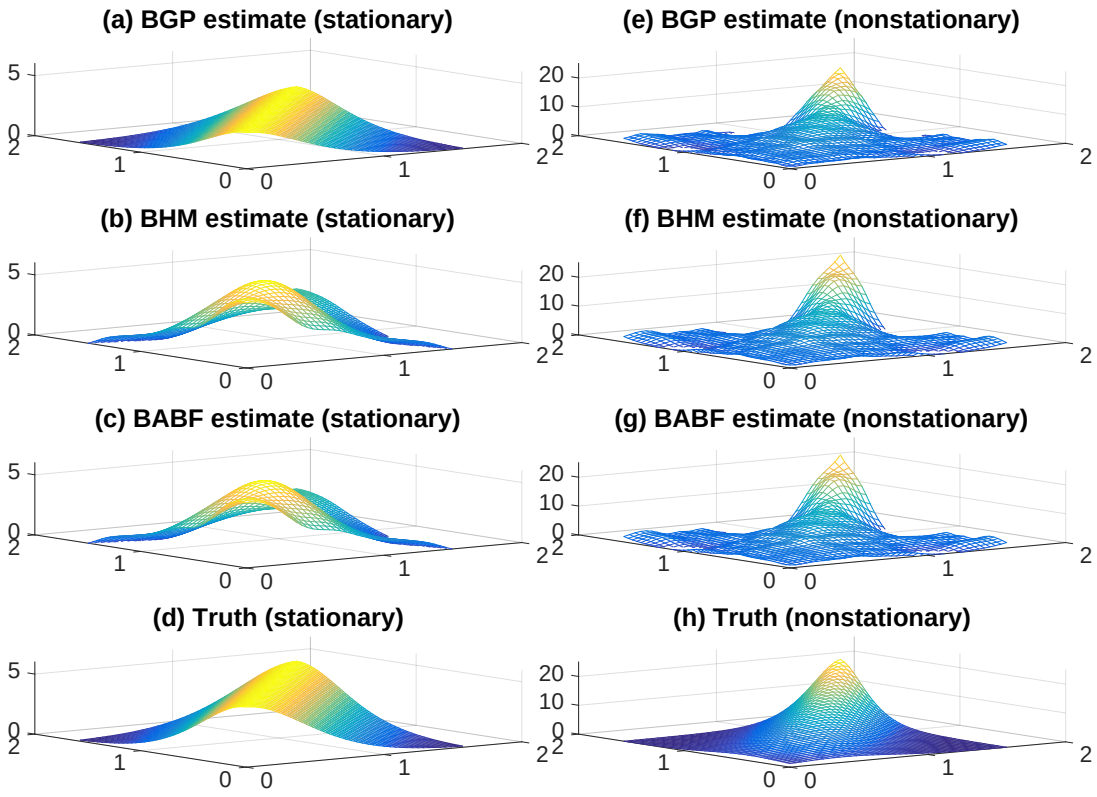
