Ptr	Truth	0Q	6Q	12Q	18Q	24Q	30Q
			Piecewise Linear, Inversion Filter, ME 0%				
φ_p	100	144.7 (121.3, 157.2) [43.9]	153.2 (131.2, 169.4) [53.9]	163.2 (140.8, 185.9) [66.1]	171.1 (154.2, 201.2) [75.9]	181.5 (165.5, 204.1) [83.8]	182.3 (168.2, 198.6) [83.8]
h	0.8	0.640 (0.611, 0.675) [0.160]	0.640 (0.606, 0.676) [0.161]	0.633 (0.595, 0.668) [0.169]	0.637 (0.611, 0.673) [0.167]	0.633 (0.586, 0.669) [0.169]	0.628 (0.596, 0.672) [0.172]
ρ_s	0.8	0.762 (0.727, 0.807) [0.043]	0.774 (0.730, 0.811) [0.034]	0.806 (0.754, 0.835) [0.023]	0.815 (0.784, 0.848) [0.027]	0.820 (0.798, 0.849) [0.026]	0.822 (0.784, 0.857) [0.028]
ρ_i	0.8	0.756 (0.714, 0.791) [0.049]	0.756 (0.708, 0.798) [0.054]	0.759 (0.726, 0.785) [0.044]	0.761 (0.682, 0.799) [0.051]	0.762 (0.725, 0.808) [0.046]	0.764 (0.733, 0.808) [0.041]
σ_g	0.0050	0.0051 (0.0044, 0.0058) [0.0005]	0.0053 (0.0047, 0.0068) [0.0006]	0.0056 (0.0047, 0.0066) [0.0010]	0.0057 (0.0051, 0.0079) [0.0012]	0.0058 (0.0051, 0.0074) [0.0012]	0.0059 (0.0050, 0.0069) [0.0011]
σ_s	0.0050	0.0050 (0.0042, 0.0063) [0.0007]	0.0050 (0.0041, 0.0063) [0.0007]	0.0048 (0.0038, 0.0058) [0.0007]	0.0047 (0.0031, 0.0058) [0.0009]	0.0045 (0.0037, 0.0053) [0.0007]	0.0045 (0.0036, 0.0056) [0.0007]
σ_i	0.0020	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0018, 0.0023) [0.0001]	0.0021 (0.0018, 0.0022) [0.0001]	0.0020 (0.0018, 0.0024) [0.0002]	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0019, 0.0024) [0.0002]
ϕ_π	2.0	2.024 (1.844, 2.177) [0.116]	1.950 (1.770, 2.154) [0.139]	2.011 (1.783, 2.164) [0.117]	1.973 (1.734, 2.229) [0.151]	1.948 (1.689, 2.189) [0.162]	1.948 (1.778, 2.140) [0.126]
ϕ_y	0.5	0.325 (0.175, 0.473) [0.204]	0.335 (0.170, 0.528) [0.184]	0.388 (0.235, 0.558) [0.148]	0.364 (0.197, 0.522) [0.176]	0.404 (0.210, 0.624) [0.143]	0.437 (0.279, 0.611) [0.124]
Σ		[1.527]	[1.633]	[1.706]	[2.013]	[1.982]	[1.907]
N		50	50	50	50	50	50
			Global, Particle Filter, ME 5%				
φ_p	100	152.7 (134.1, 165.8) [52.0]	160.6 (143.0, 179.2) [61.9]	170.7 (153.9, 190.6) [72.6]	180.3 (161.0, 201.5) [81.5]	186.5 (162.6, 203.3) [87.1]	187.6 (174.4, 202.6) [89.0]
h	0.8	0.662 (0.620, 0.695) [0.141]	0.662 (0.611, 0.710) [0.139]	0.670 (0.619, 0.701) [0.135]	0.678 (0.631, 0.706) [0.129]	0.684 (0.636, 0.715) [0.121]	0.678 (0.644, 0.716) [0.125]
ρ_s	0.8	0.758 (0.717, 0.797) [0.050]	0.773 (0.741, 0.807) [0.035]	0.794 (0.752, 0.824) [0.023]	0.801 (0.768, 0.840) [0.025]	0.806 (0.778, 0.839) [0.017]	0.807 (0.782, 0.843) [0.021]
ρ_i	0.8	0.783 (0.752, 0.823) [0.026]	0.797 (0.747, 0.824) [0.031]	0.795 (0.767, 0.825) [0.019]	0.808 (0.759, 0.830) [0.023]	0.807 (0.760, 0.842) [0.025]	0.803 (0.754, 0.839) [0.025]
