

Electronic supplement of:

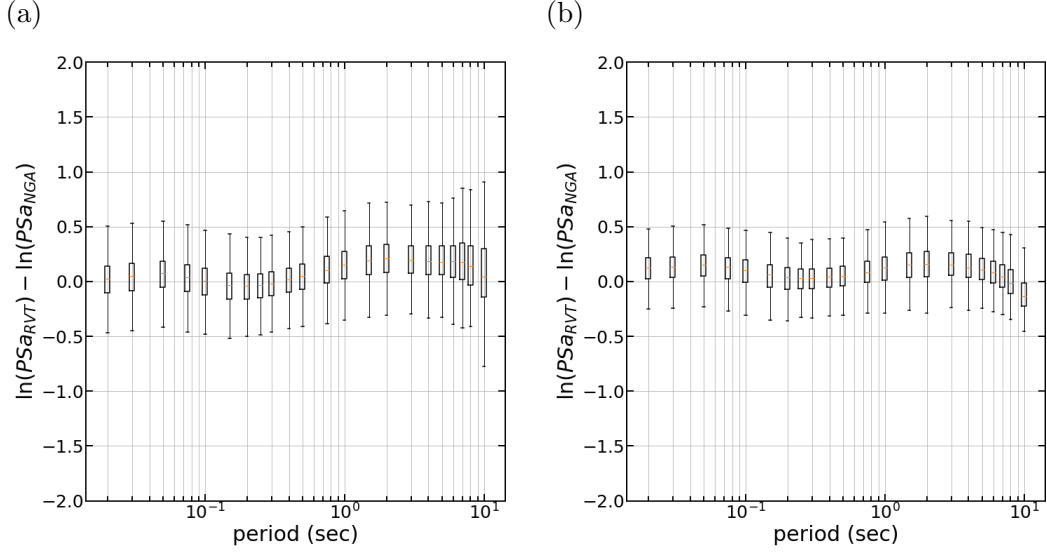
A Non-ergodic Spectral Acceleration Ground Motion Model for
California Developed with Random Vibration Theory

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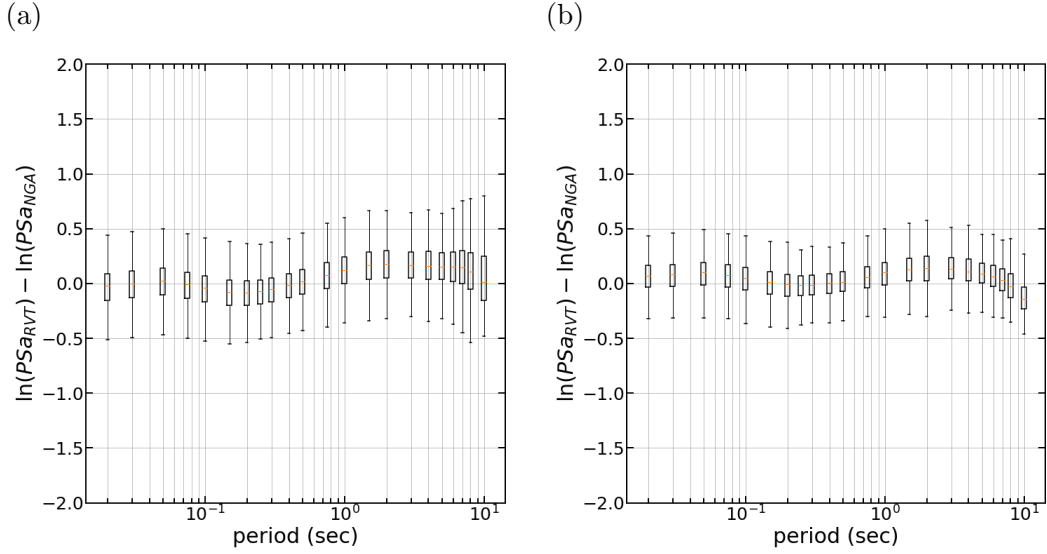
S1 Comparison of different duration intervals for D_{gm}

Figures S1 to S5 show the residuals between the records' PSa and the PSa estimated with RVT. The RVT PSa were estimated with $V75$ peak factors, records' actual duration for D_{gm} , and $BT15$ for D_{rms} . D_{gm} is equal to: D_{a5-75} in Figure S1, D_{a5-80} in Figure S2, D_{a5-85} in Figure S3, D_{a5-90} in Figure S4, and D_{a5-95} in Figure S5.

