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Supplement of

Deep-learning spatial principles from deterministic chemical transport models for chemical reanalysis: an application in China for $PM_{2.5}$

Baolei Lyu et al.

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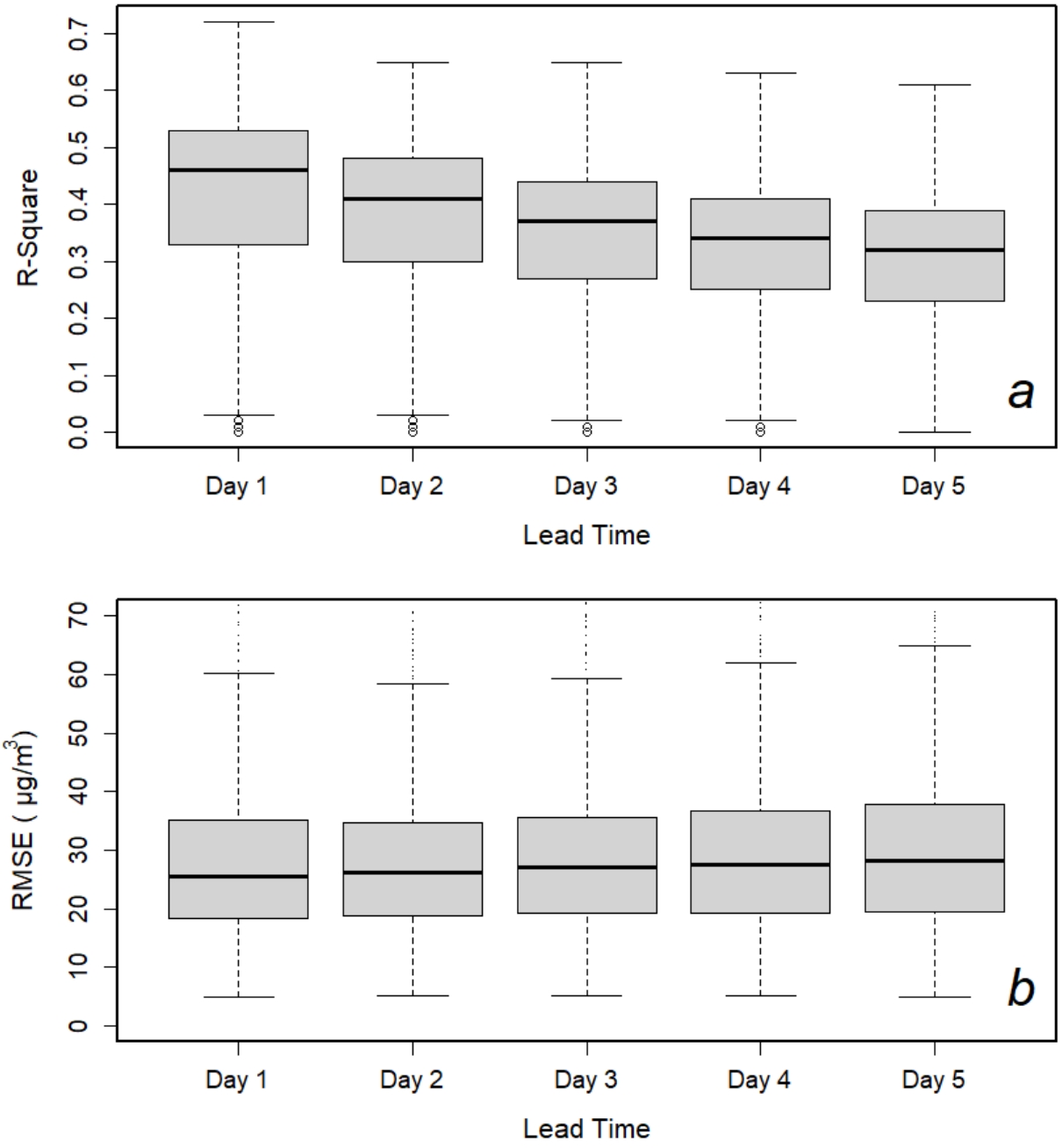


Figure S1 The performance measures as R^2 and RMSE of CTM simulations of $PM_{2.5}$ concentration against station measurements at different forecasting lead time in 2019.

