Supplementary Material for "Small sample evaluation of resampling-based inference for topological features of neuroimages"

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[1] 51925

	Overall
	(N=682)
sex	
Female	422 (61.9%)
Male	260 (38.1%)
age	
Mean (SD)	42.9 (21.6)
Median [Min, Max]	45.1 [6.18, 85.6]
race	
Other	200 (29.3%)
White	482 (70.7%)
GMvol	
Mean (SD)	77000 (11000)
Median [Min, Max]	75100 [52600, 116000]

Simulation functions

Simulation results

Details of the simulation analyses and evaluation metrics are given in Section 4 of the paper. This section presents results for all simulations for parametric and robust test statistics evaluating the marginal and global CDFs.

Sex covariate

The effect of sex was removed from the imaging data using equation (13), and then bootstrap samples of the residuals were modeled as a function of sex and tested on one degree of freedom. Type 1 error rates and QQ-plot are given below.

Global distributions

Fake group variable

Group was simulated independently of the imaging data and the bootstrap samples of the imaging data were modeled and tested on 3 degrees of freedom. Type 1 error rates and QQ-plot are given below.

Marginal distribution

```
## MaximaMass; cft = 0.01Mass; cft = 0.001Extent; cft = 0.01Extent; cft = 0.001pTFCEGlobal MaximaGlobal
```

Global distributions

Age continuous covariate fit with splines

The imaging data were residualized to age and other covariates using equation (13) in the main paper, then bootstrap samples of the residuals were modeled with age using splines on 4 degrees of freedom. the test was for the nonlinear effect of age over the linear age effect on 3 degrees of freedom.

Marginal distribution

```
## MaximaMass; cft = 0.01Mass; cft = 0.001Extent; cft = 0.01Extent; cft = 0.001pTFCEGlobal MaximaGlobal
```

Global distributions

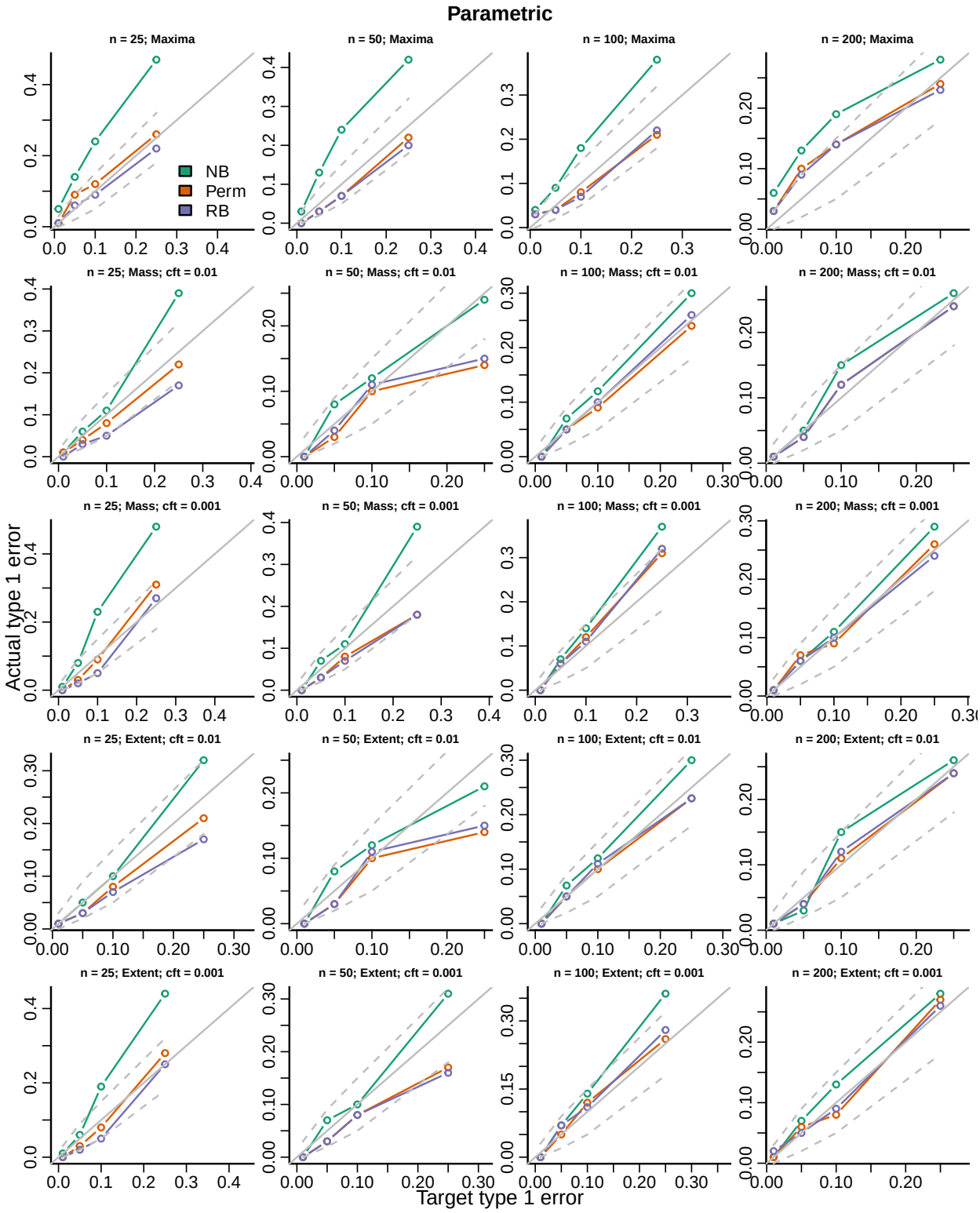

Figure 1: Actual versus target type 1 error rates for the inference procedures considered for testing the marginal distribution of each topological feature (TF) of the parametric test statistics image.

