Figures for the electronic edition of *BSSA*

Short-term earthquake forecasting using Early Aftershock STatistics (EAST)

Peter Shebalin[1,2], Clément Narteau[2],
Matthias Holschneider[3], Danijel Schorlemmer[4]

[1] International Institute of Earthquake Prediction Theory and Mathematical Geophysics, 84/32 Profsouznaya, Moscow 117997, Russia.
[2] Institut de Physique du Globe de Paris (IPGP, UMR 7154, CNRS, Univ. P7), 4 Place Jussieu, 75252 Paris Cedex 05, France.
[3] Institutes of Applied and Industrial Mathematics, Universtitat Potsdam, POB 601553, 14115 Potsdam, Germany
[4] Department of Earth Sciences, University of Southern California, 3651 Trousdale Pkwy, Los Angeles, CA 90089, USA.

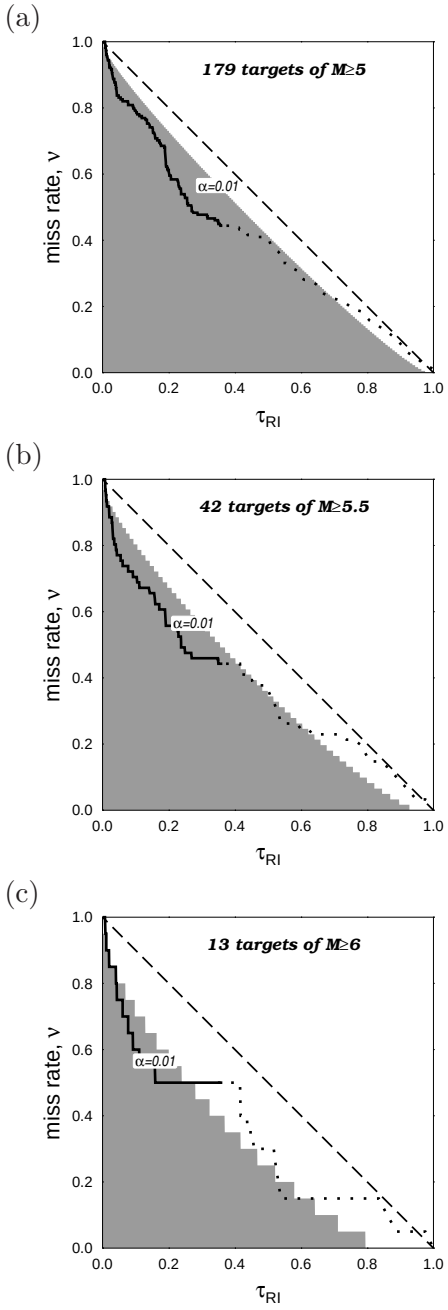

Figure S1: Retrospective evaluation of the EAST model in the California CSEP testing region from 1984 to 2008 for three M_{target} values: (a) $M_{\text{target}} = 5$, (b) $M_{\text{target}} = 5.5$, (c) $M_{\text{target}} = 6$. Using Molchan diagram, we compare the prediction of the EAST model to the prediction of the RI reference model. The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value E_{a}^0 of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the E_{a} value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the reference model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the RI reference model at a level of significance $\alpha = 1\%$.