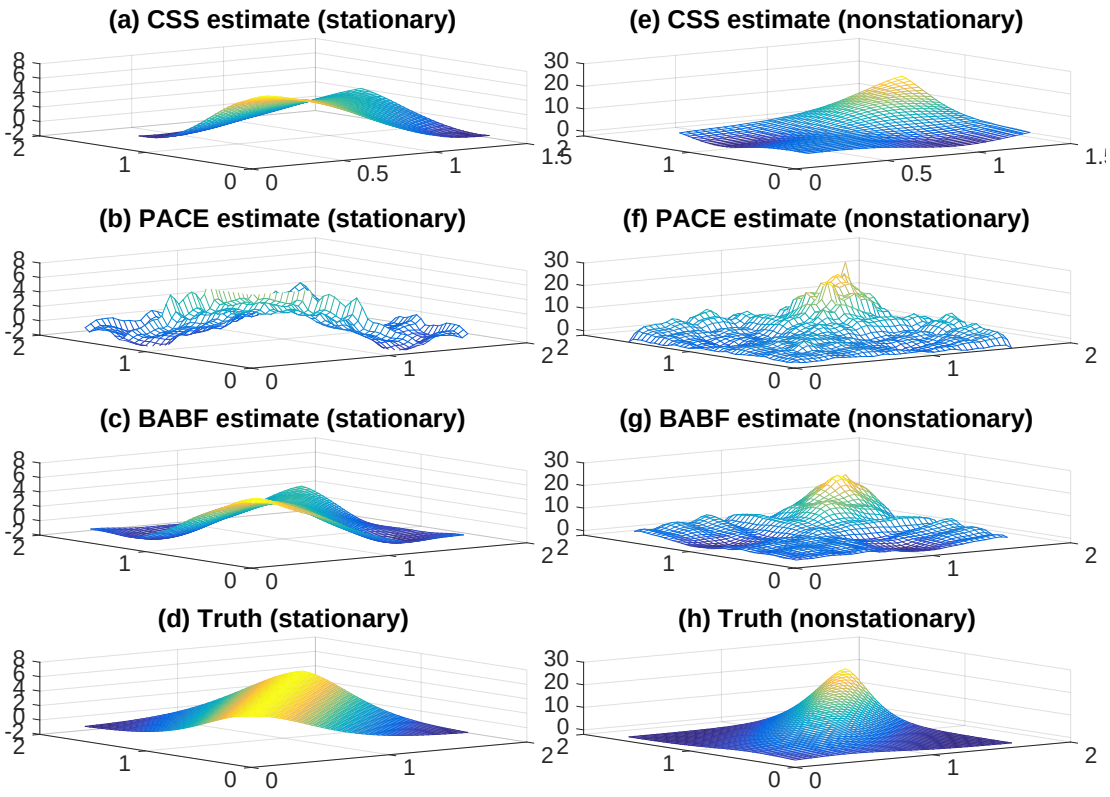
Web-based Supplementary Materials