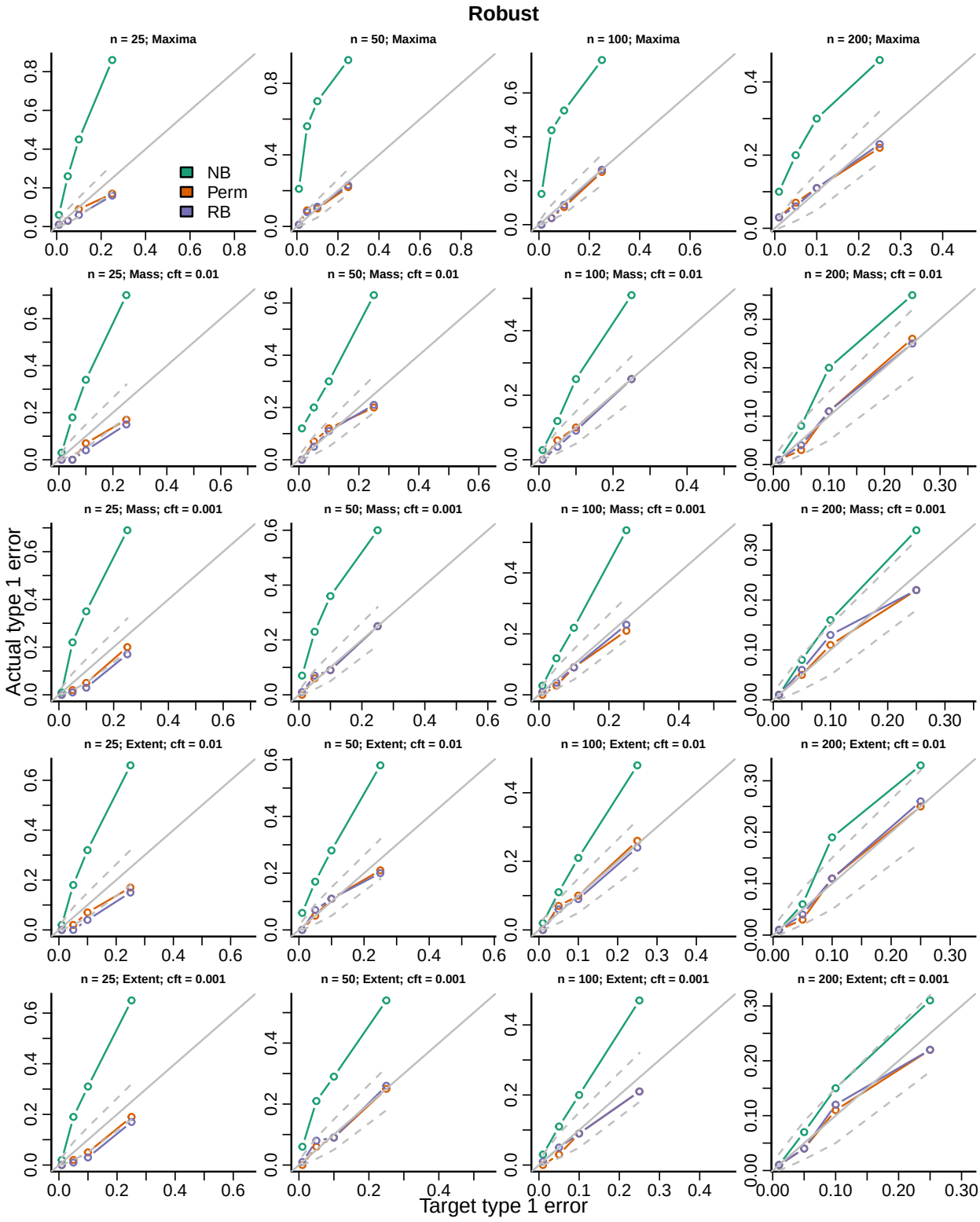

Figure 2: Actual versus target type 1 error rates for the inference procedures considered for testing the marginal distribution of each topological feature (TF) of the robust test statistics image.

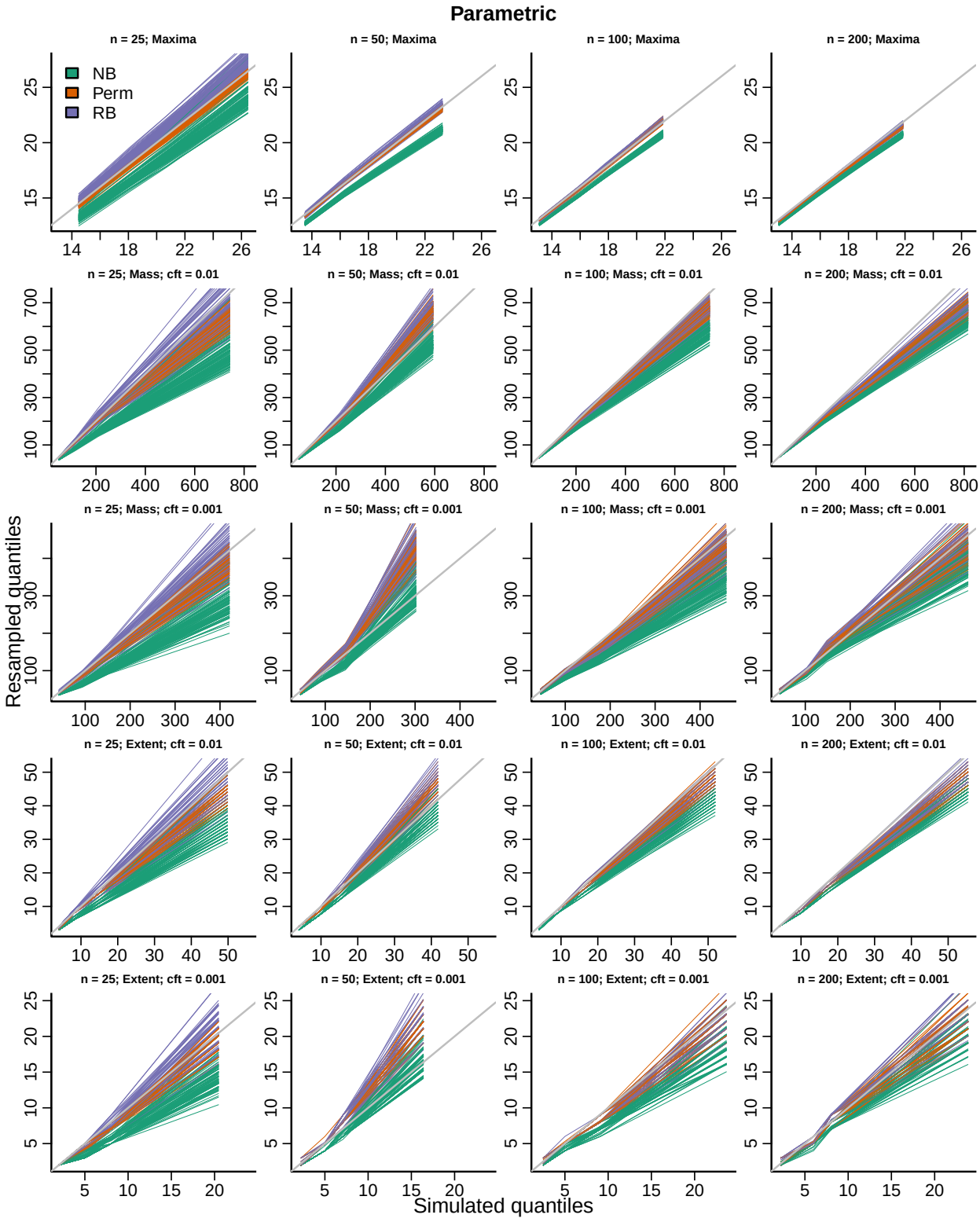

Figure 3: QQ-plot for the inference procedures considered for the marginal distribution of each topological feature (TF) of the parametric test statistics image.

