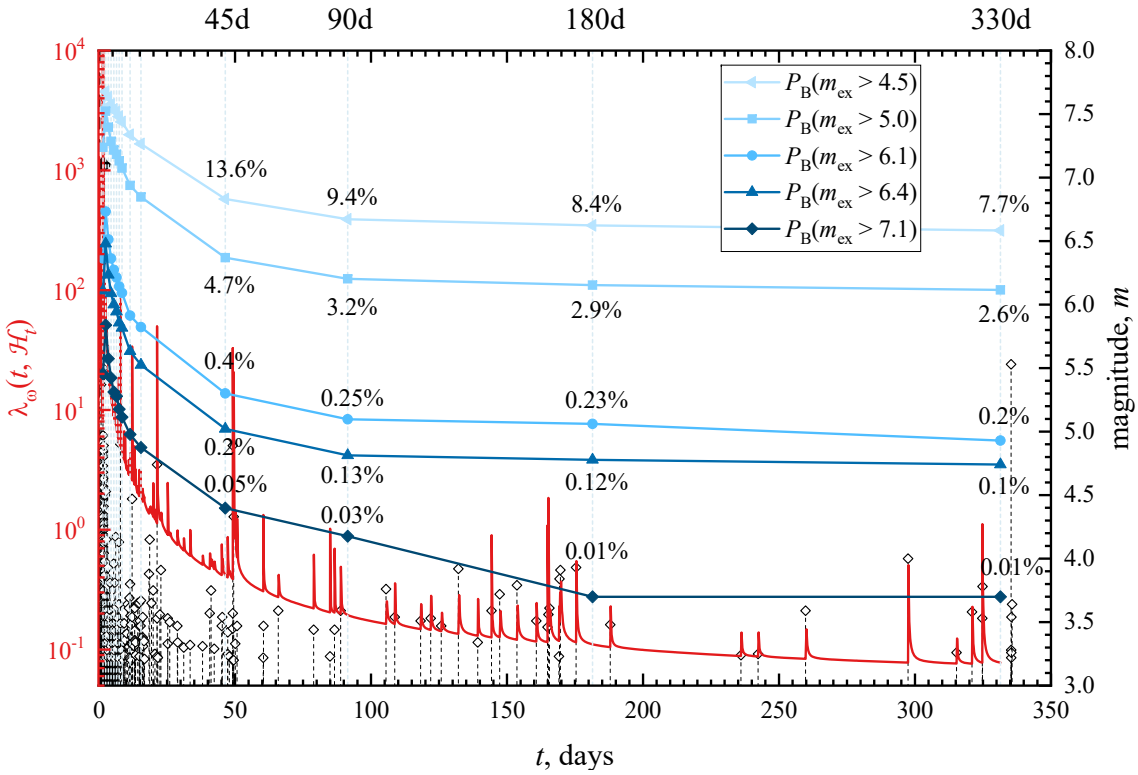

Figure S12. The probabilities for the largest expected earthquake to be above the magnitudes $m_{ex} \geq 4.5$, 5.0, 6.1, 6.4, 7.1 and during the progressively increasing time intervals since 2019/07/04 (17:02:55 UTC). The probabilities are estimated using the BPD combined with the ETAS model for the earthquake rate during the forecasting time interval $\Delta T = 7$ days and plotted in a logarithmic scale. The earthquake magnitudes of the 2019 Ridgecrest sequence are plotted as open diamonds for all events above magnitude $m \geq 3.2$. The fit of the ETAS model is shown as a solid curve.