for *Efficient Bayesian hierarchical functional data analysis with basis function approximations using Gaussian-Wishart processes*

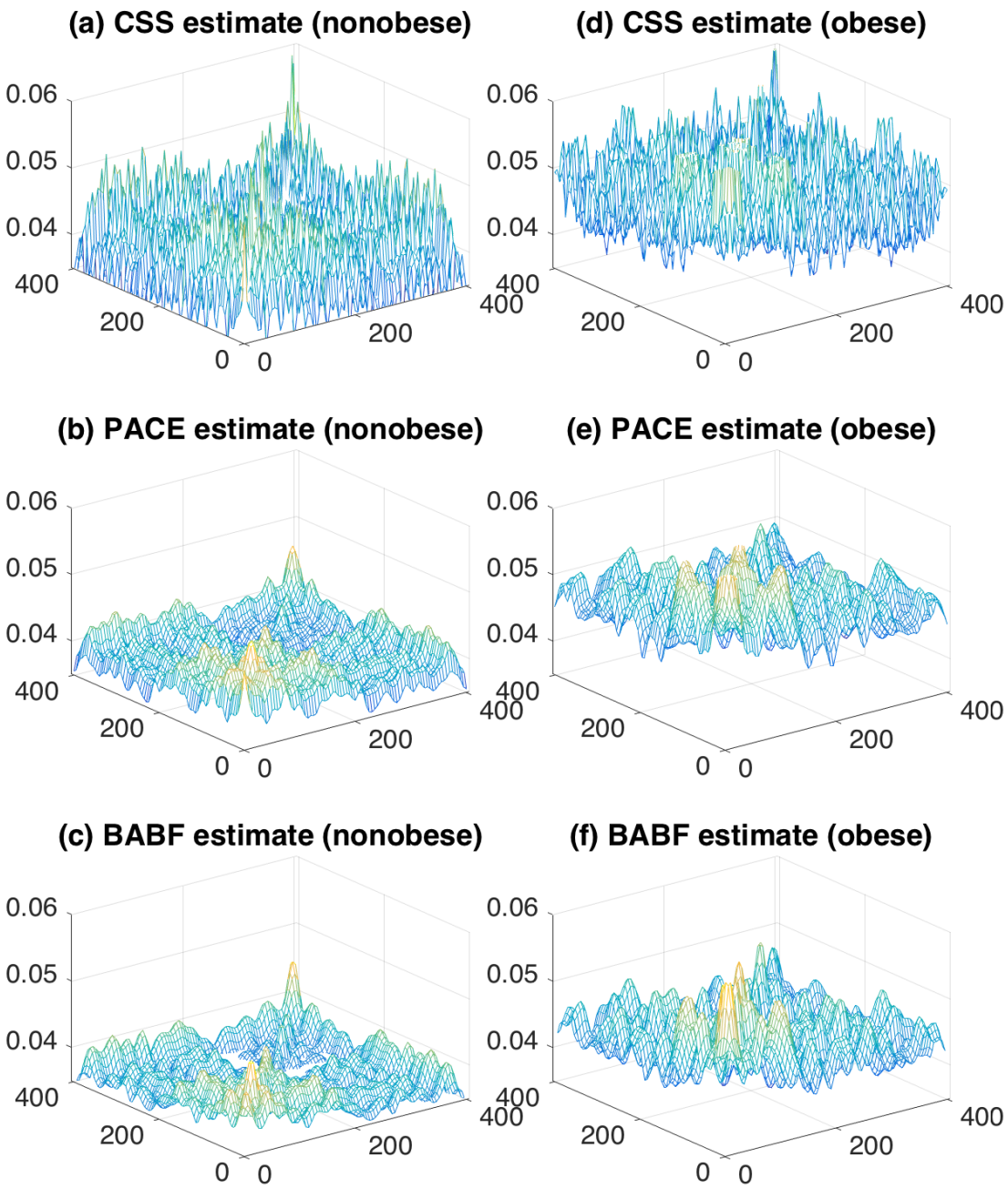
by Jingjing Yang, Dennis D. Cox, Jong Soo Lee, Peng Ren, Taeryon Choi