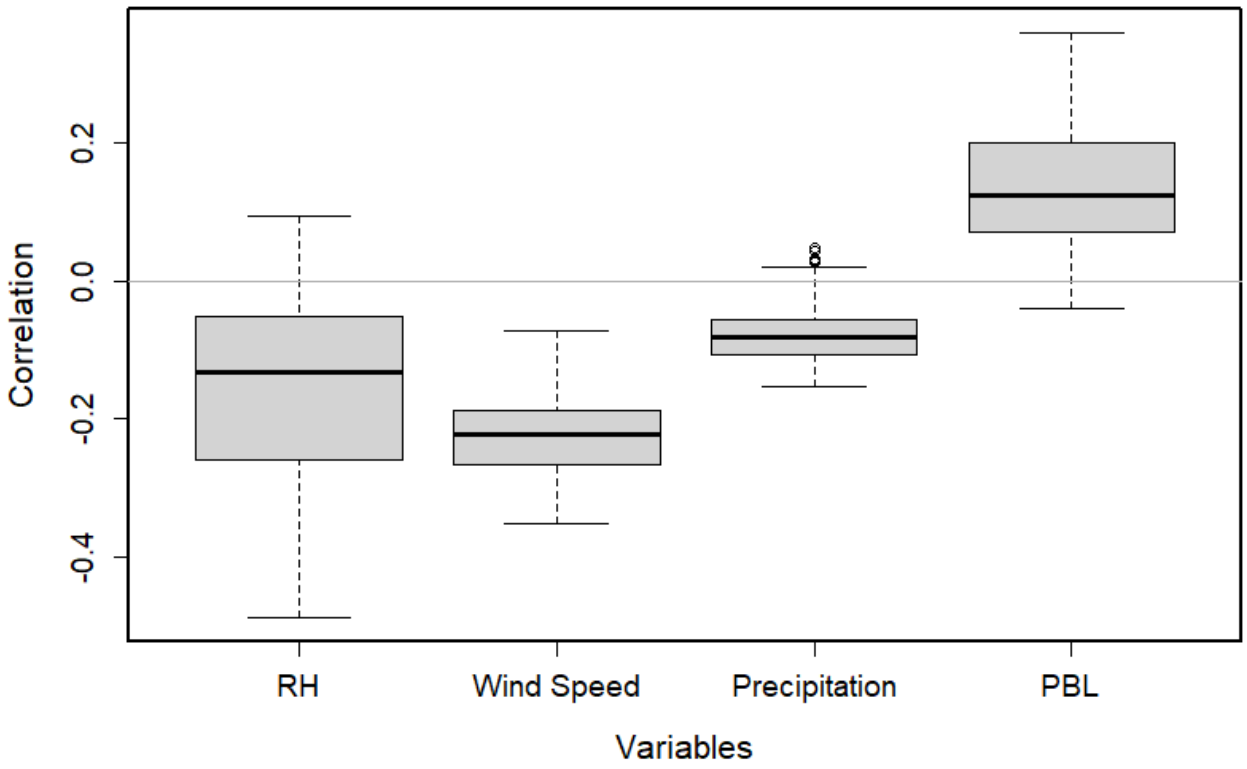


Figure S2 Boxplots of correlation coefficients between $PM_{2.5}$ concentrations and four select meteorological variables, all simulated by CTM.