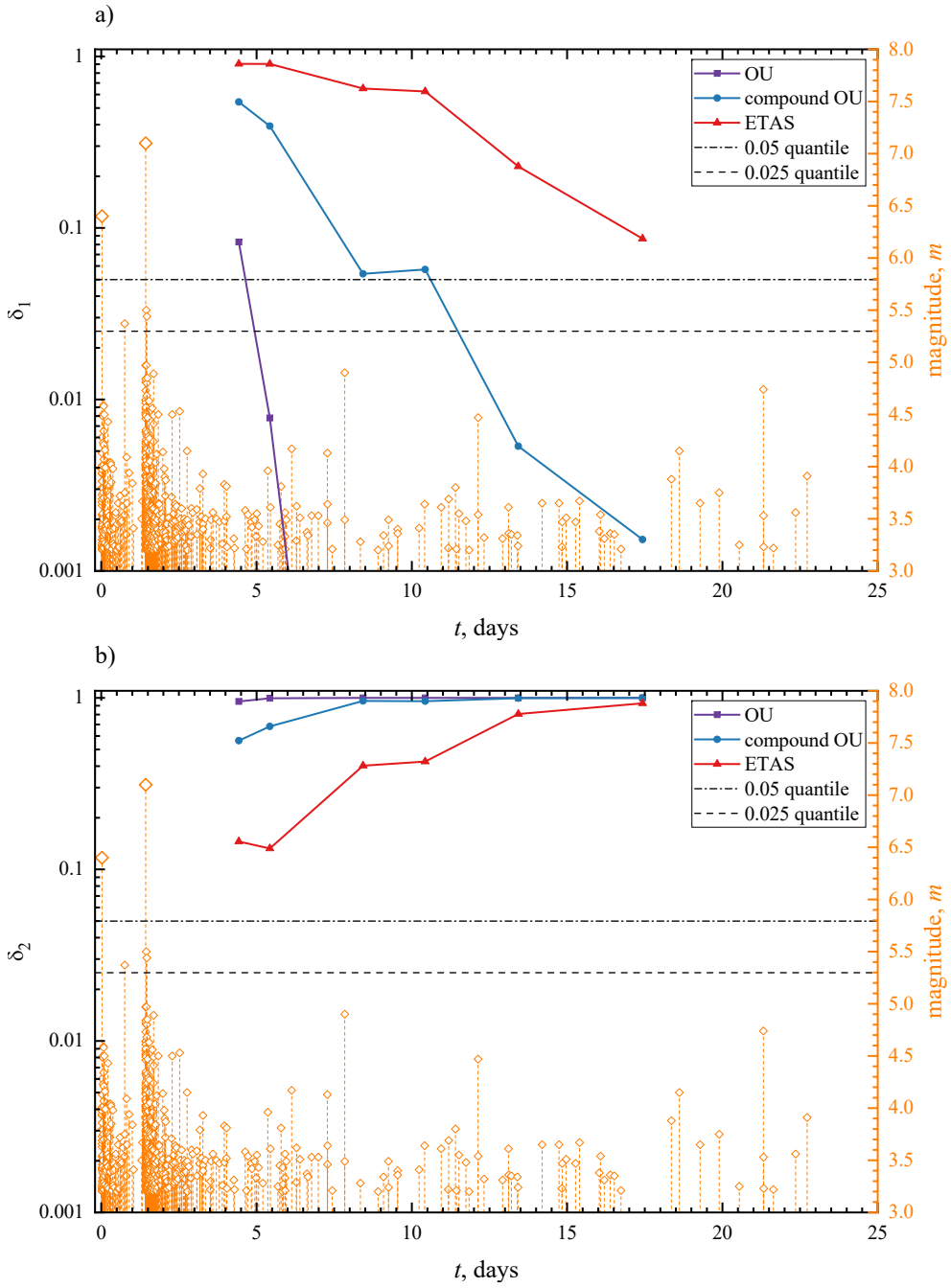

Figure S13. Plot of the quantile scores a) δ_1 (N-test), b) δ_2 (N-test), and c) κ (M-test) for the performance of the aftershock forecasts based on the three point process models. The scores are computed at the end of each forecasting time interval. The end of the training time interval is fixed at $T_e = 3.428$ days while the forecasting time interval is increasing as $\Delta T = 1, 2, 5, 7, 10, 14$.