σ_g	0.0050	0.0032 (0.0023, 0.0039) [0.0018]	0.0031 (0.0023, 0.0041) [0.0019]	0.0034 (0.0024, 0.0044) [0.0017]	0.0037 (0.0027, 0.0049) [0.0014]	0.0038 (0.0027, 0.0047) [0.0014]	0.0040 (0.0030, 0.0052) [0.0012]
σ_s	0.0050	0.0051 (0.0040, 0.0066) [0.0007]	0.0050 (0.0042, 0.0068) [0.0007]	0.0050 (0.0040, 0.0060) [0.0007]	0.0052 (0.0034, 0.0064) [0.0009]	0.0051 (0.0040, 0.0062) [0.0006]	0.0051 (0.0040, 0.0062) [0.0007]
σ_i	0.0020	0.0017 (0.0014, 0.0020) [0.0003]	0.0017 (0.0014, 0.0019) [0.0004]	0.0016 (0.0013, 0.0019) [0.0004]	0.0016 (0.0013, 0.0019) [0.0005]	0.0016 (0.0012, 0.0018) [0.0005]	0.0015 (0.0013, 0.0019) [0.0005]
ϕ_π	2.0	2.048 (1.865, 2.191) [0.128]	2.075 (1.869, 2.245) [0.144]	2.119 (1.941, 2.324) [0.165]	2.124 (1.902, 2.409) [0.190]	2.116 (1.844, 2.302) [0.162]	2.118 (1.939, 2.307) [0.173]
ϕ_y	0.5	0.332 (0.213, 0.544) [0.180]	0.382 (0.221, 0.620) [0.154]	0.403 (0.271, 0.613) [0.135]	0.399 (0.258, 0.532) [0.136]	0.398 (0.271, 0.586) [0.131]	0.404 (0.279, 0.627) [0.141]
Σ		[1.897]	[1.964]	[1.988]	[2.116]	[2.070]	[2.080]
N		50	50	48	50	36	49

Table 1: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	0Q	6Q	12Q	18Q	24Q	30Q
				Level Linear, Kalman Filter, ME 5%			
φ_p	100	154.0 (133.4, 165.9) [52.2]	160.9 (142.1, 179.5) [62.2]	171.8 (153.1, 198.9) [76.0]	184.3 (163.1, 208.7) [84.1]	193.3 (172.6, 211.0) [91.7]	191.2 (174.7, 204.3) [92.0]
h	0.8	0.662 (0.618, 0.692) [0.142]	0.660 (0.608, 0.708) [0.141]	0.671 (0.617, 0.713) [0.135]	0.670 (0.625, 0.705) [0.133]	0.677 (0.636, 0.710) [0.128]	0.668 (0.629, 0.702) [0.135]
ρ_s	0.8	0.762 (0.716, 0.802) [0.047]	0.780 (0.739, 0.813) [0.031]	0.800 (0.753, 0.826) [0.022]	0.807 (0.779, 0.846) [0.027]	0.821 (0.792, 0.848) [0.027]	0.823 (0.784, 0.856) [0.032]
ρ_i	0.8	0.785 (0.752, 0.823) [0.025]	0.801 (0.745, 0.830) [0.029]	0.812 (0.777, 0.841) [0.023]	0.824 (0.779, 0.862) [0.036]	0.831 (0.801, 0.878) [0.042]	0.844 (0.800, 0.876) [0.046]
σ_g	0.0050	0.0032 (0.0023, 0.0039) [0.0018]	0.0032 (0.0025, 0.0041) [0.0018]	0.0036 (0.0027, 0.0045) [0.0015]	0.0040 (0.0029, 0.0052) [0.0012]	0.0042 (0.0030, 0.0054) [0.0011]	0.0043 (0.0030, 0.0057) [0.0010]
σ_s	0.0050	0.0052 (0.0040, 0.0066) [0.0008]	0.0051 (0.0041, 0.0068) [0.0007]	0.0052 (0.0041, 0.0062) [0.0007]	0.0049 (0.0033, 0.0063) [0.0009]	0.0047 (0.0039, 0.0059) [0.0006]	0.0047 (0.0037, 0.0061) [0.0007]
σ_i	0.0020	0.0017 (0.0015, 0.0020) [0.0003]	0.0016 (0.0014, 0.0019) [0.0004]	0.0017 (0.0014, 0.0020) [0.0003]	0.0016 (0.0012, 0.0019) [0.0004]	0.0017 (0.0014, 0.0020) [0.0004]	0.0016 (0.0014, 0.0019) [0.0004]
ϕ_π	2.0	2.056 (1.877, 2.201) [0.123]	1.994 (1.720, 2.210) [0.147]	1.886 (1.667, 2.092) [0.166]	1.831 (1.612, 2.086) [0.228]	1.695 (1.526, 1.927) [0.310]	1.740 (1.520, 1.917) [0.299]