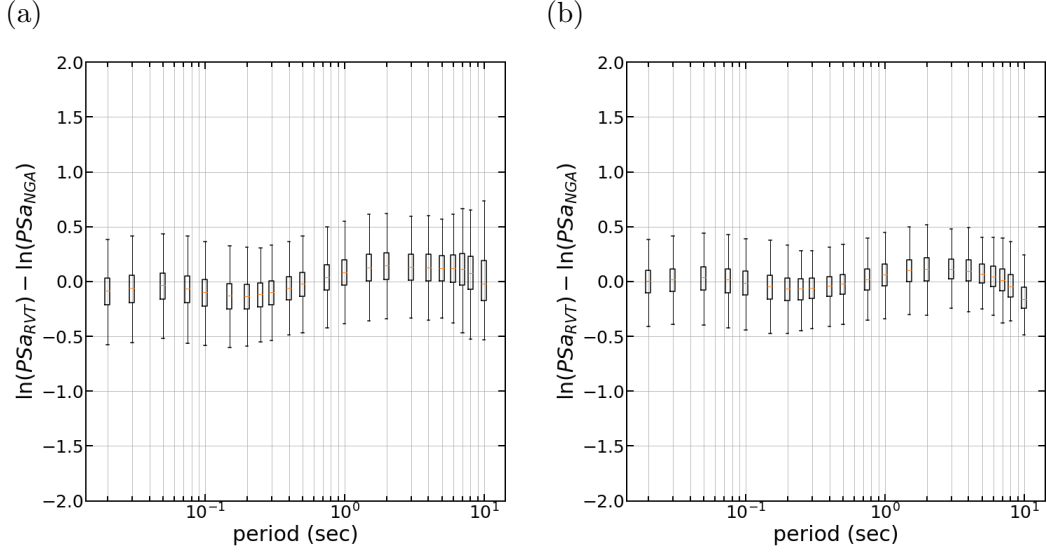
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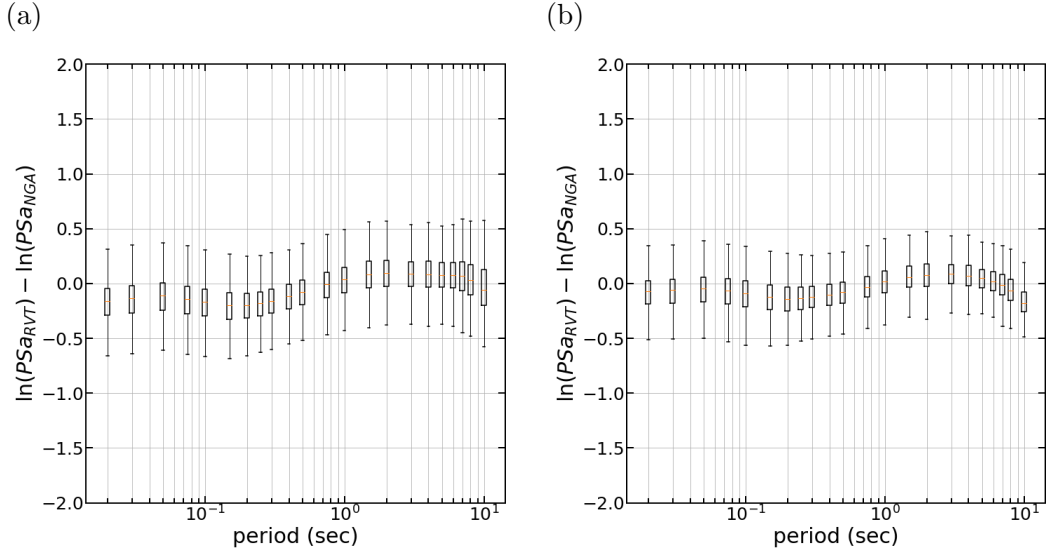
E. Supplement, Fig. S1: Residuals between the records' PSa and the RVT PSa . V75 PF , records' $D_{a0.05-0.75}$ as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