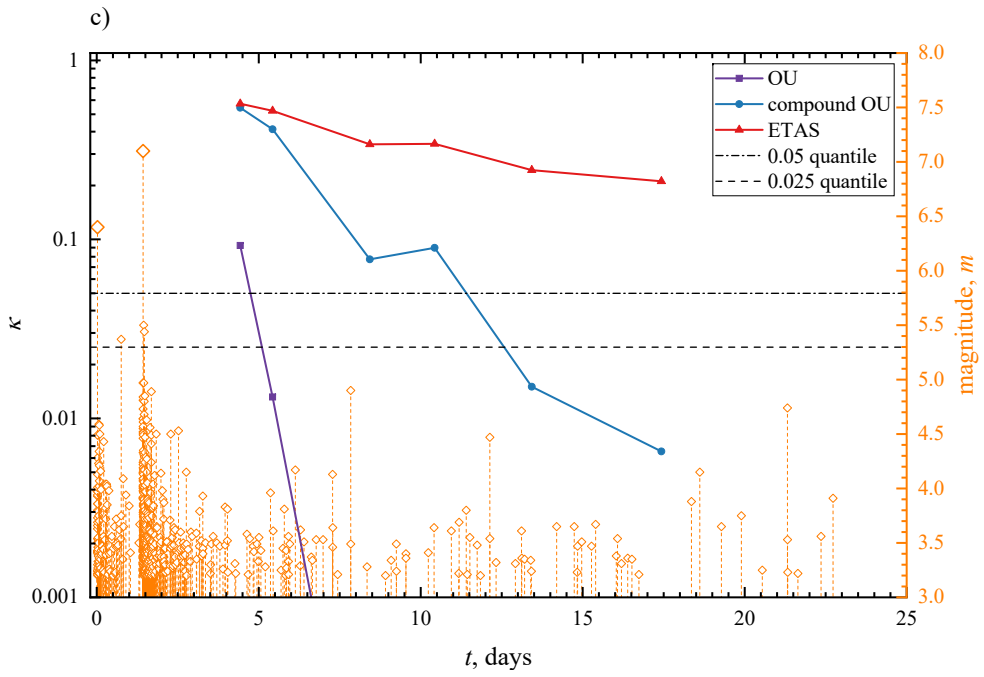

Figure S13. Continued.