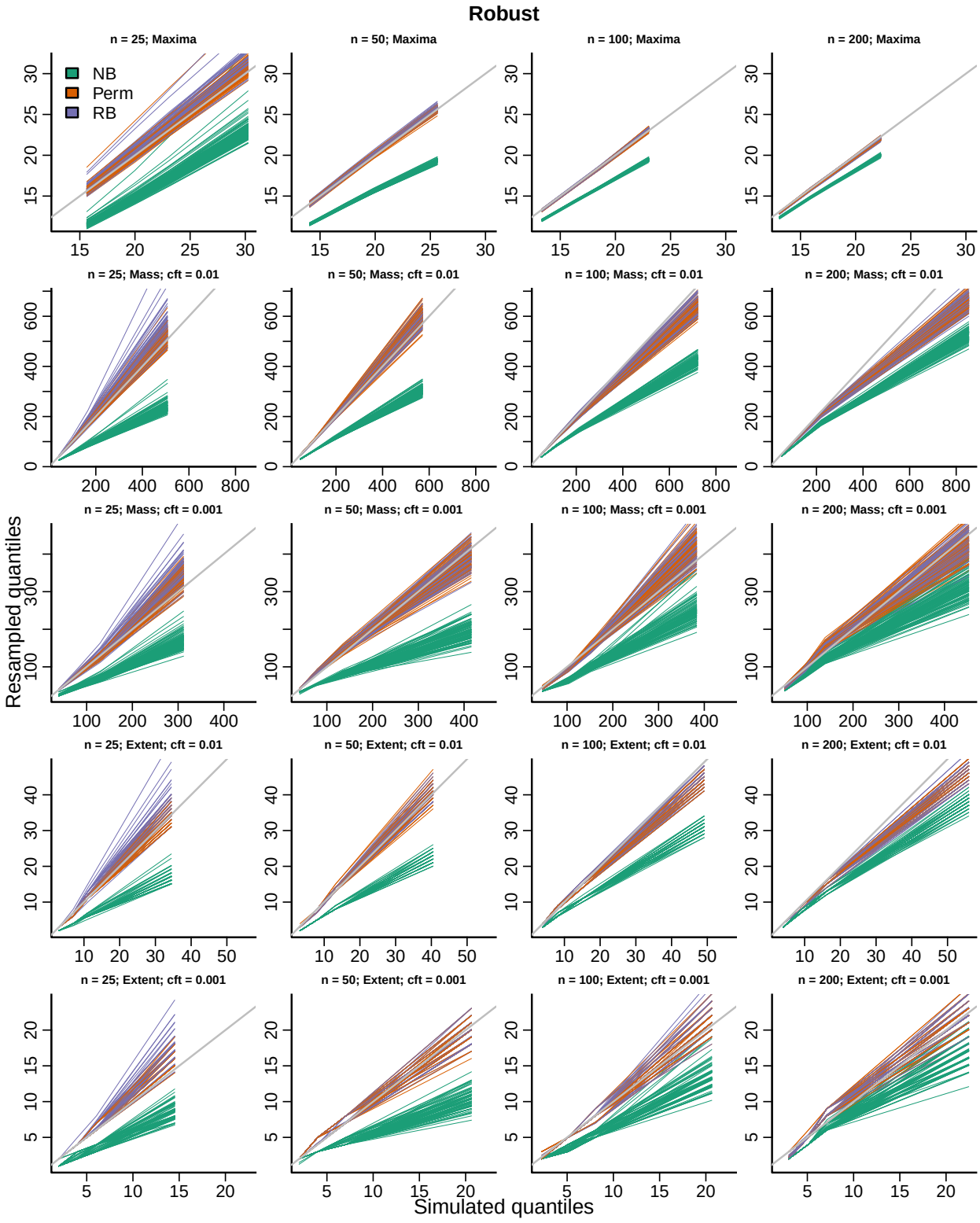

Figure 4: QQ-plot for the inference procedures considered for the marginal distribution of each topological feature (TF) of the robust test statistics image.

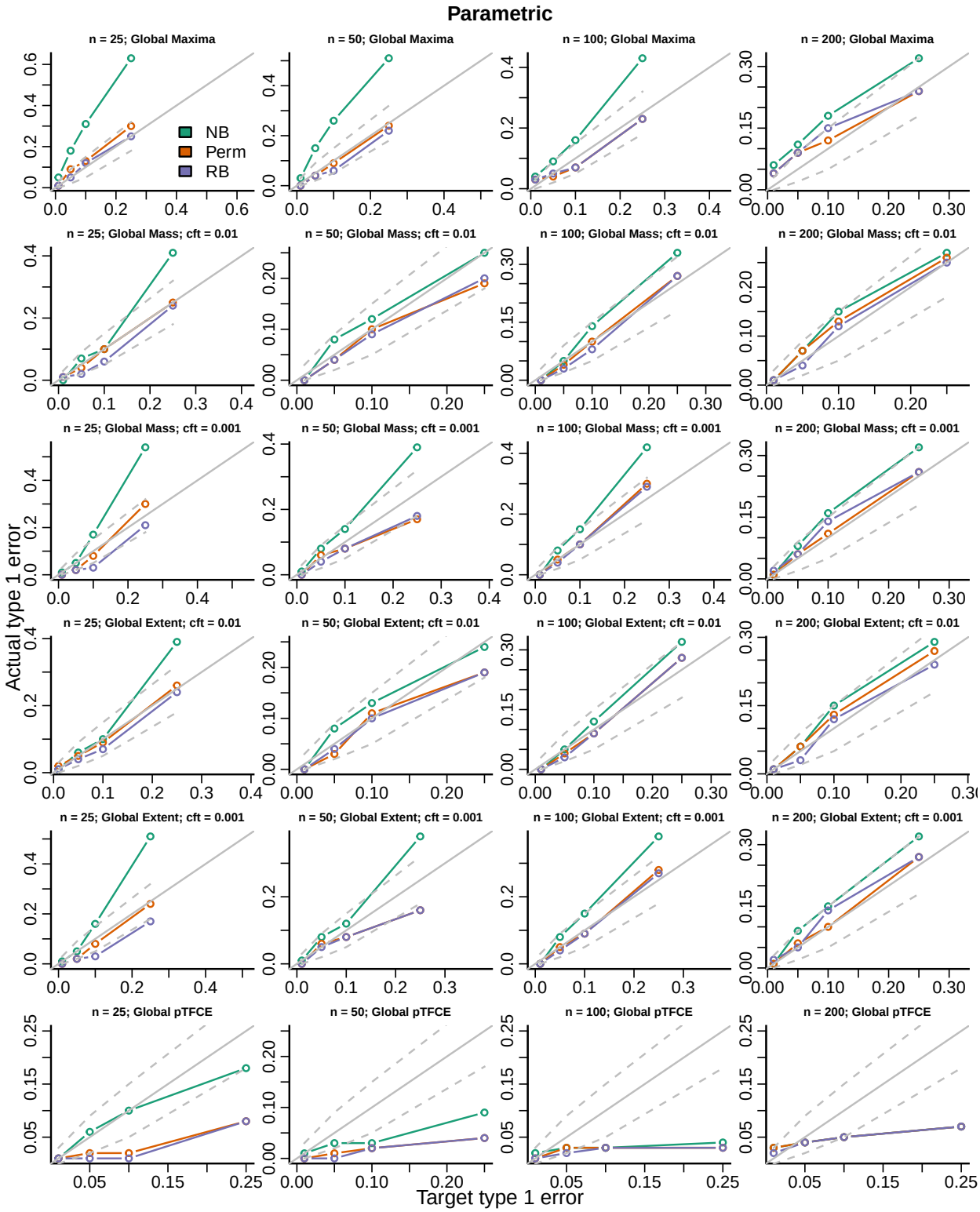

Figure 5: Actual versus target type 1 error rates for the inference procedures considered for testing the distribution of the global maximum of each topological feature (TF) of the parametric test statistics image.

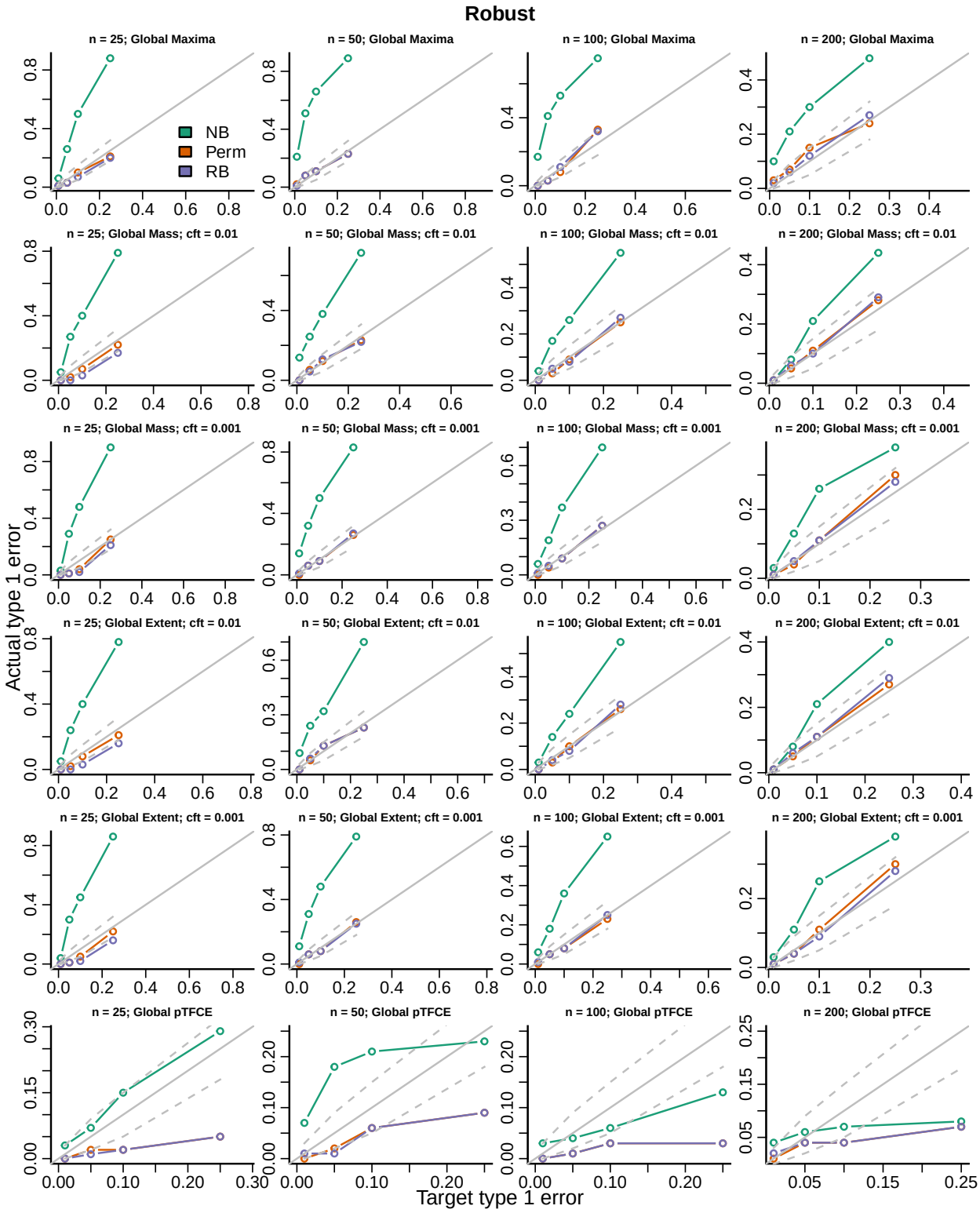

Figure 6: Actual versus target type 1 error rates for the inference procedures considered for testing the distribution of the global maximum of each topological feature (TF) of the robust test statistics image.