ϕ_y	0.5	0.339 (0.220, 0.533) [0.177]	0.341 (0.201, 0.556) [0.178]	0.329 (0.142, 0.537) [0.210]	0.298 (0.181, 0.493) [0.215]	0.296 (0.195, 0.459) [0.211]	0.306 (0.166, 0.464) [0.199]
Σ		[1.882]	[2.012]	[2.109]	[2.267]	[2.275]	[2.279]
N		50	50	50	50	50	50
				Global, Particle Filter, ME 5%			
φ_p	100	152.7 (134.1, 165.8) [52.0]	160.6 (143.0, 179.2) [61.9]	170.7 (153.9, 190.6) [72.6]	180.3 (161.0, 201.5) [81.5]	186.5 (162.6, 203.3) [87.1]	187.6 (174.4, 202.6) [89.0]
h	0.8	0.662 (0.620, 0.695) [0.141]	0.662 (0.611, 0.710) [0.139]	0.670 (0.619, 0.701) [0.135]	0.678 (0.631, 0.706) [0.129]	0.684 (0.636, 0.715) [0.121]	0.678 (0.644, 0.716) [0.125]
ρ_s	0.8	0.758 (0.717, 0.797) [0.050]	0.773 (0.741, 0.807) [0.035]	0.794 (0.752, 0.824) [0.023]	0.801 (0.768, 0.840) [0.025]	0.806 (0.778, 0.839) [0.017]	0.807 (0.782, 0.843) [0.021]
ρ_i	0.8	0.783 (0.752, 0.823) [0.026]	0.797 (0.747, 0.824) [0.031]	0.795 (0.767, 0.825) [0.019]	0.808 (0.759, 0.830) [0.023]	0.807 (0.760, 0.842) [0.025]	0.803 (0.754, 0.839) [0.025]
σ_g	0.0050	0.0032 (0.0023, 0.0039) [0.0018]	0.0031 (0.0023, 0.0041) [0.0019]	0.0034 (0.0024, 0.0044) [0.0017]	0.0037 (0.0027, 0.0049) [0.0014]	0.0038 (0.0027, 0.0047) [0.0014]	0.0040 (0.0030, 0.0052) [0.0012]
σ_s	0.0050	0.0051 (0.0040, 0.0066) [0.0007]	0.0050 (0.0042, 0.0068) [0.0007]	0.0050 (0.0040, 0.0060) [0.0007]	0.0052 (0.0034, 0.0064) [0.0009]	0.0051 (0.0040, 0.0062) [0.0006]	0.0051 (0.0040, 0.0062) [0.0007]
σ_i	0.0020	0.0017 (0.0014, 0.0020) [0.0003]	0.0017 (0.0014, 0.0019) [0.0004]	0.0016 (0.0013, 0.0019) [0.0004]	0.0016 (0.0013, 0.0019) [0.0005]	0.0016 (0.0012, 0.0018) [0.0005]	0.0015 (0.0013, 0.0019) [0.0005]
ϕ_π	2.0	2.048 (1.865, 2.191) [0.128]	2.075 (1.869, 2.245) [0.144]	2.119 (1.941, 2.324) [0.165]	2.124 (1.902, 2.409) [0.190]	2.116 (1.844, 2.302) [0.162]	2.118 (1.939, 2.307) [0.173]
ϕ_y	0.5	0.332 (0.213, 0.544) [0.180]	0.382 (0.221, 0.620) [0.154]	0.403 (0.271, 0.613) [0.135]	0.399 (0.258, 0.532) [0.136]	0.398 (0.271, 0.586) [0.131]	0.404 (0.279, 0.627) [0.141]
Σ		[1.897]	[1.964]	[1.988]	[2.116]	[2.070]	[2.080]
N		50	50	48	50	36	49

Table 2: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	0Q	6Q	12Q	18Q	24Q	30Q
			Piecewise Linear, Inversion Filter, ME 0%				
φ_p	100	144.7 (121.3, 157.2) [43.9]	153.2 (131.2, 169.4) [53.9]	163.2 (140.8, 185.9) [66.1]	171.1 (154.2, 201.2) [75.9]	181.5 (165.5, 204.1) [83.8]	182.3 (168.2, 198.6) [83.8]
h	0.8	0.640 (0.611, 0.675) [0.160]	0.640 (0.606, 0.676) [0.161]	0.633 (0.595, 0.668) [0.169]	0.637 (0.611, 0.673) [0.167]	0.633 (0.586, 0.669) [0.169]	0.628 (0.596, 0.672) [0.172]
ρ_s	0.8	0.762 (0.727, 0.807) [0.043]	0.774 (0.730, 0.811) [0.034]	0.806 (0.754, 0.835) [0.023]	0.815 (0.784, 0.848) [0.027]	0.820 (0.798, 0.849) [0.026]	0.822 (0.784, 0.857) [0.028]