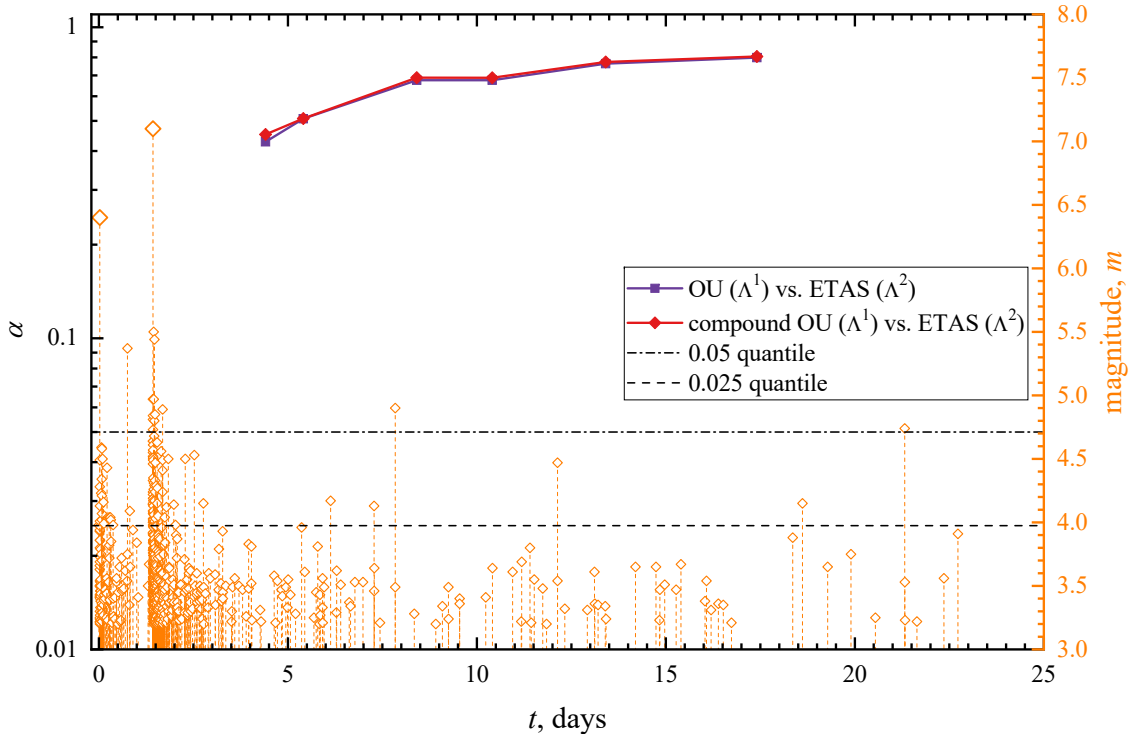

Figure S14. Plot of the quantile score α (R-test) for the comparative test of the ETAS model versus the forecast based on the OU model and on the compound OU model. The scores are computed at the end of each forecasting time interval as in Figure S13.

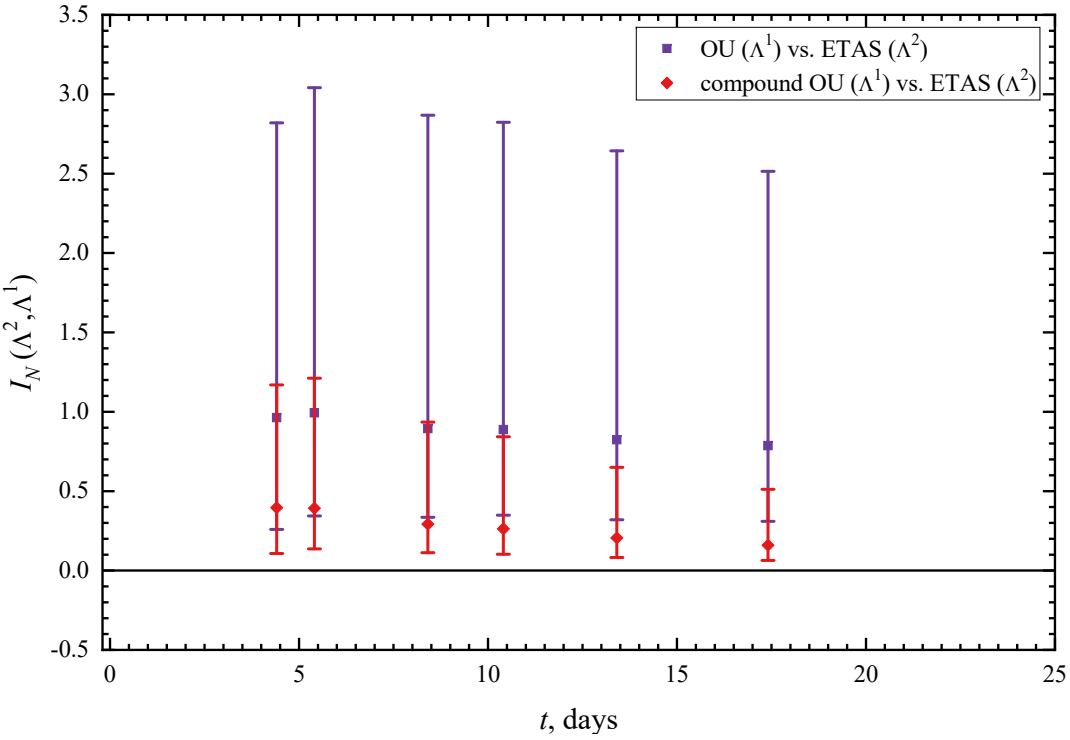

Figure S15. The sample information gain for the pairs of the models. The solid squares correspond to the comparison of the forecasts based on the ETAS model versus the forecasts based on the OU model. The solid diamonds correspond to the comparison of the forecasts based on the ETAS model versus the forecast based on the compound OU model. The 95% confidence intervals are given.