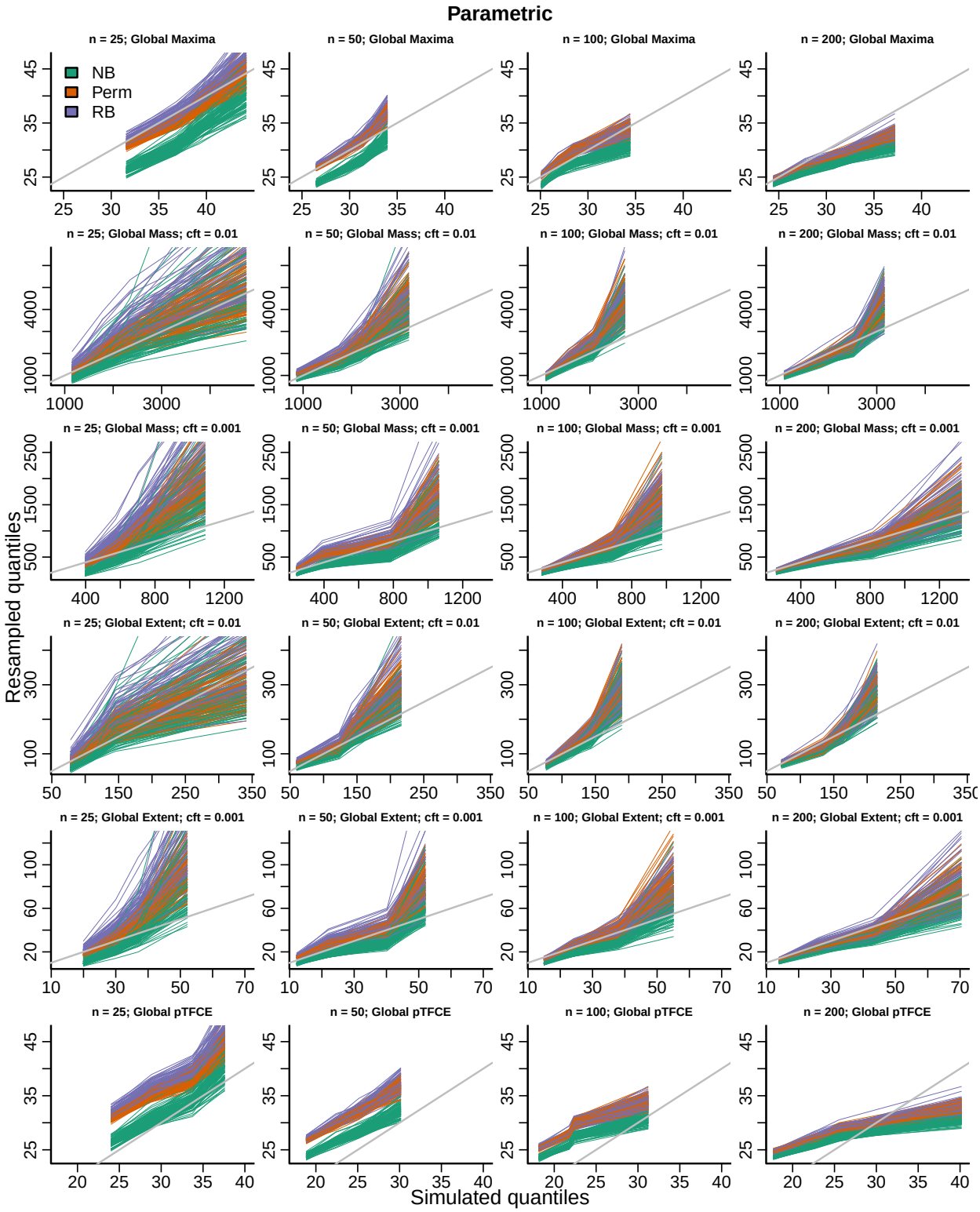

Figure 7: QQ-plot for the inference procedures considered for the distribution of the global maximum of each topological feature (TF) of the parametric test statistics image.

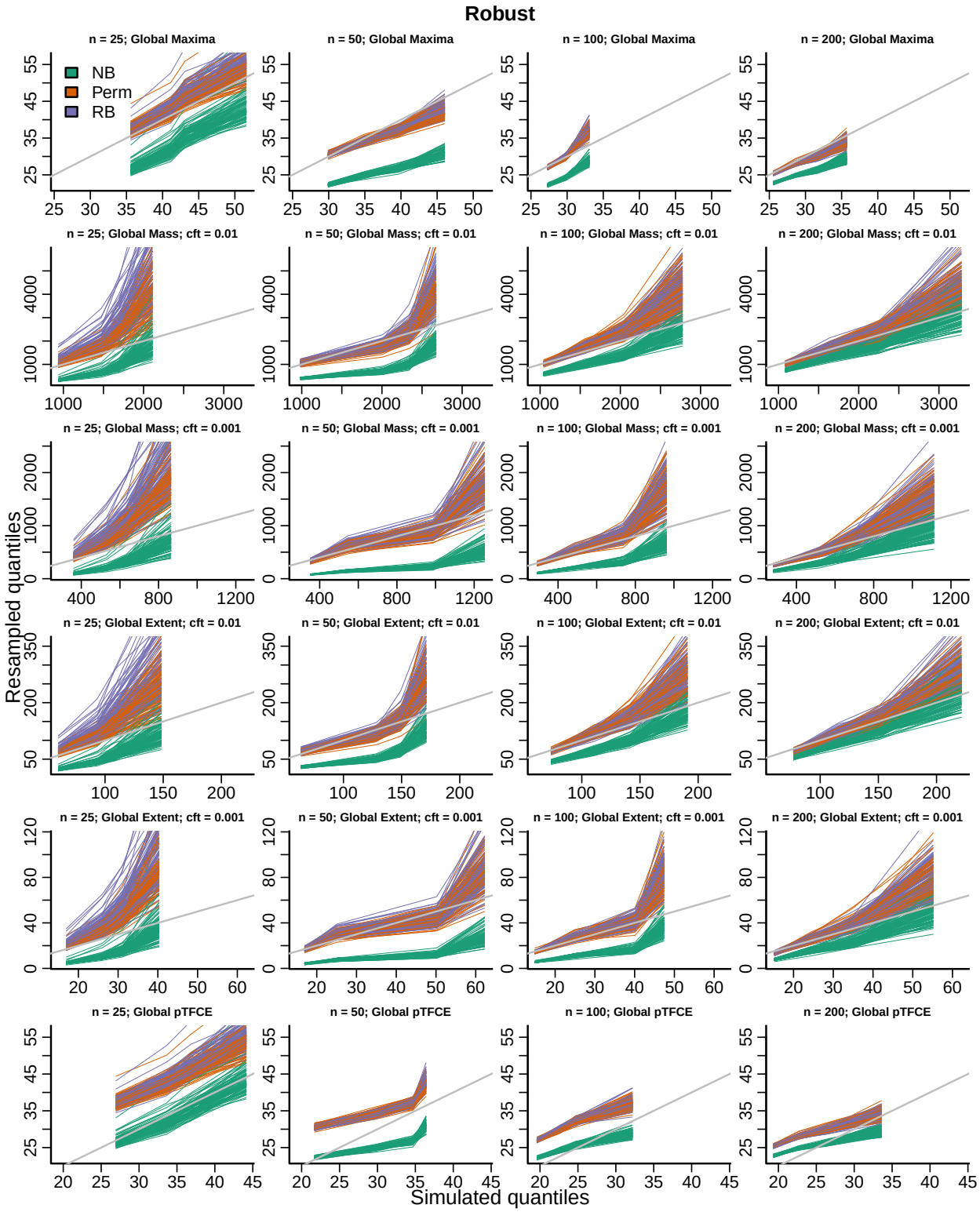

Figure 8: QQ-plot for the inference procedures considered for the distribution of the global maximum of each topological feature (TF) of the robust test statistics image.