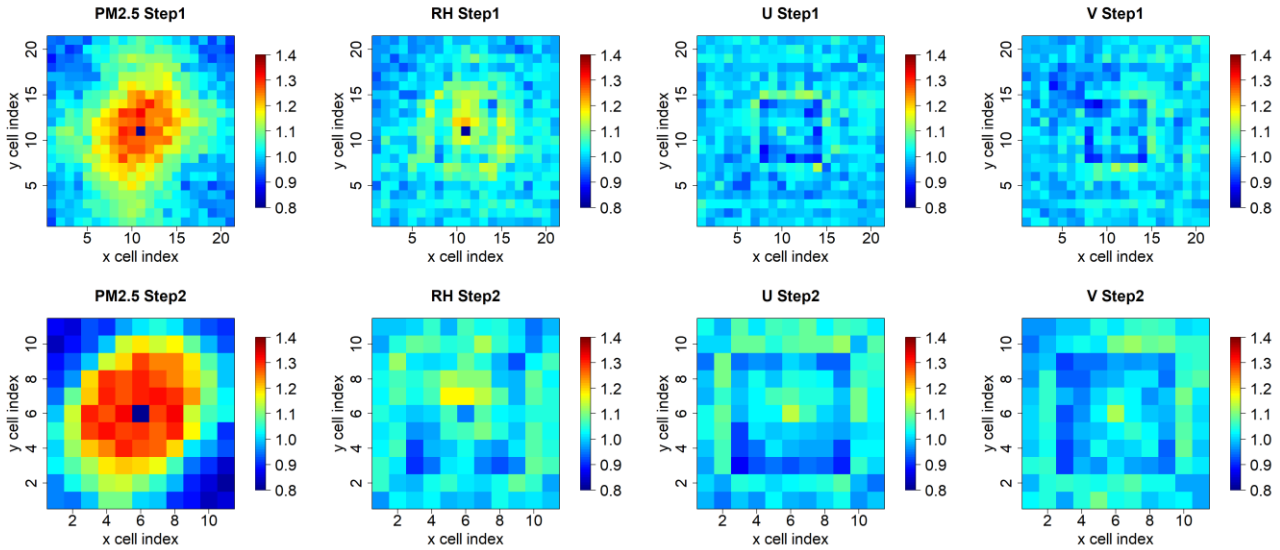
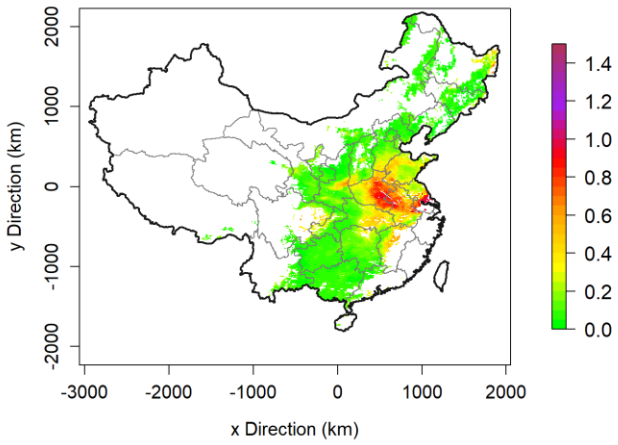
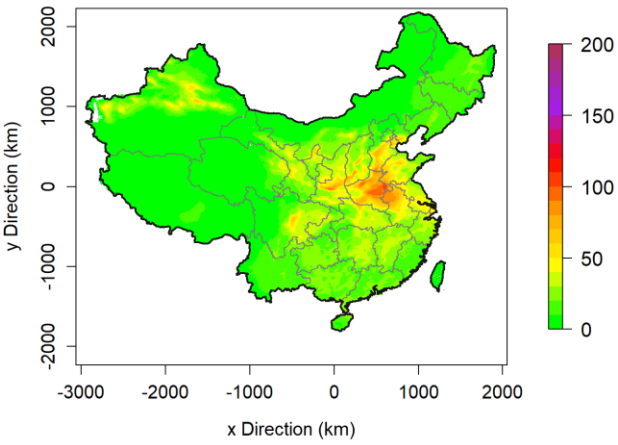


Figure S3 PointConv kernels for $PM_{2.5}$, RH, wind u-component and v-component.