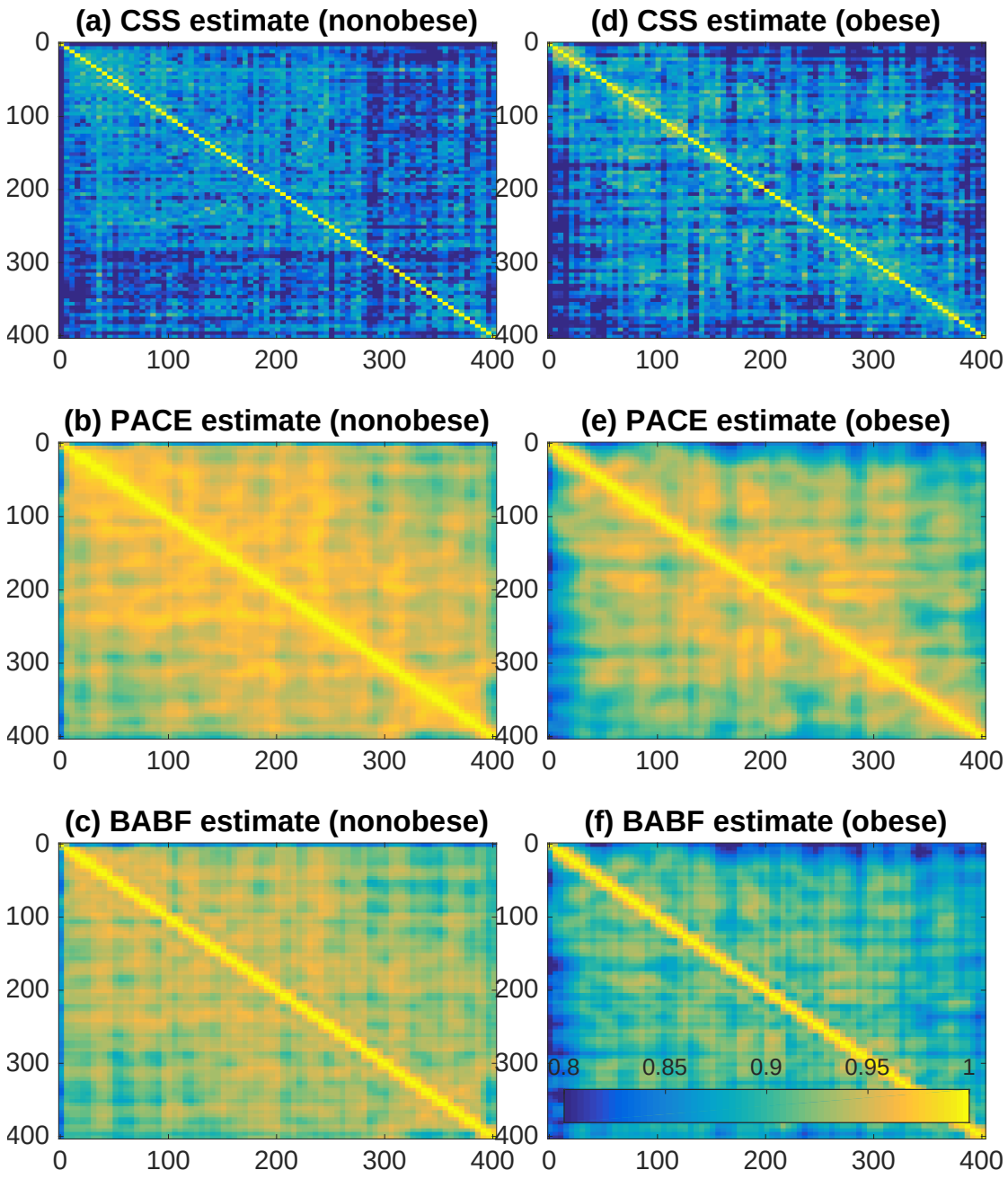
Web Figure 1: Covariance estimates and the true covariances of common grids.



Web Figure 2: Covariance estimates and the true covariances of random grids.



Web Figure 3: Covariance estimates by CSS, PACE, and BABF with the real SEE data.



Web Figure 4: Heatmaps of the correlation estimates by CSS, PACE, and BABF with the real SEE data.

Web Table 1: Example coverage probabilities for the 95% pointwise credible intervals of $\{Z_i(\boldsymbol{t})\}$, $\mu(\boldsymbol{t})$, and $\Sigma(\boldsymbol{t},\boldsymbol{t})$ by BGP, BHM and BABF with common observation grids. The highest probability is bold for each parameter.

		BGP	BHM	BABF
$\{Z_i(\boldsymbol{t})\}$	Stationary	**0.9483**	0.9217	0.9208
	Nonstationary	0.8350	**0.9450**	0.8742
$\mu(\boldsymbol{t})$	Stationary	**0.7500**	0.7250	0.7250
	Nonstationary	0.6750	0.6750	0.6750
$\Sigma(\boldsymbol{t},\boldsymbol{t})$	Stationary	0.0000	**0.7869**	**0.7869**
	Nonstationary	0.3819	0.9913	**0.9938**

Web Table 2: Example coverage probabilities for the 95% pointwise credible intervals of $\{Z_i(\boldsymbol{t})\}$, $\mu(\boldsymbol{t})$, and $\Sigma(\boldsymbol{t},\boldsymbol{t})$ by BABF with random observation grids. The relatively low coverage probabilities for nonstationary signals are due to narrow 95% confidence intervals.

		BABF
$\{Z_i(\boldsymbol{t})\}$	Stationary	0.8650
	Nonstationary	0.5625
$\mu(\boldsymbol{t})$	Stationary	1.0000
	Nonstationary	0.9000
$\Sigma(\boldsymbol{t},\boldsymbol{t})$	Stationary	0.9506
	Nonstationary	0.8550