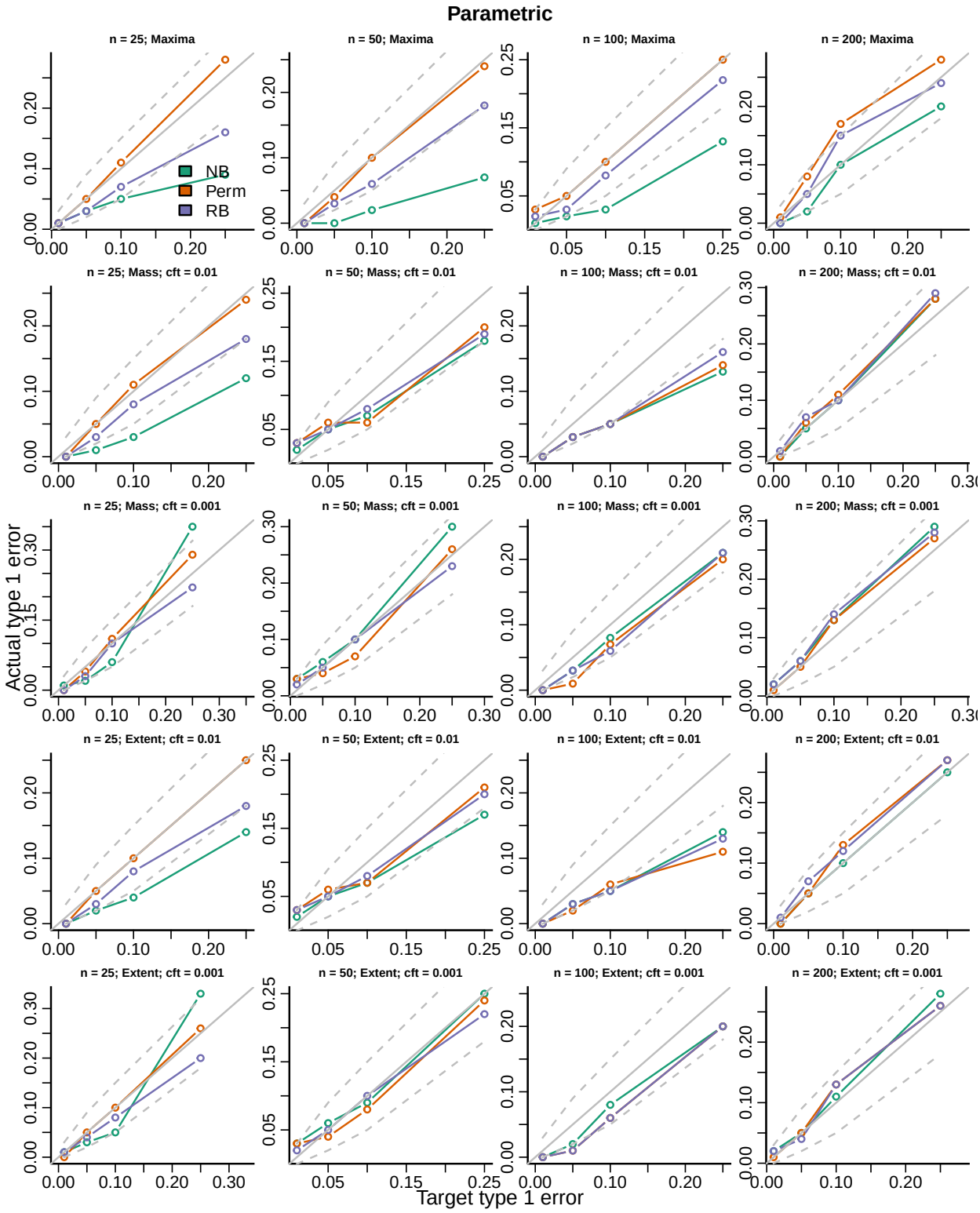

Figure 9: Actual versus target type 1 error rates for the inference procedures considered for testing the marginal distribution of each topological feature (TF) of the parametric test statistics image.

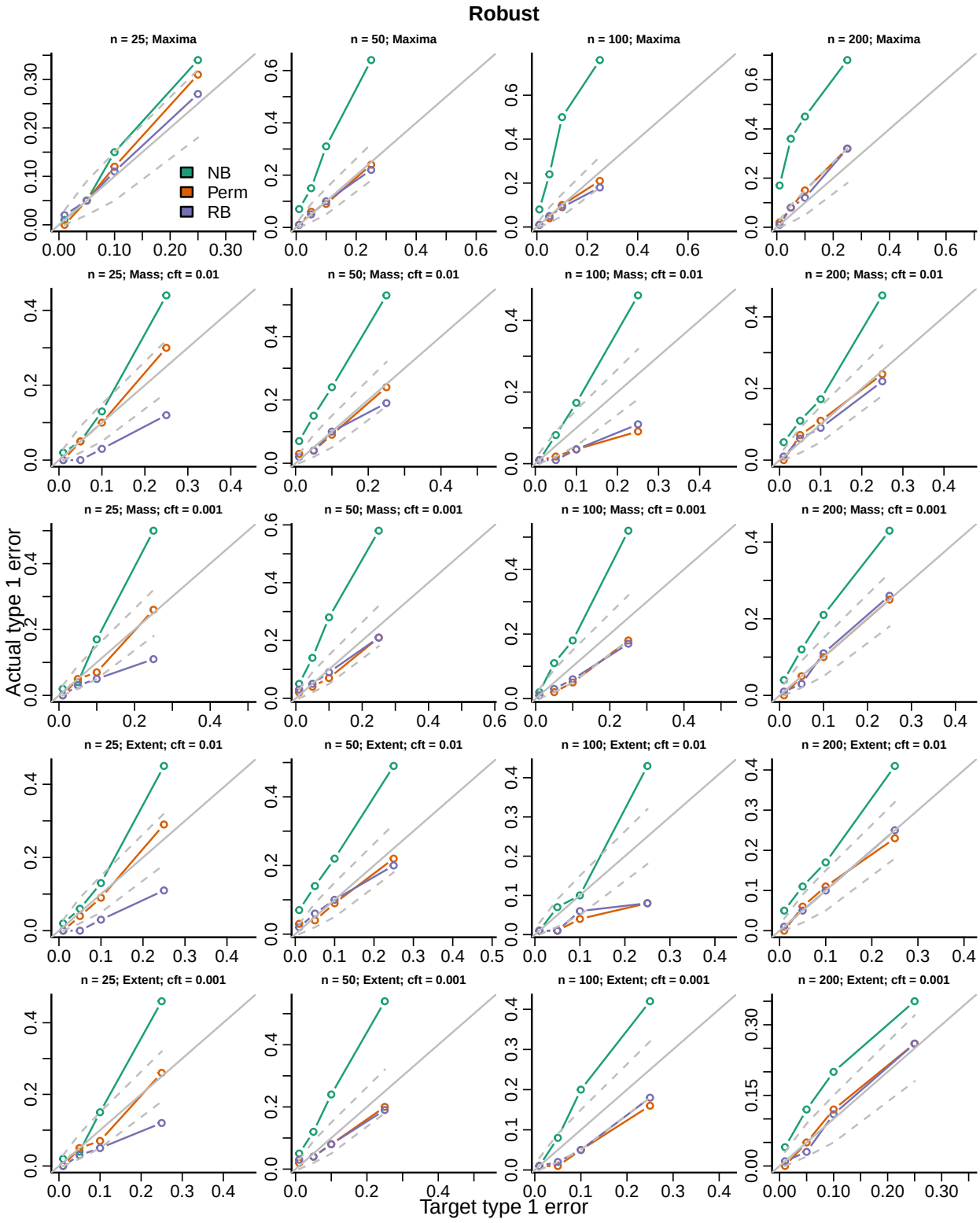

Figure 10: Actual versus target type 1 error rates for the inference procedures considered for testing the marginal distribution of each topological feature (TF) of the robust test statistics image.

