

Supplementary Materials for

Nocturnal Boundary Layer Height Uncertainty in Particulate Matter Simulations during the KORUS-AQ Campaign

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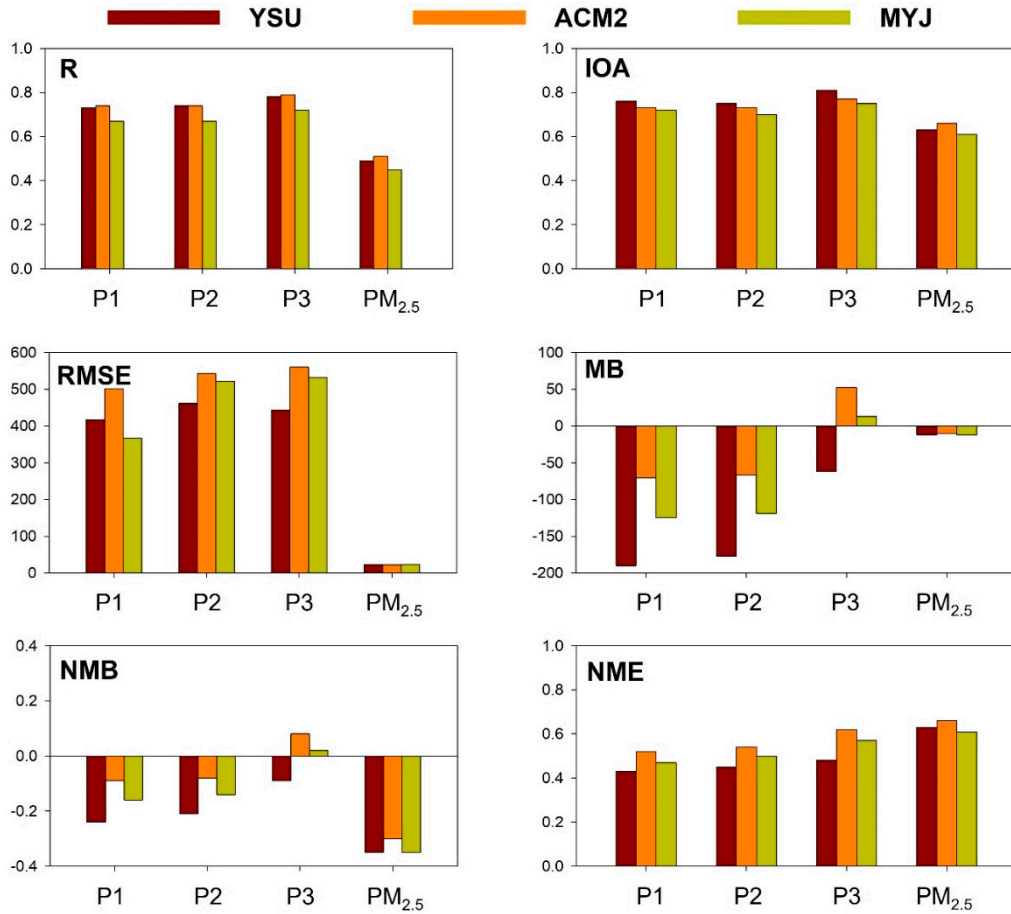
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Figure S1

Figure S2

Table S1

Figure S1. Comparisons of WRF-Chem simulation performance against observed PBLH at Gwanak (P1), Gwangjin (P2), and Jungnang (P3) and measured PM_{2.5} at Seoul-Bulgwang.



Here, Correlation Coefficient (R) ($=[\sum(M_i - \bar{M})(O_i - \bar{O})]/[\sum[(M_i - \bar{M})^2 \sum(O_i - \bar{O})^2]^{1/2}]$), Normalized Mean Error(NME) ($=\sum |M_i - O_i|/\sum O_i$), Root Mean Square Error (RMSE) ($=[\sum(M_i - O_i)^2/N]^{1/2}$), and Index of Agreement (IOA)($=1 - \sum(M_i' - O_i')^2/\sum(|M_i'| - |O_i'|)^2$) were used. Where N is the number of pairs of observations/simulations, M_i is the simulations, O_i is the observations, and \bar{M} and \bar{O} represent the simulated and observed means, and M' and O' represent $M_i - \bar{M}$ and $O_i - \bar{O}$ respectively.

Figure S2. Comparison between PBLH observations at P1 (Gwanak), P2 (Gwangjin) and P3 (Jungnang).