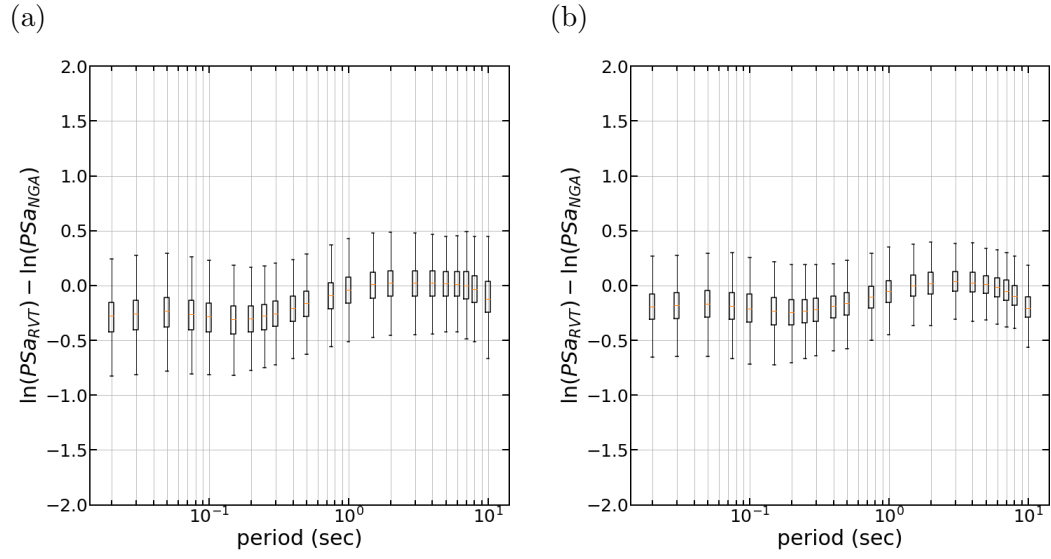
E. Supplement, Fig. S2: Residuals between the records' PSa and the RVT PSa . V75 PF , records' $D_{a0.05-0.80}$ as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



E. Supplement, Fig. S3: Residuals between the records' PSa and the RVT PSa . V75 PF , records' $D_{a0.05-0.85}$ as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



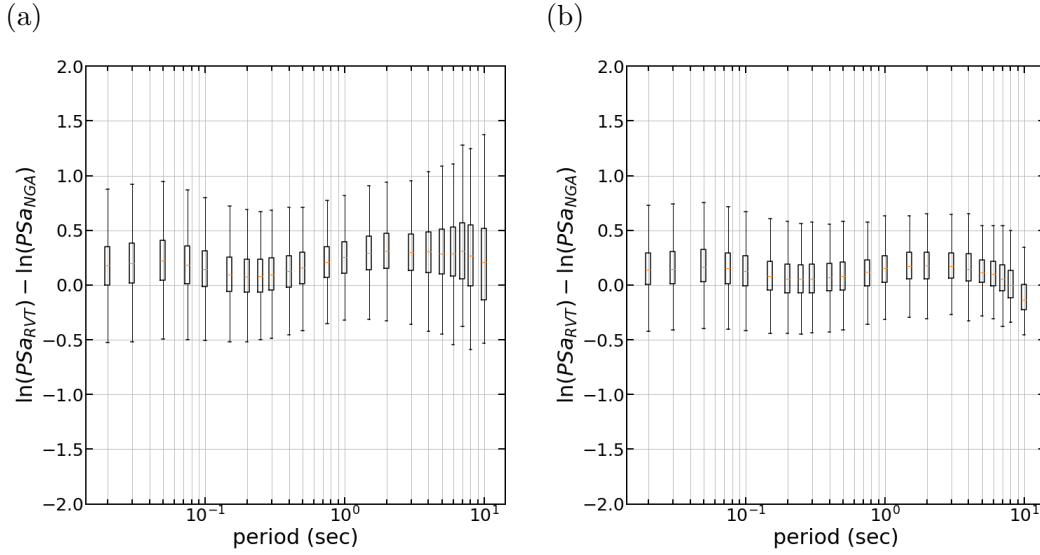
E. Supplement, Fig. S4: Residuals between the records' PSa and the RVT PSa . V75 PF , records' $D_{a0.05-0.90}$ as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