ρ_i	0.8	0.756 (0.714, 0.791) [0.049]	0.756 (0.708, 0.798) [0.054]	0.759 (0.726, 0.785) [0.044]	0.761 (0.682, 0.799) [0.051]	0.762 (0.725, 0.808) [0.046]	0.764 (0.733, 0.808) [0.041]
σ_g	0.0050	0.0051 (0.0044, 0.0058) [0.0005]	0.0053 (0.0047, 0.0068) [0.0006]	0.0056 (0.0047, 0.0066) [0.0010]	0.0057 (0.0051, 0.0079) [0.0012]	0.0058 (0.0051, 0.0074) [0.0012]	0.0059 (0.0050, 0.0069) [0.0011]
σ_s	0.0050	0.0050 (0.0042, 0.0063) [0.0007]	0.0050 (0.0041, 0.0063) [0.0007]	0.0048 (0.0038, 0.0058) [0.0007]	0.0047 (0.0031, 0.0058) [0.0009]	0.0045 (0.0037, 0.0053) [0.0007]	0.0045 (0.0036, 0.0056) [0.0007]
σ_i	0.0020	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0018, 0.0023) [0.0001]	0.0021 (0.0018, 0.0022) [0.0001]	0.0020 (0.0018, 0.0024) [0.0002]	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0019, 0.0024) [0.0002]
ϕ_π	2.0	2.024 (1.844, 2.177) [0.116]	1.950 (1.770, 2.154) [0.139]	2.011 (1.783, 2.164) [0.117]	1.973 (1.734, 2.229) [0.151]	1.948 (1.689, 2.189) [0.162]	1.948 (1.778, 2.140) [0.126]
ϕ_y	0.5	0.325 (0.175, 0.473) [0.204]	0.335 (0.170, 0.528) [0.184]	0.388 (0.235, 0.558) [0.148]	0.364 (0.197, 0.522) [0.176]	0.404 (0.210, 0.624) [0.143]	0.437 (0.279, 0.611) [0.124]
Σ		[1.527]	[1.633]	[1.706]	[2.013]	[1.982]	[1.907]
N		50	50	50	50	50	50
			Level Linear, Kalman Filter, ME 0%				
φ_p	100	144.7 (125.9, 157.7) [44.2]	153.1 (134.5, 168.5) [54.4]	164.2 (147.3, 196.3) [68.9]	175.1 (157.3, 205.0) [78.8]	184.5 (165.2, 204.9) [87.3]	184.4 (168.4, 201.2) [87.5]
h	0.8	0.641 (0.612, 0.676) [0.159]	0.640 (0.604, 0.684) [0.160]	0.640 (0.602, 0.674) [0.164]	0.641 (0.616, 0.672) [0.161]	0.636 (0.596, 0.672) [0.164]	0.631 (0.596, 0.672) [0.171]
ρ_s	0.8	0.761 (0.720, 0.800) [0.047]	0.777 (0.737, 0.804) [0.034]	0.797 (0.758, 0.830) [0.021]	0.808 (0.763, 0.843) [0.023]	0.818 (0.795, 0.848) [0.026]	0.825 (0.795, 0.851) [0.029]
ρ_i	0.8	0.759 (0.727, 0.788) [0.045]	0.769 (0.715, 0.802) [0.043]	0.779 (0.751, 0.809) [0.029]	0.789 (0.737, 0.840) [0.028]	0.789 (0.766, 0.847) [0.025]	0.809 (0.766, 0.852) [0.027]
σ_g	0.0050	0.0050 (0.0043, 0.0054) [0.0004]	0.0051 (0.0045, 0.0058) [0.0004]	0.0055 (0.0048, 0.0067) [0.0008]	0.0057 (0.0051, 0.0067) [0.0009]	0.0059 (0.0049, 0.0071) [0.0012]	0.0059 (0.0051, 0.0068) [0.0011]
σ_s	0.0050	0.0050 (0.0043, 0.0064) [0.0007]	0.0050 (0.0042, 0.0062) [0.0007]	0.0049 (0.0040, 0.0058) [0.0006]	0.0048 (0.0035, 0.0059) [0.0007]	0.0044 (0.0038, 0.0053) [0.0007]	0.0045 (0.0036, 0.0052) [0.0008]
σ_i	0.0020	0.0020 (0.0018, 0.0022) [0.0001]	0.0020 (0.0018, 0.0022) [0.0001]	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0016, 0.0022) [0.0002]	0.0020 (0.0017, 0.0022) [0.0002]	0.0019 (0.0017, 0.0022) [0.0002]