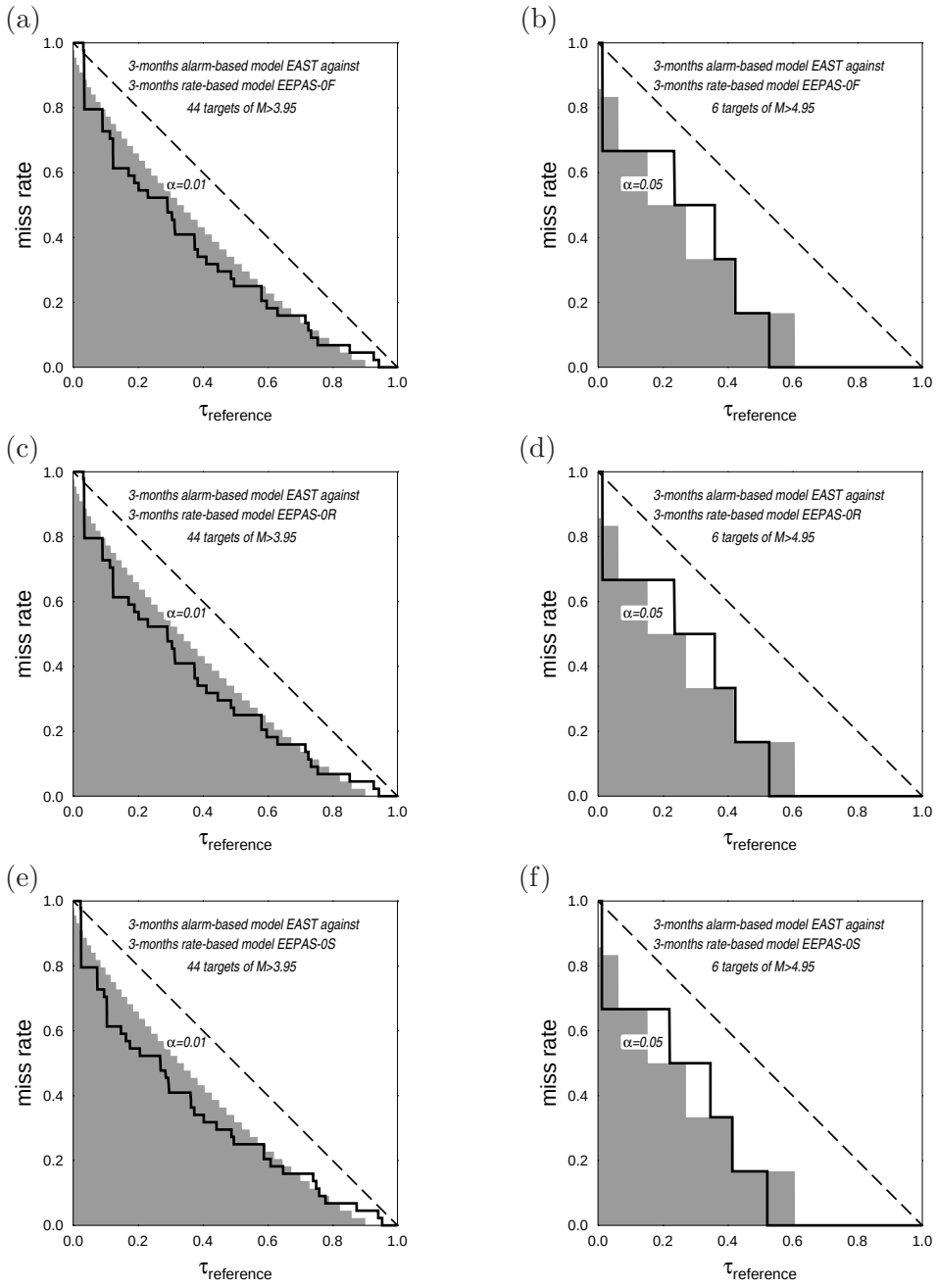

Figure S2: Comparison of the prediction of the EAST model with the prediction of three versions of EEPAS-0, a 3-months rate-based clustering model proposed by *Rhoades (2007)*, for $M_{\text{target}} = 3.95$ (left) and $M_{\text{target}} = 4.95$ (right). Figures (a)-(b), (c)-(d) and (e)-(f) correspond to models EEPAS-0F, EEPAS-0R and EEPAS-0S respectively. The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value E_{a}^0 of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the E_{a} value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the chosen EEPAS-0 model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the chosen EEPAS-0 model at a level of significance $\alpha = 1\%$.