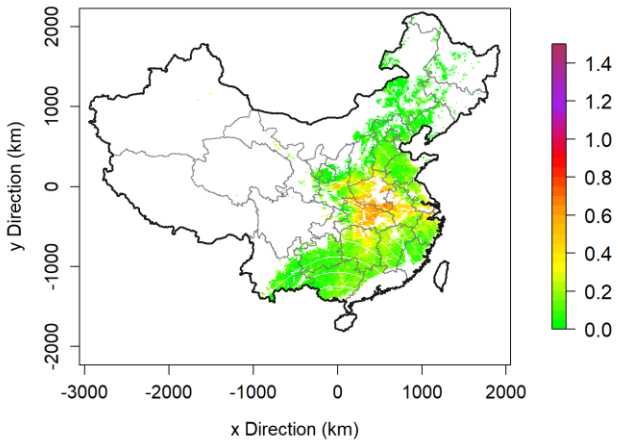
AOD 20201022



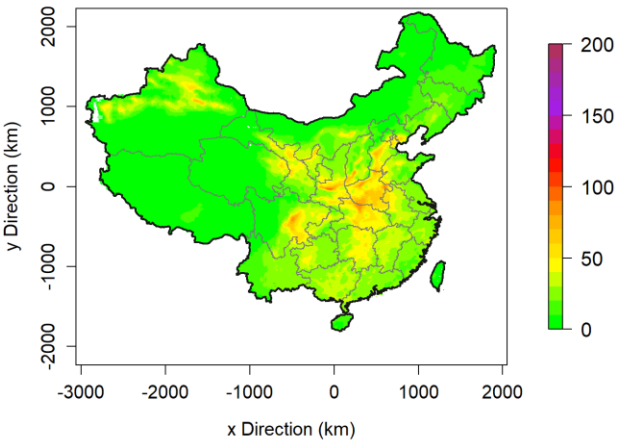
$PM_{2.5}$ 20201022



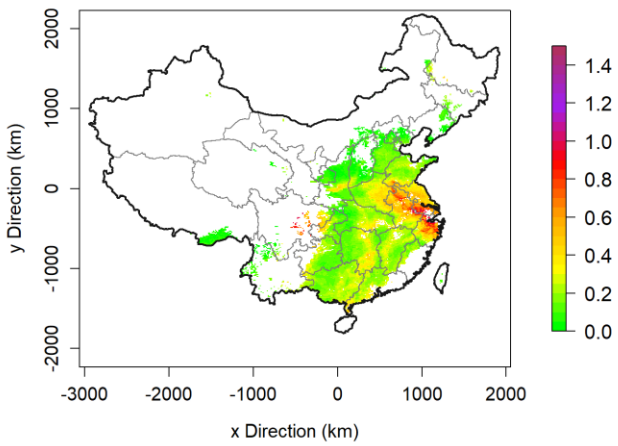
AOD 20201023



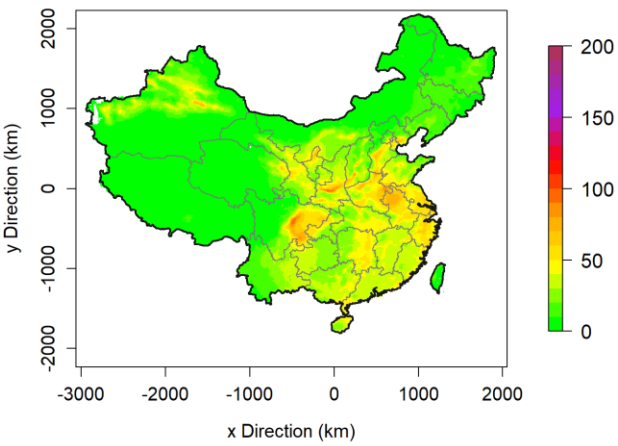
$PM_{2.5}$ 20201023



AOD 20201108



$PM_{2.5}$ 20201108



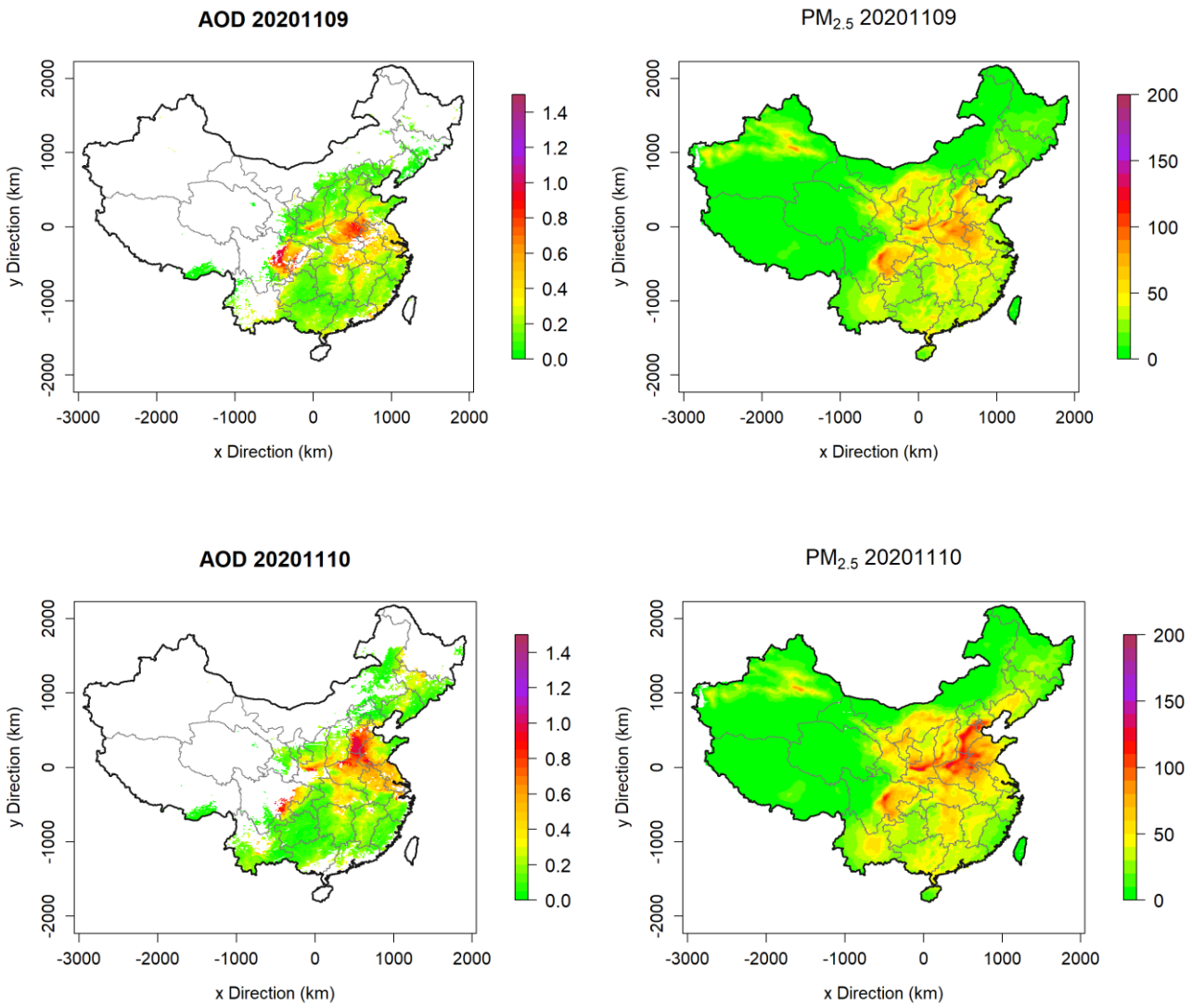