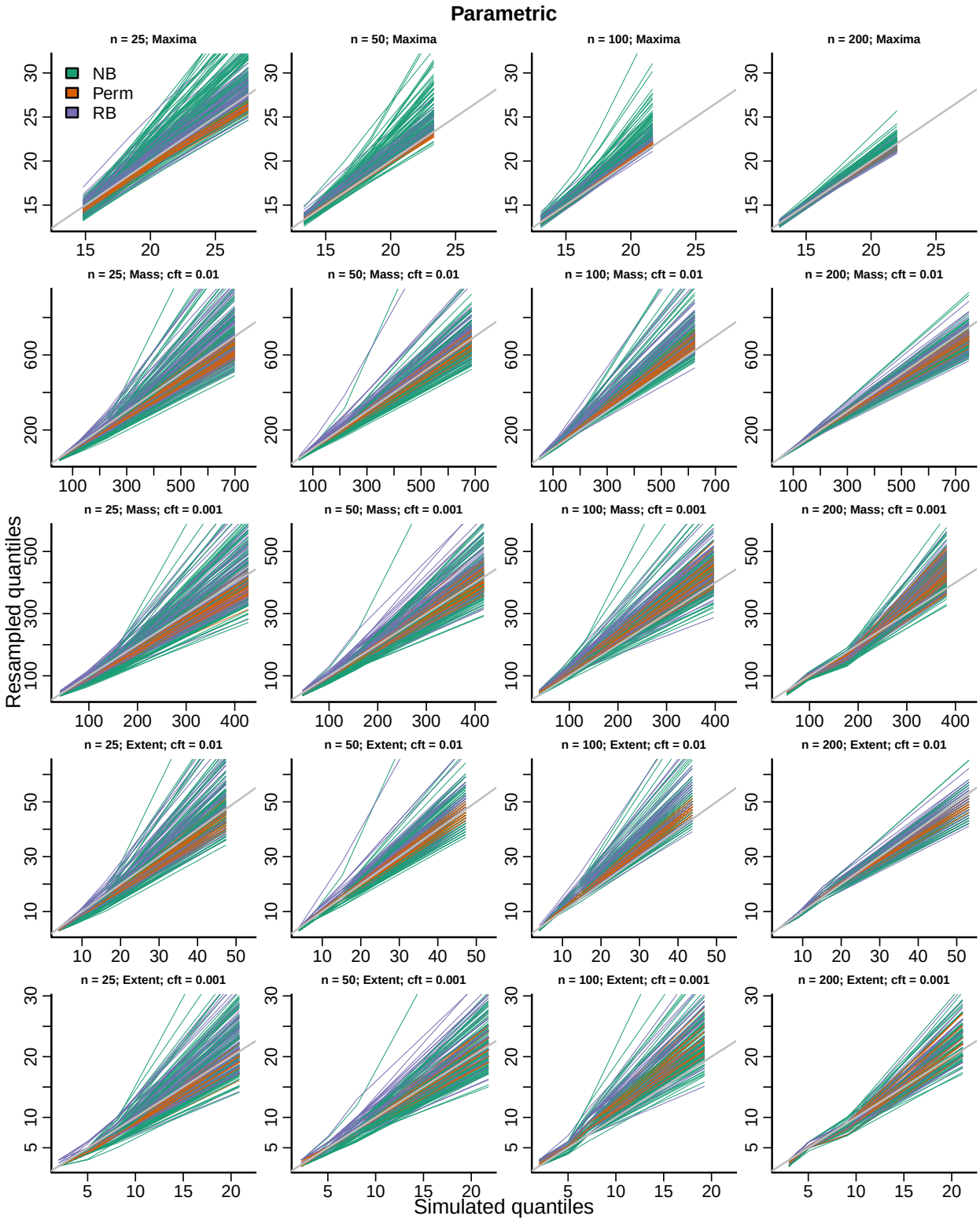

Figure 11: QQ-plot for the inference procedures considered for the marginal distribution of each topological feature (TF) of the parametric test statistics image.

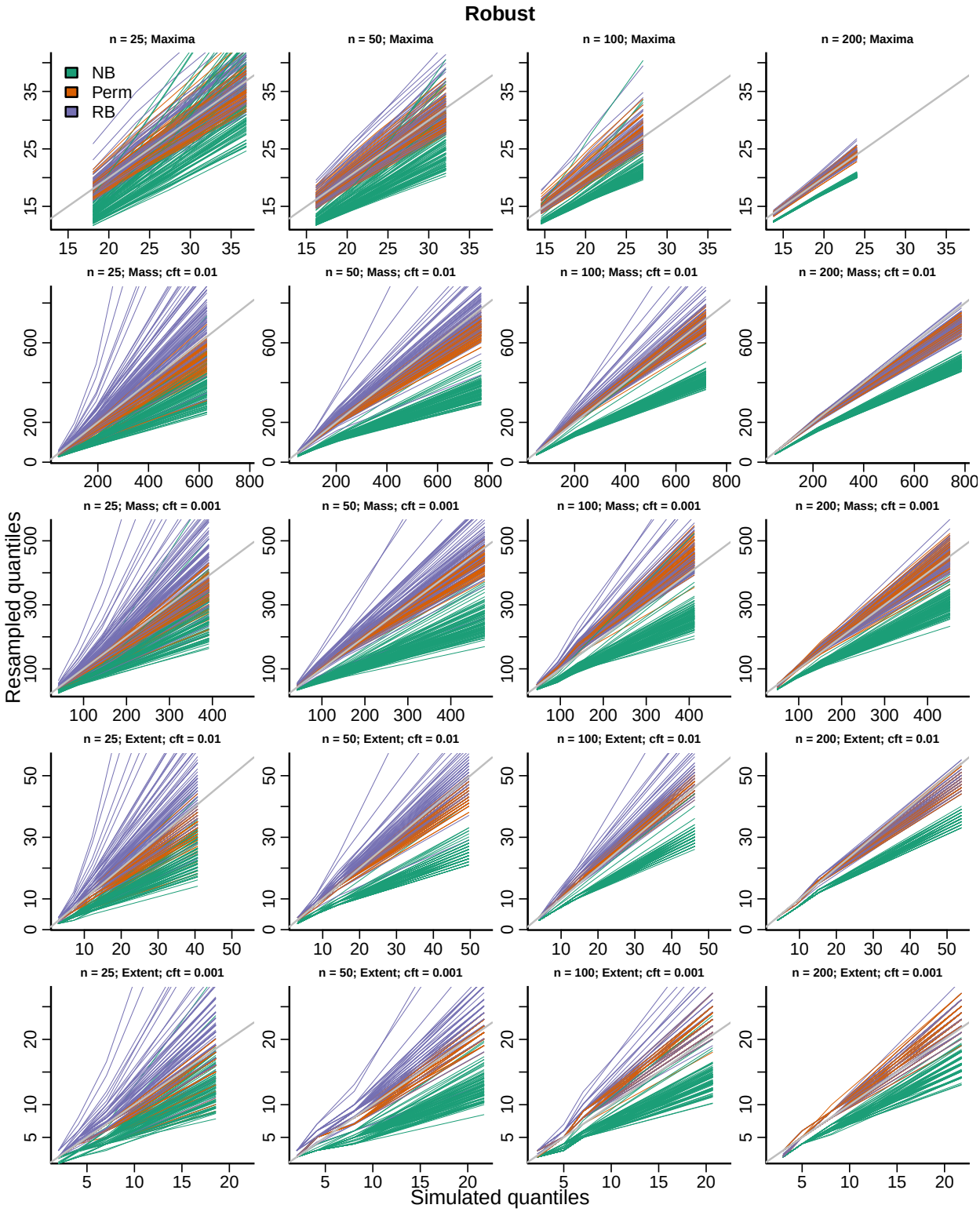

Figure 12: QQ-plot for the inference procedures considered for the marginal distribution of each topological feature (TF) of the robust test statistics image.