ϕ_π	2.0	2.023 (1.843, 2.157) [0.112]	1.949 (1.712, 2.164) [0.146]	1.848 (1.600, 2.076) [0.197]	1.777 (1.505, 2.040) [0.275]	1.642 (1.419, 1.917) [0.377]	1.676 (1.458, 1.880) [0.342]
ϕ_y	0.5	0.330 (0.182, 0.483) [0.198]	0.318 (0.197, 0.526) [0.203]	0.284 (0.110, 0.480) [0.241]	0.257 (0.138, 0.429) [0.256]	0.240 (0.147, 0.372) [0.258]	0.271 (0.170, 0.434) [0.233]
Σ		[1.491]	[1.616]	[1.885]	[2.100]	[2.303]	[2.236]
N		50	50	50	50	50	50

Table 3: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	0Q	6Q	12Q	18Q	24Q	30Q
No misspecification, Piecewise Linear, Inversion Filter, ME 0%							
φ_p	100	93.9 (81.1, 108.3) [10.6]	96.2 (81.7, 115.2) [11.5]	98.9 (88.2, 116.9) [9.5]	107.7 (92.7, 119.5) [11.4]	108.6 (90.4, 123.5) [13.7]	110.2 (95.4, 125.0) [14.8]
h	0.8	0.792 (0.754, 0.816) [0.019]	0.793 (0.761, 0.825) [0.021]	0.793 (0.765, 0.821) [0.018]	0.792 (0.760, 0.825) [0.020]	0.798 (0.765, 0.816) [0.016]	0.794 (0.770, 0.820) [0.017]
ρ_s	0.8	0.808 (0.757, 0.849) [0.030]	0.811 (0.773, 0.855) [0.027]	0.820 (0.756, 0.861) [0.035]	0.829 (0.787, 0.863) [0.037]	0.833 (0.796, 0.862) [0.037]	0.835 (0.798, 0.874) [0.045]
ρ_i	0.8	0.795 (0.766, 0.822) [0.018]	0.797 (0.752, 0.821) [0.023]	0.791 (0.754, 0.818) [0.023]	0.796 (0.766, 0.825) [0.019]	0.791 (0.762, 0.827) [0.022]	0.790 (0.737, 0.819) [0.026]
σ_g	0.0050	0.0050 (0.0044, 0.0056) [0.0004]	0.0049 (0.0043, 0.0060) [0.0005]	0.0050 (0.0043, 0.0059) [0.0005]	0.0050 (0.0044, 0.0060) [0.0004]	0.0051 (0.0041, 0.0058) [0.0005]	0.0051 (0.0043, 0.0061) [0.0006]
σ_s	0.0050	0.0049 (0.0039, 0.0060) [0.0008]	0.0050 (0.0043, 0.0062) [0.0006]	0.0049 (0.0040, 0.0071) [0.0009]	0.0046 (0.0038, 0.0059) [0.0008]	0.0047 (0.0039, 0.0058) [0.0007]	0.0047 (0.0034, 0.0058) [0.0008]
σ_i	0.0020	0.0020 (0.0017, 0.0022) [0.0001]	0.0020 (0.0018, 0.0023) [0.0001]	0.0020 (0.0018, 0.0023) [0.0001]	0.0020 (0.0017, 0.0023) [0.0002]	0.0021 (0.0018, 0.0023) [0.0002]	0.0020 (0.0016, 0.0022) [0.0002]
ϕ_π	2.0	1.966 (1.743, 2.143) [0.128]	1.942 (1.592, 2.162) [0.175]	1.941 (1.710, 2.143) [0.146]	1.887 (1.646, 2.083) [0.170]	1.875 (1.612, 2.070) [0.193]	1.812 (1.579, 2.060) [0.246]
ϕ_y	0.5	0.463 (0.299, 0.628) [0.105]	0.504 (0.328, 0.650) [0.100]	0.528 (0.350, 0.727) [0.122]	0.548 (0.390, 0.750) [0.119]	0.539 (0.372, 0.720) [0.124]	0.517 (0.312, 0.730) [0.114]
Σ		[0.780]	[0.796]	[0.859]	[0.859]	[0.890]	[0.986]
N		50	50	50	50	50	50
No misspecification, Level Linear, Kalman Filter, ME 0%							
φ_p	100	92.7 (82.0, 107.9) [10.9]	96.5 (80.7, 116.1) [11.8]	104.2 (83.9, 121.7) [11.8]	110.2 (92.1, 125.1) [14.0]	112.2 (94.4, 131.7) [17.5]	121.6 (100.9, 136.9) [22.7]
h	0.8	0.793 (0.753, 0.817) [0.019]	0.793 (0.761, 0.824) [0.021]	0.793 (0.763, 0.821) [0.018]	0.794 (0.754, 0.822) [0.020]	0.795 (0.767, 0.817) [0.016]	0.792 (0.769, 0.815) [0.016]