Figure S4 Comparison between fused $PM_{2.5}$ fields and MODIS AOD.

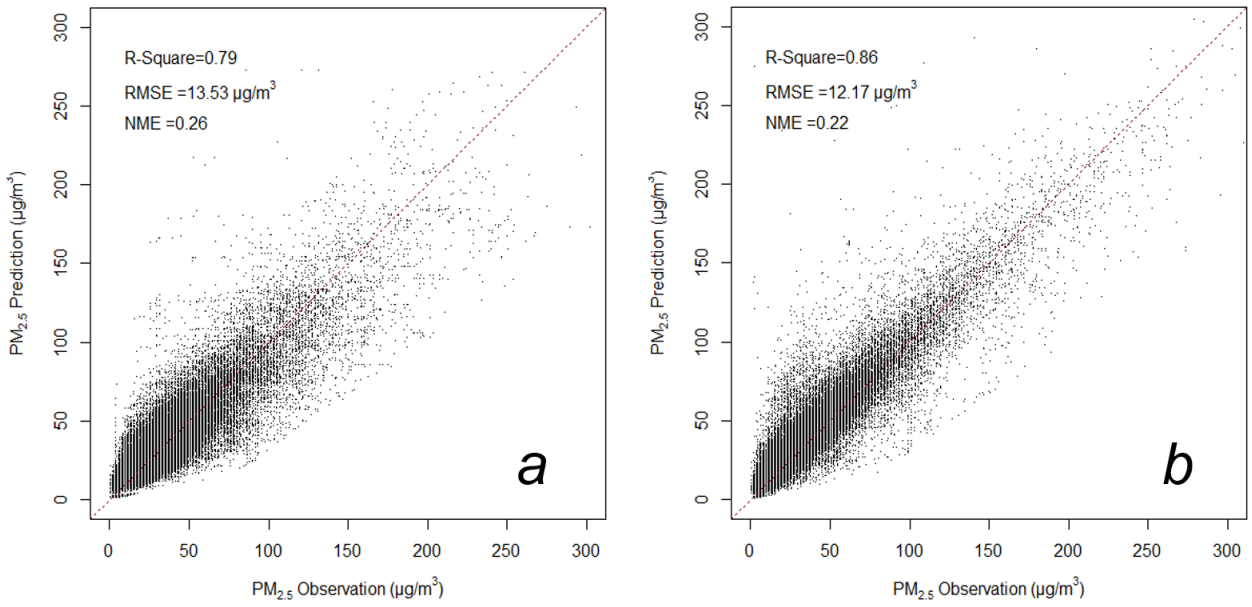


Figure S5 Performance evaluation of the fused $PM_{2.5}$ fields in 2020 using the model trained with the 5-day lead CTM simulations respectively using the LCCV (*a*) and LSCV (*b*) methods.