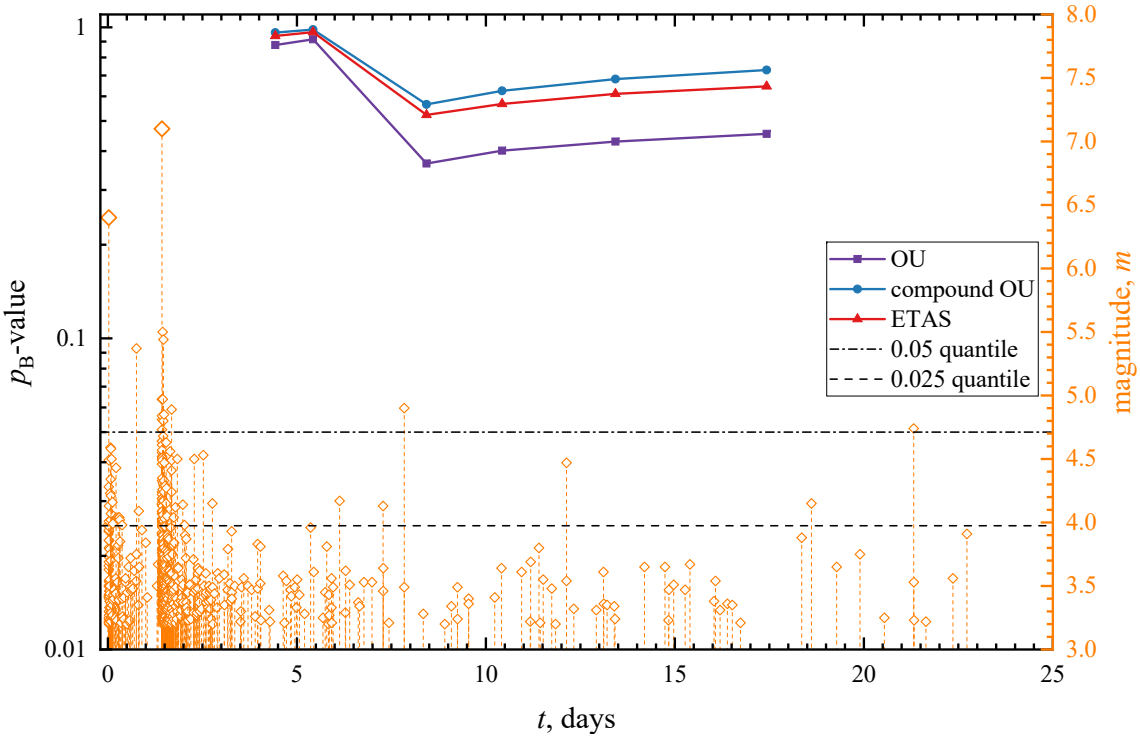

Figure S16. Plot of the Bayesian predictive distribution p-value for the three models. The p-values are computed at the end of each forecasting time interval as in Figure S13.

Tables for the model prior parameters

The Omori-Utsu model

Table S1. Summary of the parameters used for the prior distribution of the OU model $\{\theta, \omega\} = \{\beta, K_o, c_o, p_o\}$. For the priors $\pi(\{\theta, \omega\})$ the Gamma distribution was used with the mean and variance specified for each parameter.

Prior for	β	K_o	c_o	p_o
mean	2.18	40.0	0.05	1.5
Var	0.05	1.0	1e-3	0.05

The compound Omori-Utsu model

Table S2. Summary of the parameters used for the prior distribution of the compound OU model $\{\theta, \omega\} = \{\beta, K_1, c_1, p_1, K_2, c_2, p_2\}$. For the priors $\pi(\{\theta, \omega\})$ the Gamma distribution was used with the mean and variance specified for each parameter.

Prior for	β	K_1	c_1	p_1	K_2	c_2	p_2
mean	2.18	20.3	0.0024	0.96	38.9	0.046	1.63
Var	0.05	1.0	1e-6	0.005	1.0	1e-4	0.01

The Epidemic Type Aftershock Sequence (ETAS) model

Table S3. Summary of the parameters used for the prior distribution of the ETAS model $\{\theta, \omega\} = \{\beta, \mu, K, c, p, \alpha\}$. For the priors $\pi(\{\theta, \omega\})$ the Gamma distribution was used with the mean and variance specified for each parameter.

Prior for	β	μ	K	c	p	α
mean	2.3	0.05	1.3	0.03	1.5	2.1
Var	0.05	1e-4	0.02	1e-4	0.02	0.05