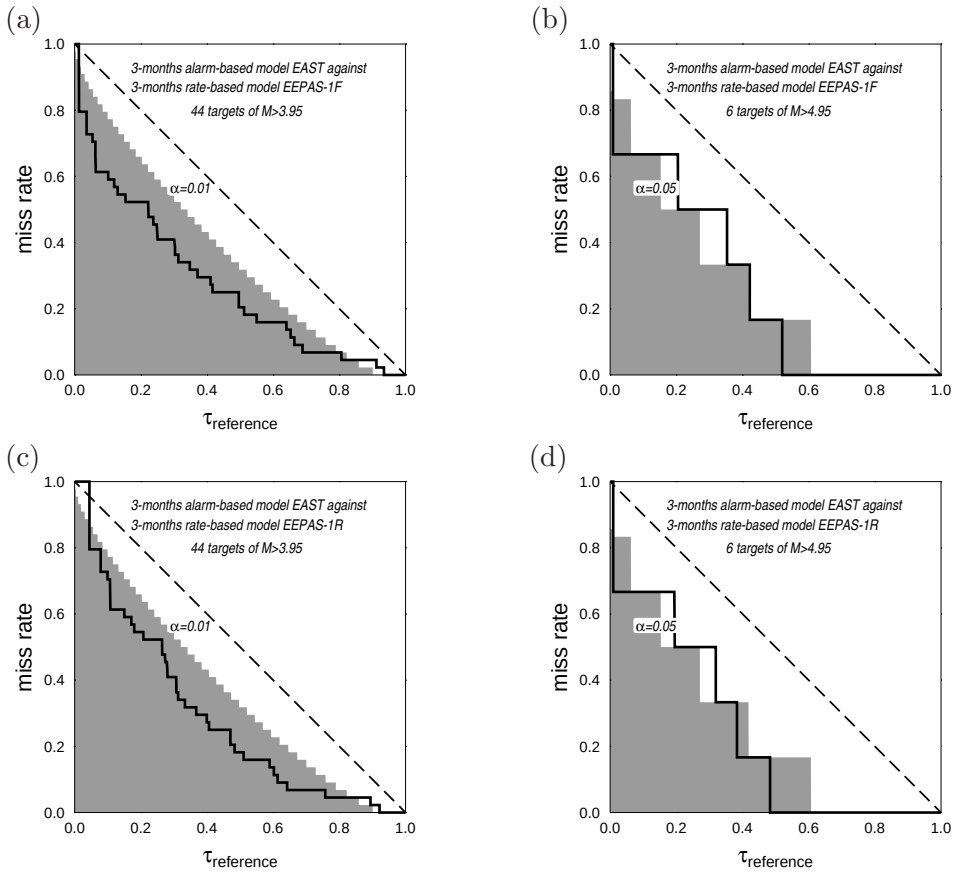

Figure S3: Comparison of the prediction of the EAST model with the prediction of two versions of EEPAS-1, a three-months rate-based clustering model proposed by *Rhoades (2007)*, for $M_{\rm target} = 3.95$ (left) and $M_{\rm target} = 4.95$ (right). Figures (a)-(b) and (c)-(d) correspond to models EEPAS-1F and EEPAS-1R respectively. The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value $E_{\rm a}^0$ of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the $E_{\rm a}$ value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the chosen EEPAS-1 model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the chosen EEPAS-1 model at a level of significance $\alpha = 1\%$.