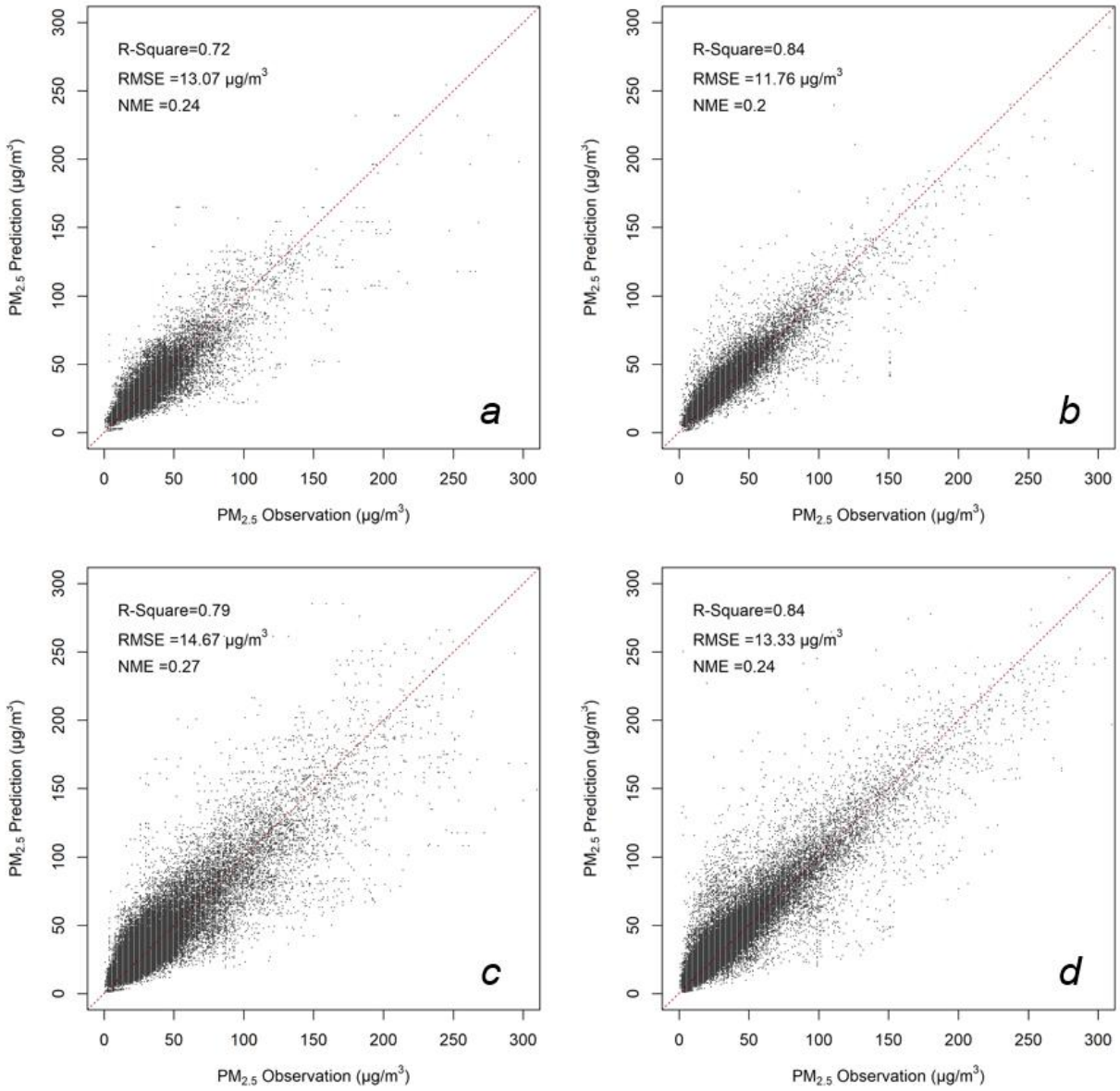


Figure S6 Performance evaluation of the fused $PM_{2.5}$ fields in the national lockdown period of February to April in 2020 (panel *a*, *b*) and in the remaining periods (*c*, *d*) respectively using the LCCV (*a*, *c*) and LSCV (*b*, *d*) methods.