ρ_s	0.8	0.808 (0.755, 0.836) [0.029]	0.810 (0.774, 0.853) [0.027]	0.827 (0.763, 0.866) [0.038]	0.835 (0.798, 0.874) [0.041]	0.841 (0.809, 0.869) [0.046]	0.852 (0.813, 0.883) [0.058]
ρ_i	0.8	0.795 (0.764, 0.821) [0.018]	0.808 (0.767, 0.830) [0.019]	0.813 (0.771, 0.841) [0.023]	0.820 (0.796, 0.853) [0.027]	0.829 (0.804, 0.865) [0.037]	0.834 (0.805, 0.863) [0.040]
σ_g	0.0050	0.0049 (0.0044, 0.0056) [0.0004]	0.0048 (0.0042, 0.0060) [0.0005]	0.0050 (0.0042, 0.0058) [0.0005]	0.0050 (0.0043, 0.0056) [0.0004]	0.0050 (0.0041, 0.0057) [0.0004]	0.0050 (0.0041, 0.0057) [0.0005]
σ_s	0.0050	0.0050 (0.0039, 0.0060) [0.0008]	0.0049 (0.0041, 0.0061) [0.0006]	0.0047 (0.0038, 0.0066) [0.0009]	0.0046 (0.0037, 0.0061) [0.0008]	0.0044 (0.0037, 0.0054) [0.0008]	0.0043 (0.0031, 0.0051) [0.0010]
σ_i	0.0020	0.0020 (0.0017, 0.0022) [0.0001]	0.0019 (0.0018, 0.0022) [0.0001]	0.0020 (0.0018, 0.0022) [0.0001]	0.0019 (0.0017, 0.0021) [0.0002]	0.0020 (0.0017, 0.0021) [0.0002]	0.0019 (0.0016, 0.0021) [0.0002]
ϕ_π	2.0	1.954 (1.714, 2.167) [0.133]	1.936 (1.661, 2.131) [0.156]	1.890 (1.652, 2.089) [0.186]	1.775 (1.578, 2.007) [0.273]	1.709 (1.584, 1.915) [0.301]	1.610 (1.422, 1.844) [0.408]
ϕ_y	0.5	0.465 (0.323, 0.632) [0.107]	0.486 (0.312, 0.657) [0.105]	0.504 (0.330, 0.655) [0.102]	0.489 (0.388, 0.679) [0.099]	0.487 (0.321, 0.624) [0.098]	0.470 (0.317, 0.657) [0.103]
Σ		[0.779]	[0.781]	[0.845]	[0.919]	[0.970]	[1.184]
N		50	50	50	50	50	50

Table 4: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	Global-PF-ME 2%		Level Lin-KF-ME 2%		PW-IF-ME 0%	
		0Q	30Q	0Q	30Q	0Q	30Q
φ_p	100	152.0 (128.0, 165.6) [50.7]	190.6 (165.2, 206.1) [90.3]	152.4 (132.9, 165.3) [51.4]	194.2 (178.2, 209.1) [95.6]	144.7 (121.3, 157.2) [43.9]	182.3 (168.2, 198.6) [83.8]
h	0.8	0.650 (0.616, 0.685) [0.149]	0.667 (0.642, 0.714) [0.133]	0.657 (0.620, 0.688) [0.146]	0.656 (0.622, 0.697) [0.145]	0.640 (0.611, 0.675) [0.160]	0.628 (0.596, 0.672) [0.172]
ρ_s	0.8	0.754 (0.709, 0.802) [0.053]	0.800 (0.768, 0.851) [0.023]	0.760 (0.717, 0.798) [0.047]	0.821 (0.788, 0.853) [0.029]	0.762 (0.727, 0.807) [0.043]	0.822 (0.784, 0.857) [0.028]
ρ_i	0.8	0.765 (0.728, 0.808) [0.039]	0.785 (0.751, 0.831) [0.028]	0.770 (0.734, 0.801) [0.036]	0.828 (0.778, 0.862) [0.035]	0.756 (0.714, 0.791) [0.049]	0.764 (0.733, 0.808) [0.041]
σ_g	0.0050	0.0038 (0.0031, 0.0044) [0.0013]	0.0040 (0.0037, 0.0055) [0.0010]	0.0038 (0.0031, 0.0043) [0.0013]	0.0045 (0.0036, 0.0058) [0.0008]	0.0051 (0.0044, 0.0058) [0.0005]	0.0059 (0.0050, 0.0069) [0.0011]
σ_s	0.0050	0.0051 (0.0038, 0.0065) [0.0008]	0.0052 (0.0041, 0.0068) [0.0009]	0.0052 (0.0041, 0.0065) [0.0008]	0.0048 (0.0038, 0.0058) [0.0007]	0.0050 (0.0042, 0.0063) [0.0007]	0.0045 (0.0036, 0.0056) [0.0007]