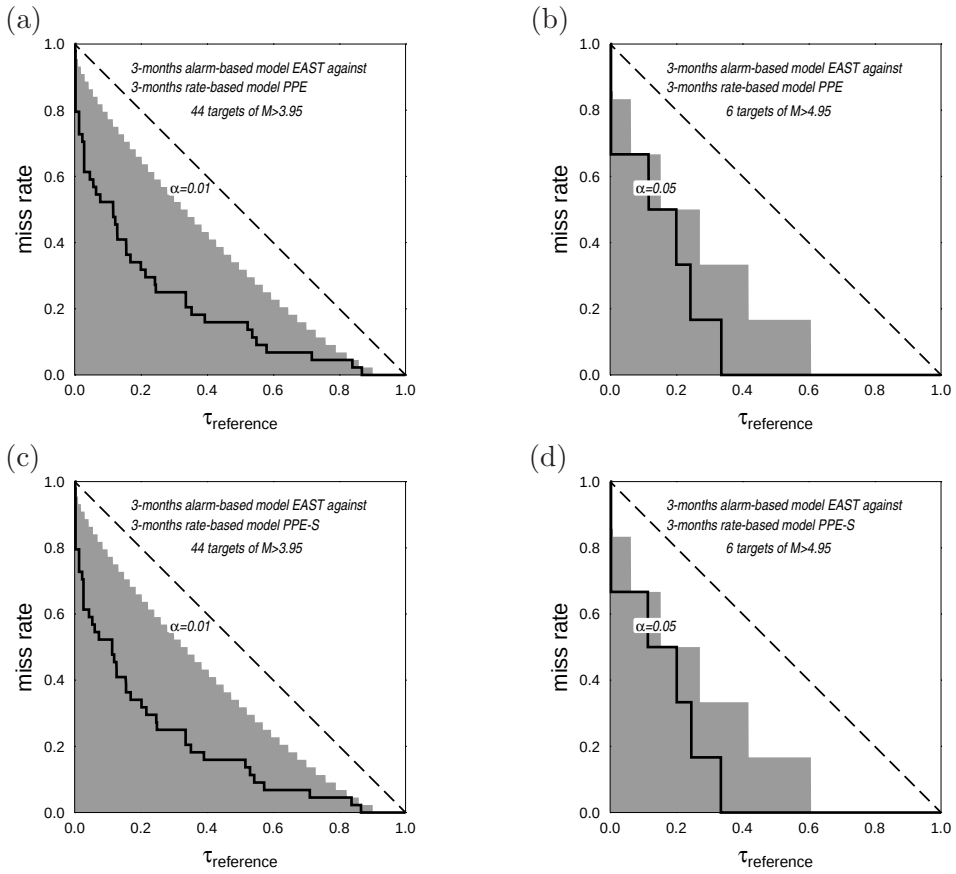

Figure S4: Comparison of the prediction of the EAST model with the prediction of two versions of PPE, a three months rate-based clustering model proposed by *Rhoades (2007)*, for $M_{\text{target}} = 3.95$ (left) and $M_{\text{target}} = 4.95$ (right). Figures (a)-(b) and (c)-(d) correspond to models PPE and PEE-S respectively. The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value E_{a}^0 of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the E_{a} value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the chosen PEE model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the chosen PEE model at a level of significance $\alpha = 1\%$.