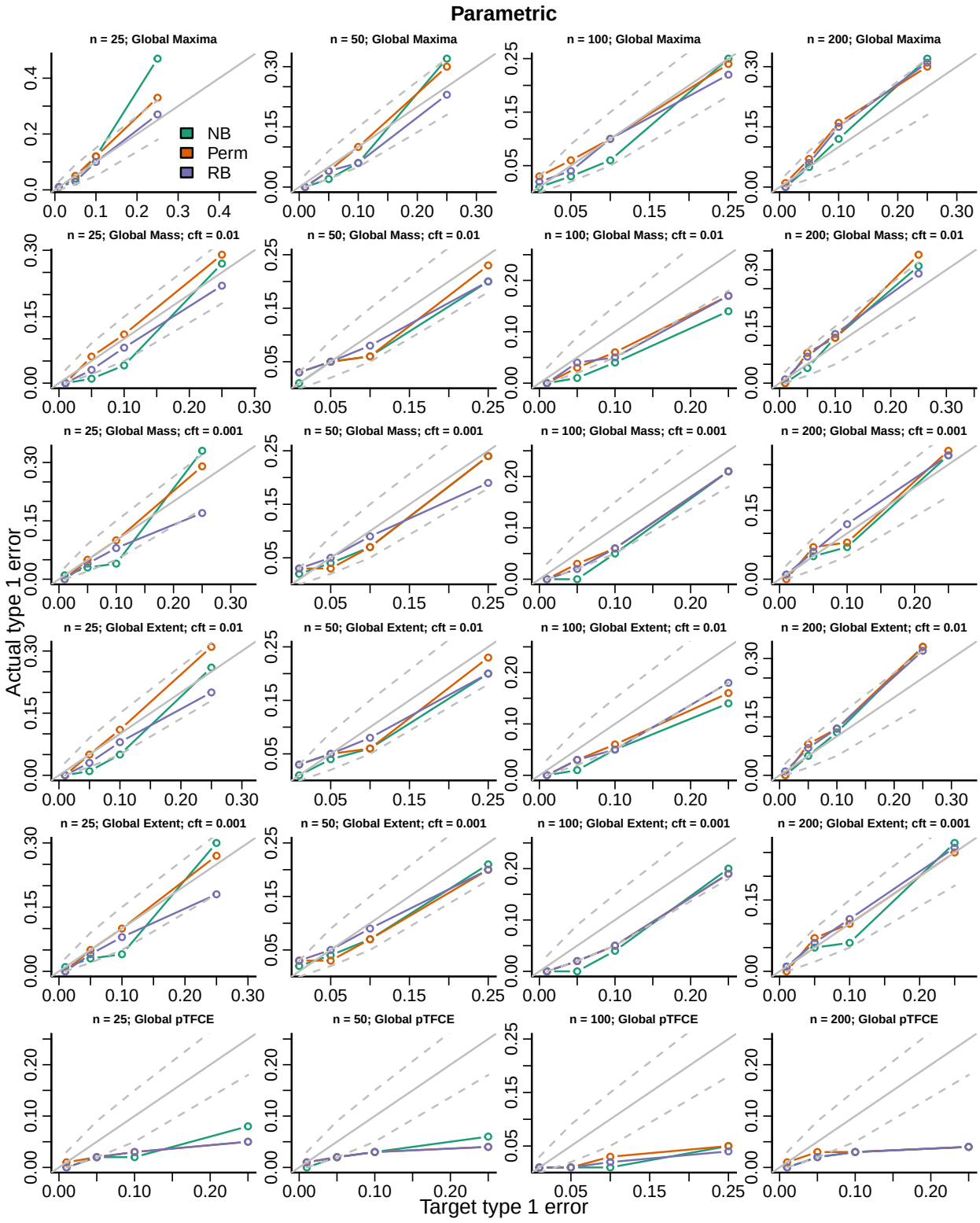

Figure 13: Actual versus target type 1 error rates for the inference procedures considered for testing the distribution of the global maximum of each topological feature (TF) of the parametric test statistics image.

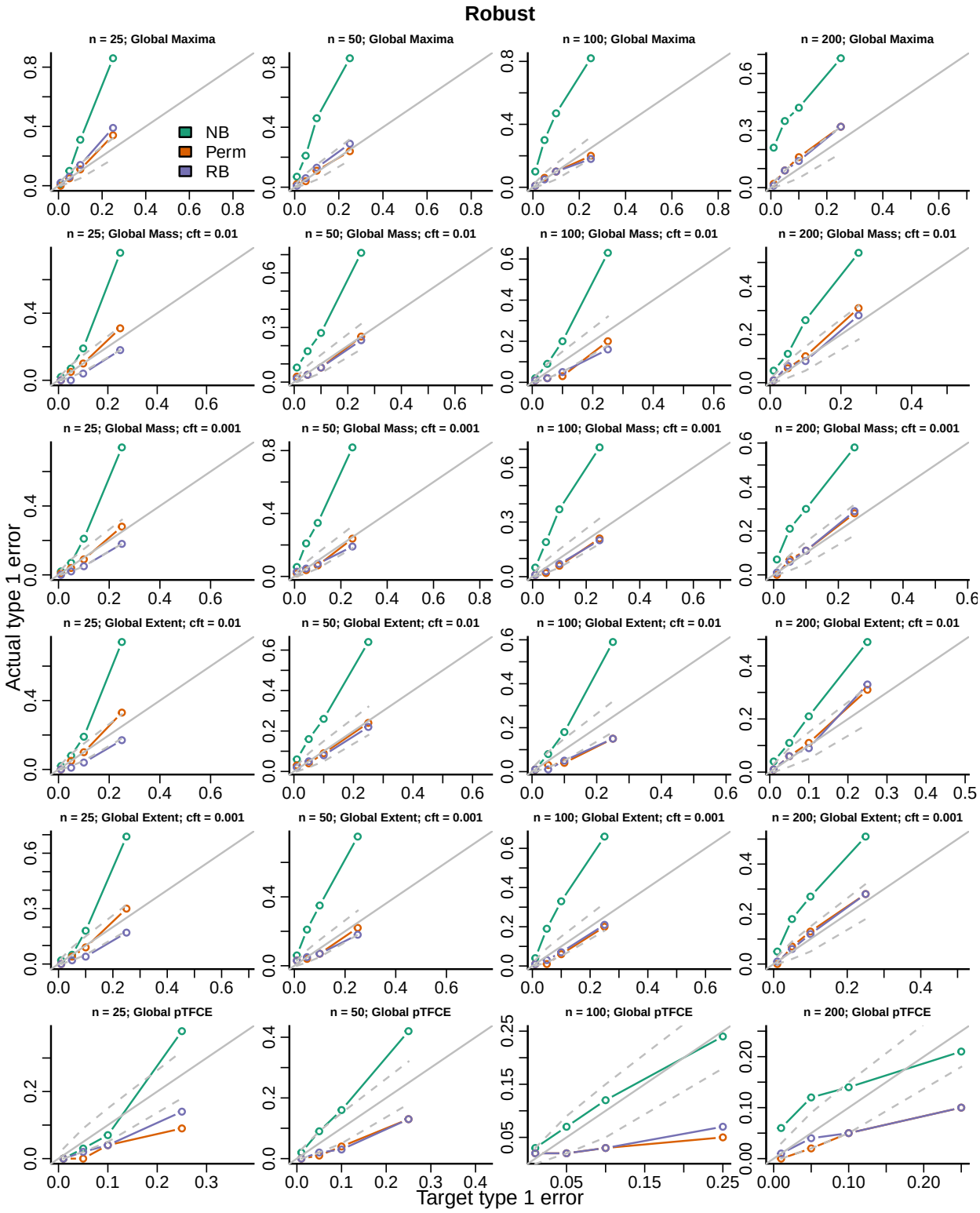

Figure 14: Actual versus target type 1 error rates for the inference procedures considered for testing the distribution of the global maximum of each topological feature (TF) of the robust test statistics image.