σ_i	0.0020	0.0019 (0.0016, 0.0021) [0.0002]	0.0017 (0.0016, 0.0019) [0.0003]	0.0019 (0.0017, 0.0021) [0.0002]	0.0017 (0.0016, 0.0020) [0.0003]	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0019, 0.0024) [0.0002]
ϕ_π	2.0	2.017 (1.819, 2.174) [0.134]	2.201 (1.965, 2.319) [0.204]	2.033 (1.865, 2.171) [0.116]	1.704 (1.505, 1.906) [0.323]	2.024 (1.844, 2.177) [0.116]	1.948 (1.778, 2.140) [0.126]
ϕ_y	0.5	0.317 (0.183, 0.440) [0.204]	0.410 (0.225, 0.761) [0.175]	0.308 (0.179, 0.485) [0.203]	0.265 (0.144, 0.394) [0.241]	0.325 (0.175, 0.473) [0.204]	0.437 (0.279, 0.611) [0.124]
Σ		[1.803]	[2.092]	[1.770]	[2.281]	[1.527]	[1.907]
N		37	12	50	50	50	50

Table 5: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	Global-PF-ME 10%		Level Lin-KF-ME 10%		PW-IF-ME 0%	
		0Q	30Q	0Q	30Q	0Q	30Q
φ_p	100	149.0 (133.1, 160.3) [49.1]	188.0 (181.9, 194.1) [88.1]	151.5 (133.8, 162.8) [50.6]	185.0 (172.1, 202.0) [86.4]	144.7 (121.3, 157.2) [43.9]	182.3 (168.2, 198.6) [83.8]
h	0.8	0.661 (0.615, 0.688) [0.143]	0.694 (0.679, 0.708) [0.107]	0.667 (0.614, 0.694) [0.139]	0.677 (0.639, 0.712) [0.125]	0.640 (0.611, 0.675) [0.160]	0.628 (0.596, 0.672) [0.172]
ρ_s	0.8	0.760 (0.717, 0.791) [0.049]	0.801 (0.787, 0.823) [0.014]	0.762 (0.718, 0.798) [0.046]	0.823 (0.786, 0.859) [0.035]	0.762 (0.727, 0.807) [0.043]	0.822 (0.784, 0.857) [0.028]
ρ_i	0.8	0.806 (0.769, 0.838) [0.022]	0.779 (0.754, 0.802) [0.028]	0.804 (0.771, 0.836) [0.021]	0.855 (0.817, 0.888) [0.057]	0.756 (0.714, 0.791) [0.049]	0.764 (0.733, 0.808) [0.041]
σ_g	0.0050	0.0027 (0.0018, 0.0036) [0.0024]	0.0045 (0.0030, 0.0052) [0.0011]	0.0028 (0.0020, 0.0036) [0.0023]	0.0041 (0.0025, 0.0057) [0.0013]	0.0051 (0.0044, 0.0058) [0.0005]	0.0059 (0.0050, 0.0069) [0.0011]
σ_s	0.0050	0.0049 (0.0041, 0.0066) [0.0007]	0.0051 (0.0042, 0.0059) [0.0006]	0.0051 (0.0041, 0.0064) [0.0007]	0.0047 (0.0035, 0.0060) [0.0008]	0.0050 (0.0042, 0.0063) [0.0007]	0.0045 (0.0036, 0.0056) [0.0007]
σ_i	0.0020	0.0016 (0.0012, 0.0019) [0.0005]	0.0013 (0.0012, 0.0014) [0.0007]	0.0016 (0.0012, 0.0018) [0.0005]	0.0015 (0.0013, 0.0018) [0.0005]	0.0020 (0.0018, 0.0023) [0.0002]	0.0020 (0.0019, 0.0024) [0.0002]
ϕ_π	2.0	2.075 (1.890, 2.219) [0.144]	2.038 (1.925, 2.127) [0.082]	2.071 (1.901, 2.227) [0.129]	1.753 (1.574, 1.920) [0.278]	2.024 (1.844, 2.177) [0.116]	1.948 (1.778, 2.140) [0.126]
ϕ_y	0.5	0.396 (0.281, 0.583) [0.131]	0.442 (0.353, 0.481) [0.085]	0.401 (0.271, 0.583) [0.133]	0.373 (0.225, 0.554) [0.147]	0.325 (0.175, 0.473) [0.204]	0.437 (0.279, 0.611) [0.124]
Σ		[1.959]	[1.959]	[1.935]	[2.247]	[1.527]	[1.907]
N		31	4	50	50	50	50

Table 6: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.