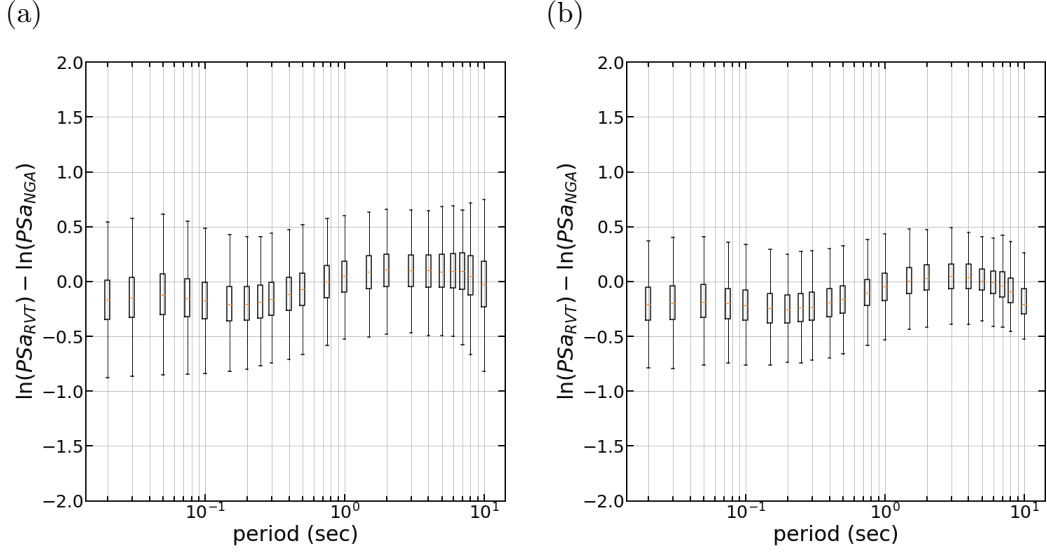
E. Supplement, Fig. S5: Residuals between the records' PSa and the RVT PSa . V75 PF , records' $D_{a0.05-0.95}$ as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$

S2 Comparison of different duration models for D_{gm}

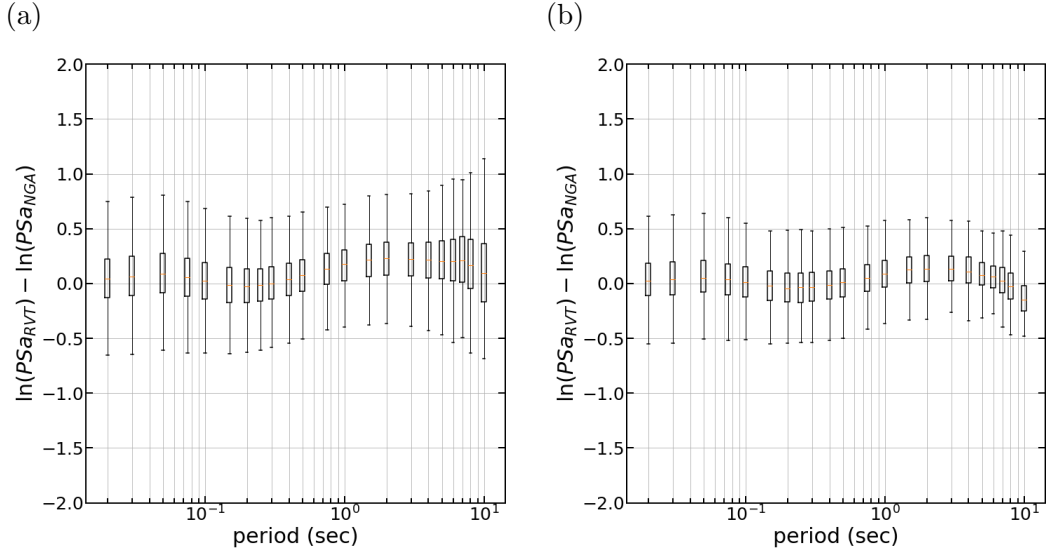
Figures S6 to S12 show the residuals between the records' PSa and the PSa estimated with RVT. The RVT PSa were estimated with $V75$ peak factors, the D_{gm} estimated with a duration GMM, and $BT15$ for D_{rms} . D_{gm} is based on: KS06 D_{a5-75} in Figure S6, KS06 D_{a5-95} in Figure S7, KS06 D_{v5-75} in Figure S8, the KS06 D_{v5-95} in Figure S9, AS16 D_{a5-75} in Figure S10, AS16 D_{a5-95} in Figure S11, and AS16 2 D_{a20-80} in Figure S12.