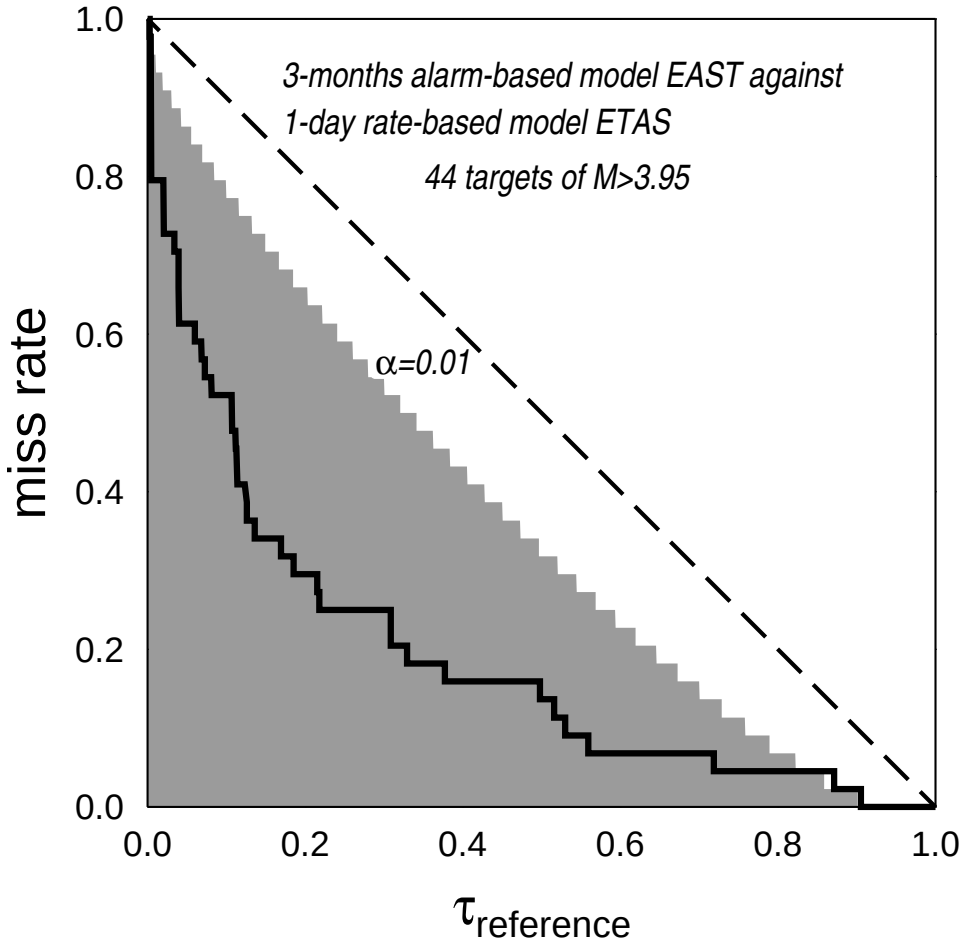

Figure S5: Comparison of the prediction of the EAST model with the prediction of a one-day ETAS model for $M_{\text{target}} = 3.95$ (this model prepared for the test in California by Zhuang and Liukis following *Ogata, 1998*). The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value E_{a}^0 of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the E_{a} value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the EAST model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the chosen ETAS model at a level of significance $\alpha = 1\%$.

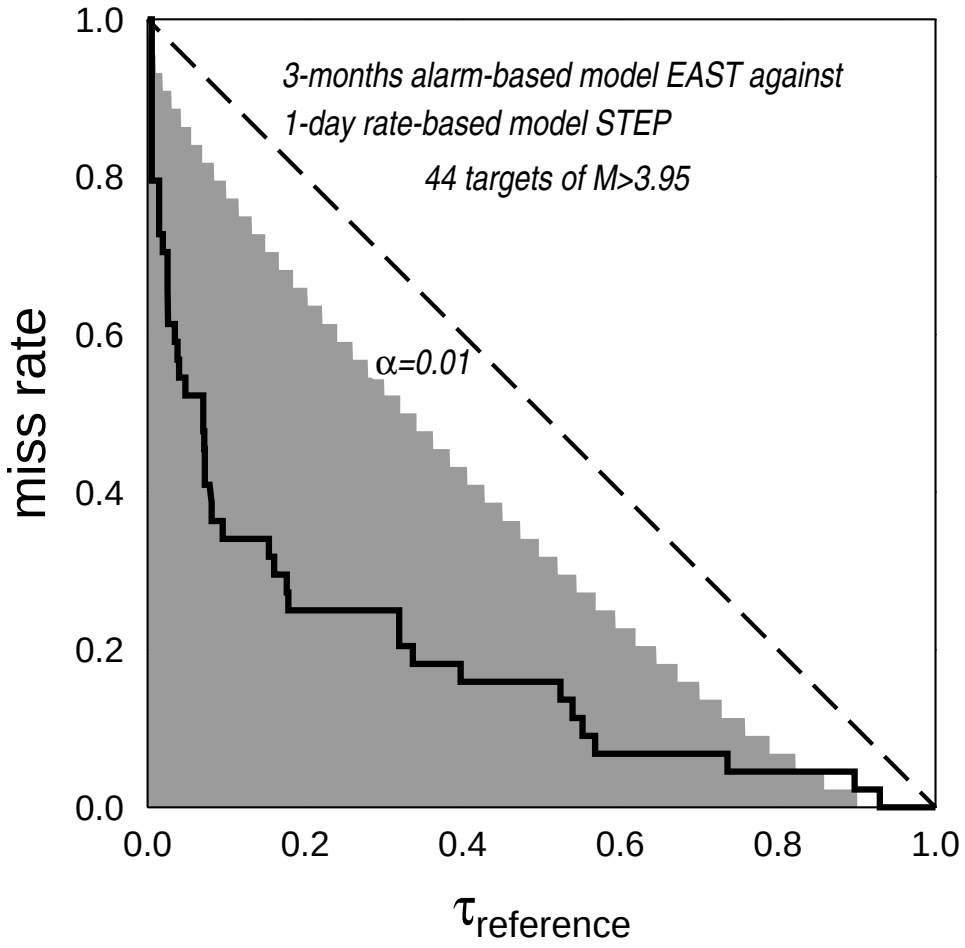

Figure S6: Comparison of the prediction of the EAST model with the prediction of a one-day STEP model for $M_{\text{target}} = 3.95$ *(Gerstenberger et al. 2005)*. The solid line is the Molchan trajectory calculated from the highest to the smallest threshold value E_{a}^0 of the alarm function. The dotted line is the Molchan trajectory that incorporate zones where the E_{a} value cannot be defined (see text). The dashed diagonal line corresponds to an unskilled forecast model with respect to the STEP model. The shaded area indicates the zone of the Molchan diagram in which the prediction of the EAST model is better than the prediction of the chosen STEP model at a level of significance $\alpha = 1\%$.