Ptr	Truth	Global-PF-ME 2%		Global-PF-ME 5%		Global-PF-ME 10%	
		0Q	30Q	0Q	30Q	0Q	30Q
φ_p	100	151.8 (128.4, 165.6) [50.6]	190.8 (167.7, 207.0) [90.7]	152.7 (134.1, 165.8) [52.0]	187.5 (174.6, 202.6) [88.9]	149.0 (133.1, 160.3) [49.1]	188.0 (181.9, 194.1) [88.1]
h	0.8	0.653 (0.616, 0.685) [0.148]	0.666 (0.642, 0.709) [0.134]	0.662 (0.620, 0.695) [0.141]	0.677 (0.644, 0.716) [0.126]	0.661 (0.615, 0.688) [0.143]	0.694 (0.679, 0.708) [0.107]
ρ_s	0.8	0.755 (0.709, 0.801) [0.053]	0.800 (0.773, 0.843) [0.020]	0.758 (0.717, 0.797) [0.050]	0.808 (0.782, 0.844) [0.022]	0.760 (0.717, 0.791) [0.049]	0.801 (0.787, 0.823) [0.014]
ρ_i	0.8	0.766 (0.728, 0.807) [0.038]	0.788 (0.742, 0.829) [0.029]	0.783 (0.752, 0.823) [0.026]	0.804 (0.754, 0.839) [0.025]	0.806 (0.769, 0.838) [0.022]	0.779 (0.754, 0.802) [0.028]
σ_g	0.0050	0.0038 (0.0031, 0.0044) [0.0013]	0.0039 (0.0034, 0.0052) [0.0011]	0.0032 (0.0023, 0.0039) [0.0018]	0.0040 (0.0030, 0.0052) [0.0012]	0.0027 (0.0018, 0.0036) [0.0024]	0.0045 (0.0030, 0.0052) [0.0011]
σ_s	0.0050	0.0051 (0.0038, 0.0065) [0.0008]	0.0052 (0.0042, 0.0068) [0.0007]	0.0051 (0.0040, 0.0066) [0.0007]	0.0051 (0.0039, 0.0062) [0.0007]	0.0049 (0.0041, 0.0066) [0.0007]	0.0051 (0.0042, 0.0059) [0.0006]
σ_i	0.0020	0.0019 (0.0016, 0.0021) [0.0002]	0.0017 (0.0016, 0.0021) [0.0003]	0.0017 (0.0014, 0.0020) [0.0003]	0.0015 (0.0013, 0.0019) [0.0005]	0.0016 (0.0012, 0.0019) [0.0005]	0.0013 (0.0012, 0.0014) [0.0007]
ϕ_π	2.0	2.023 (1.820, 2.174) [0.133]	2.138 (1.997, 2.310) [0.181]	2.048 (1.865, 2.191) [0.128]	2.119 (1.939, 2.306) [0.175]	2.075 (1.890, 2.219) [0.144]	2.038 (1.925, 2.127) [0.082]
ϕ_y	0.5	0.319 (0.183, 0.439) [0.202]	0.376 (0.227, 0.697) [0.176]	0.332 (0.213, 0.544) [0.180]	0.403 (0.279, 0.621) [0.142]	0.396 (0.281, 0.583) [0.131]	0.442 (0.353, 0.481) [0.085]
Σ		[1.798]	[2.075]	[1.897]	[2.087]	[1.959]	[1.959]
N		38	19	50	50	31	4

Table 7: Median, $(5\%, 95\%)$ credible sets and $[RMSE]$ of the mean posterior estimated parameters for N datasets. Σ is the sum of the normalized RMSE.