differences between catalogue forecasts SRMS generated from the 1984-2004 and 1985-2005 training catalogues. There are 4 events in California ≥ 4.95 in 2005, and the locations of these events versus events from 1984 which are no longer included account for the differences between the two models. This leads to slightly elevated rates in areas with earthquakes in 2005.

Comparing Figure 2 with Figure 8 in the paper and table 1 with Table 2 in the paper, shows that the overall test results are very similar. Changes in score for the spatial, number and pseudo-likelihood tests are all very small - there is only a marginal change in the resulting score in the first testing period and a negligible change in the later testing period. Thus we achieve a very slight improvement to performance by including the 2005 data due to accounting for short-term spatial patterns in the first (2006-2011) testing period.

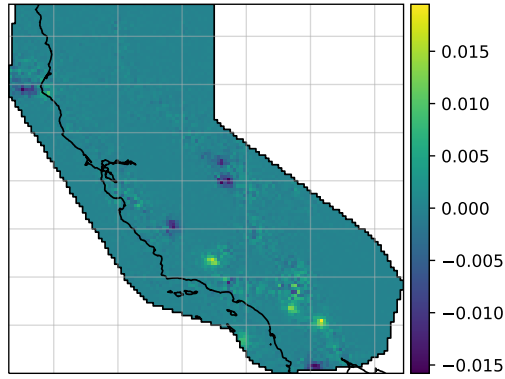


Figure S1: Rate differences for catalogue forecasts SRMS with twenty year testing periods 1984-2004 and 1985-2005

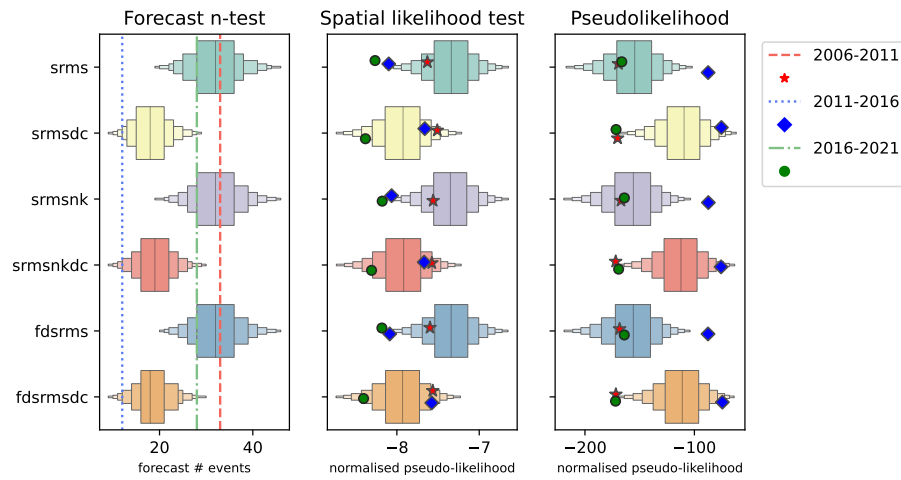


Figure S2: Catalogue forecast results for models with training data 1984-2004 for three testing periods. Models include combinations of smoothed past seismicity (MS), strain rate (SR), fault distance (FD) and fault slip rates (NK).