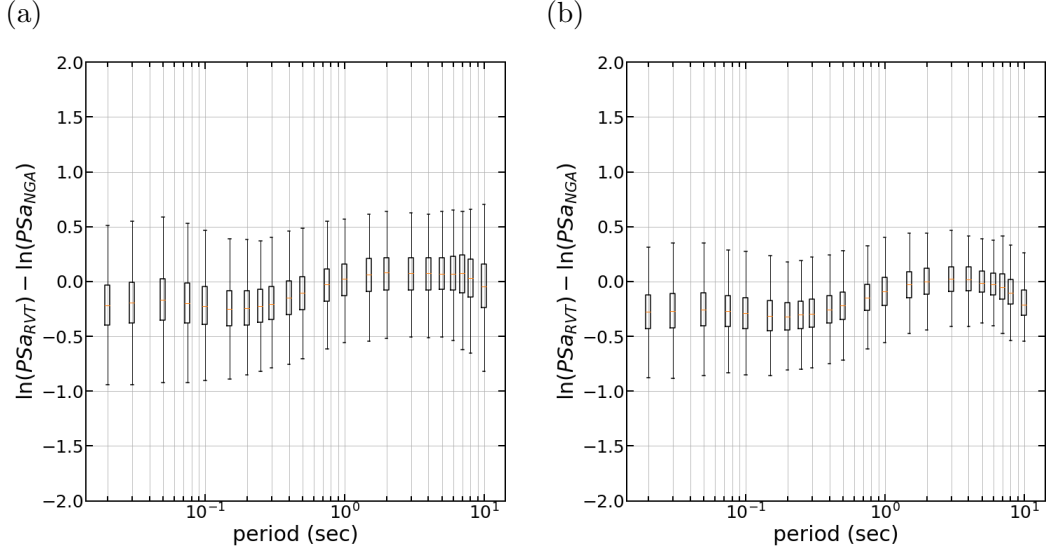
E. Supplement, Fig. S6: Residuals between the records' PSa and the RVT PSa . $V75$ PF , $D_{a0.05-0.75}$ from KS06 as D_{gm} , and $BT15$ D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



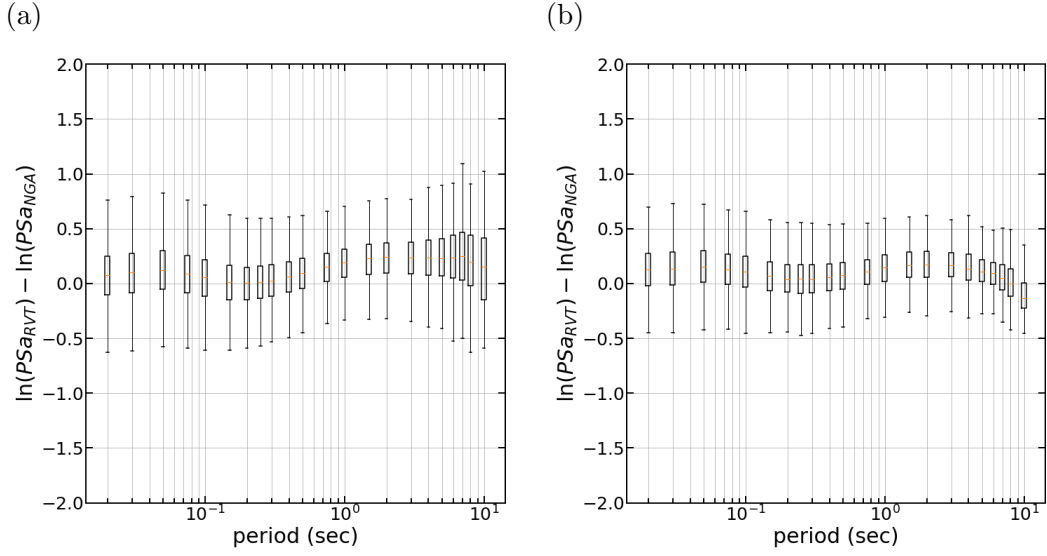
E. Supplement, Fig. S7: Residuals between the records' PSa and the RVT PSa . V75 PF , $D_{a0.05-0.95}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