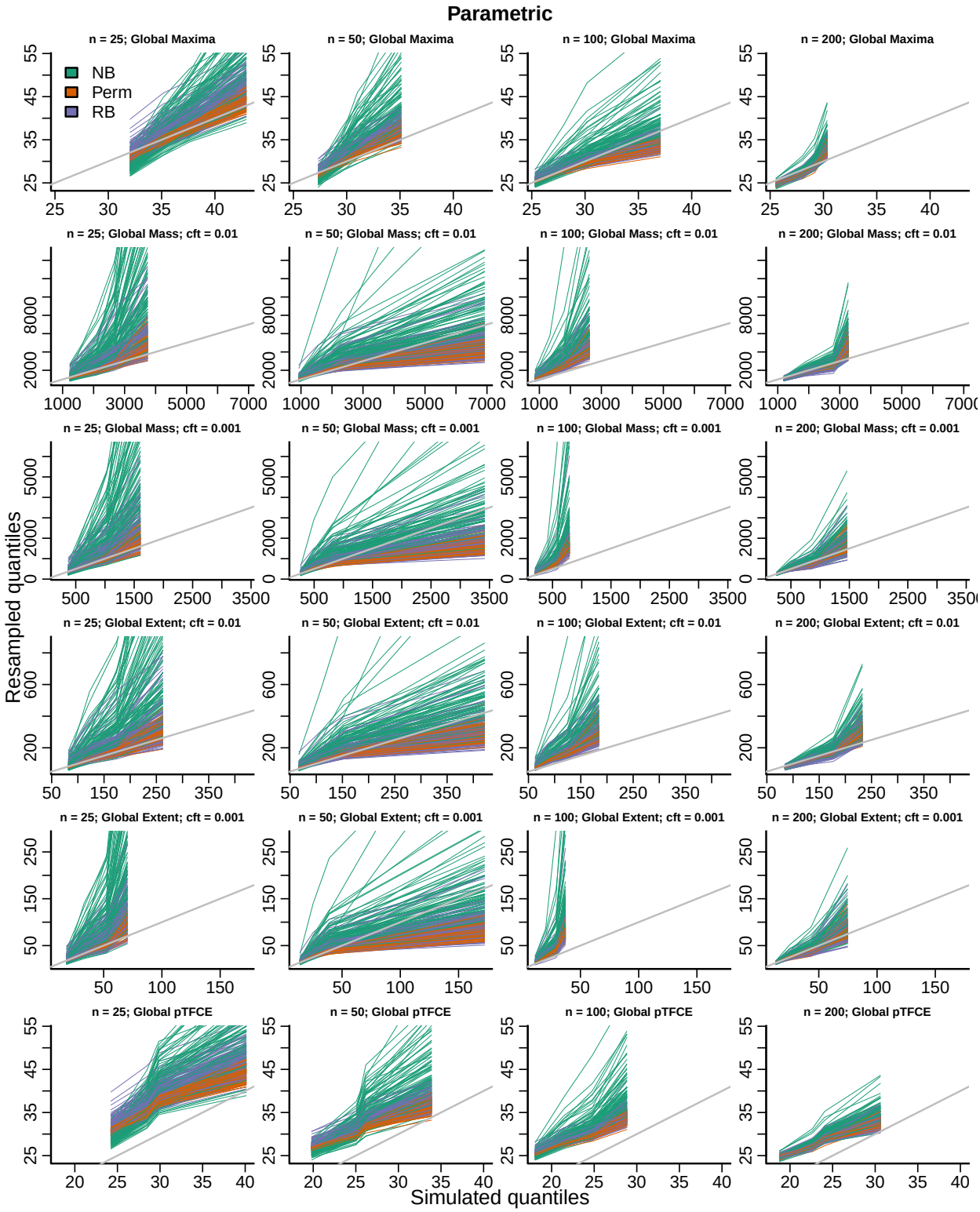

Figure 15: QQ-plot for the inference procedures considered for the distribution of the global maximum of each topological feature (TF) of the parametric test statistics image.

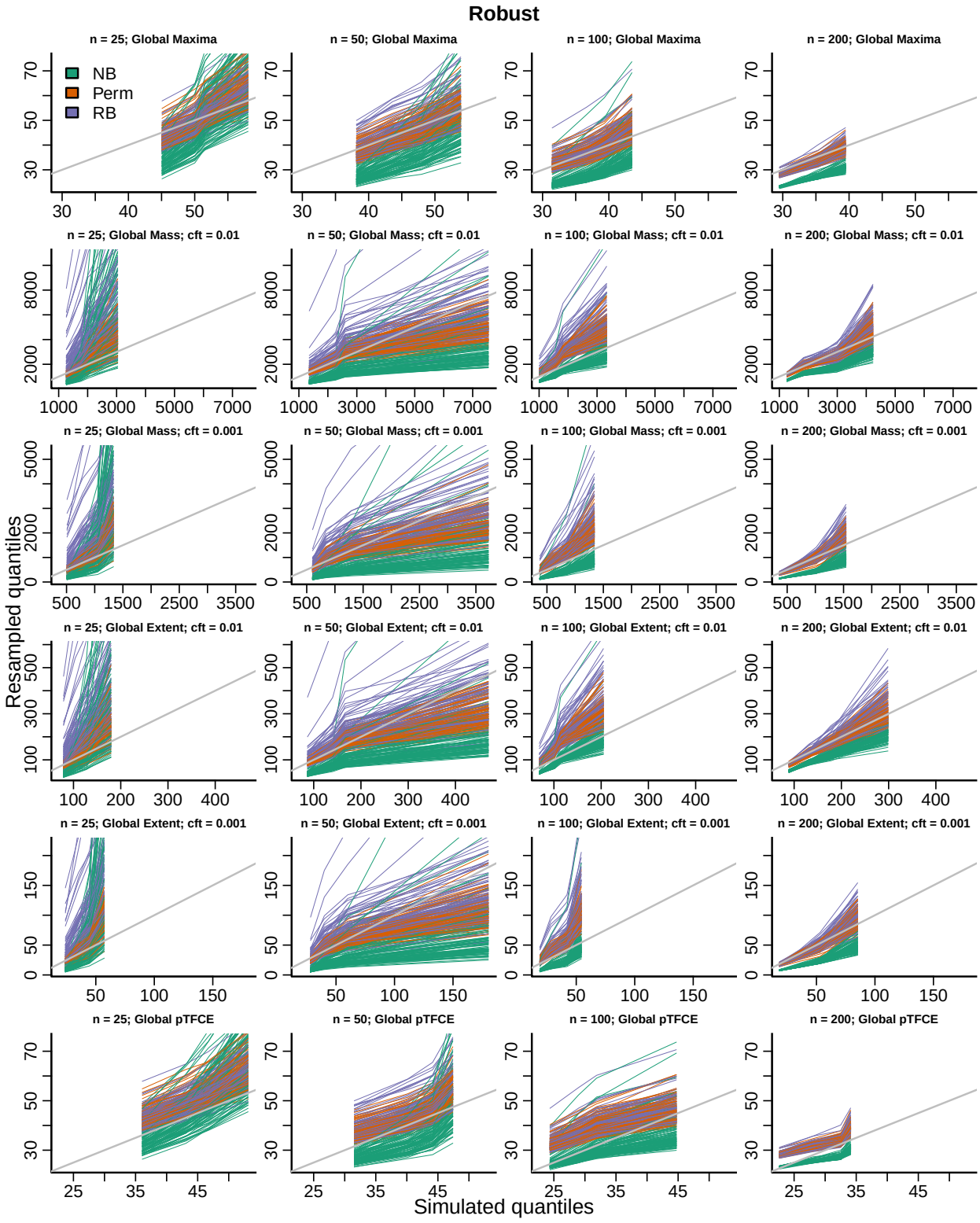

Figure 16: QQ-plot for the inference procedures considered for the distribution of the global maximum of each topological feature (TF) of the robust test statistics image.