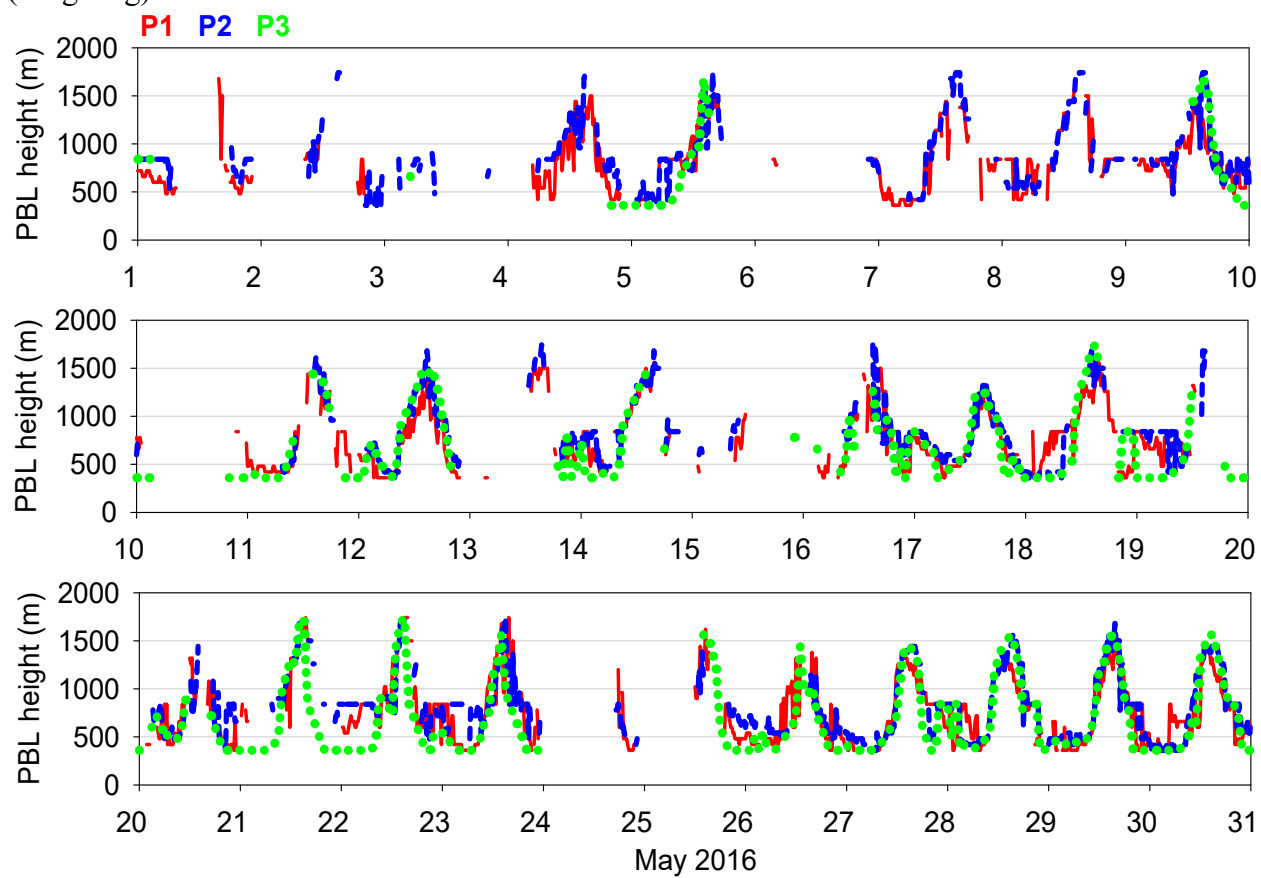


Table S1. Summary statistics for comparison between WRF-Chem simulations and observed PBLH at Gwanak (P1), Gwangjin (P2), and Jungnang (P3) and measured PM_{2.5} at Seoul-Bulgwang.

Species	Statistical Parameters	Model (YSU)	Model (ACM2)	Model (MYJ)
PBLH at Gwanak (meter)	Mean	592.09	711.68	657.59
	R	0.73	0.74	0.67
	IOA	0.76	0.73	0.72
	RMSE	417.32	501.72	366.95
	MB	-189.97	-70.38	-124.48
	NMB	-0.24	-0.09	-0.16
	NME	0.43	0.52	0.47
PBLH at Gwangjin (m)	Mean	660.94	770.74	718.80
	R	0.74	0.74	0.67
	IOA	0.75	0.73	0.70
	RMSE	461.60	543.04	522.41
	MB	-176.81	-67.01	-118.95
	NMB	-0.21	-0.08	-0.14
	NME	0.45	0.54	0.50
PBLH at Jungnang (m)	Mean	621.23	735.65	696.28
	R	0.78	0.79	0.72
	IOA	0.81	0.77	0.75
	RMSE	443.54	560.08	531.86
	MB	-62.06	52.37	12.99
	NMB	-0.09	0.08	0.02
	NME	0.48	0.62	0.57
PM_{2.5} at Bulgwang (μg m⁻³)	Mean	21.90	23.43	21.78
	R	0.49	0.51	0.45
	IOA	0.63	0.66	0.61
	RMSE	23.25	22.05	23.60
	MB	-11.80	-10.26	-11.91
	NMB	-0.35	-0.30	-0.35
	NME	0.63	0.66	0.61

Here, Correlation Coefficient (R) ($=[\sum(M_i - \bar{M})(O_i - \bar{O})]/[\sum[(M_i - \bar{M})^2 \sum(O_i - \bar{O})^2]^{1/2}]$), Normalized Mean Error(NME) ($=\sum |M_i - O_i|/\sum O_i$), Root Mean Square Error (RMSE) ($=[\sum(M_i - O_i)^2/N]^{1/2}$), and Index of Agreement (IOA)($=1 - \sum(M_i' - O_i')^2/\sum(|M_i'| - |O_i'|)^2$) were used. Where N is the number of pairs of observations/simulations, M_i is the simulations, O_i is the observations, and \bar{M} and \bar{O} represent the simulated and observed means, and M' and O' represent $M_i - \bar{M}$ and $O_i - \bar{O}$ respectively.