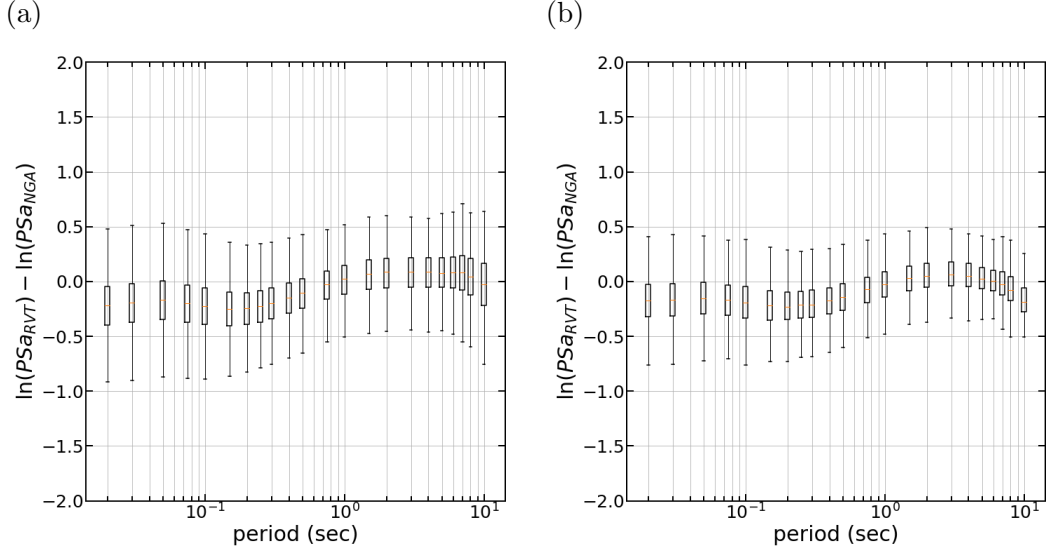
E. Supplement, Fig. S8: Residuals between the records' PSa and the RVT PSa . V75 PF , $D_{v0.05-0.75}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



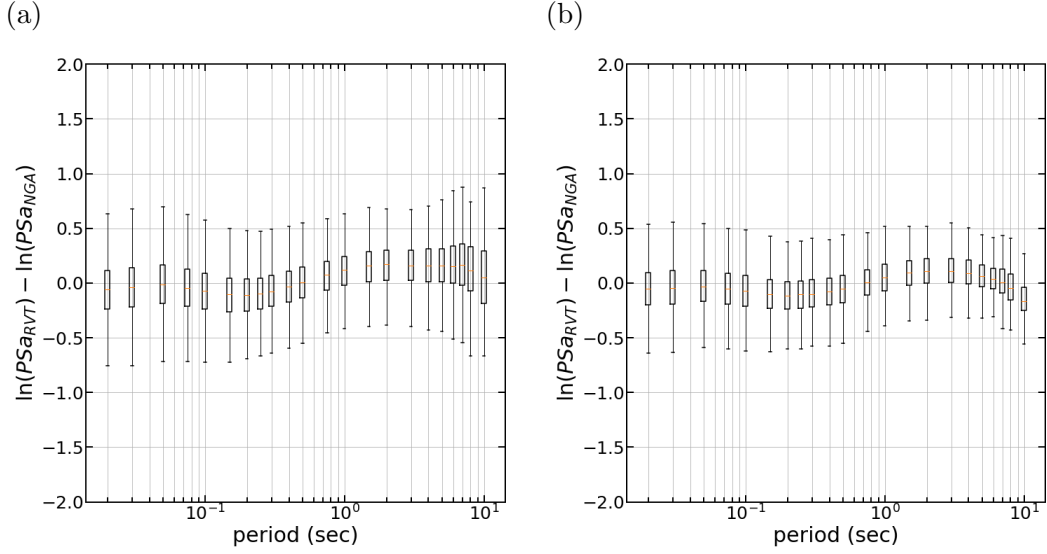
E. Supplement, Fig. S9: Residuals between the records' PSa and the RVT PSa . V75 PF , $D_{v0.05-0.95}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



E. Supplement, Fig. S10: Residuals between the records' PSa and the RVT PSa . V75 PF , $D_{a0.05-0.75}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



E. Supplement, Fig. S11: Residuals between the records' PSa and the RVT PSa . V75 PF , $D_{a0.05-0.95}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$



E. Supplement, Fig. S12: Residuals between the records' PSa and the RVT PSa . V75 PF , 2 $D_{a0.20-0.95}$ from KS06 as D_{gm} , and BT15 D_{rms} . (a) residuals for all M , (b) residuals for $M > 5$