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The remote sensing of radiative forcing by light-absorbing particles (LAPs) in seasonal snow over northeastern China

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Table S1. R^2 between MODIS retrieved I_{LAPs} versus fitted I_{LAPs_fit} using different datasets.

BC Wet Deposition Data	BC Dry Deposition Data	Snowfall Data	R^2 (MODIS Retrieved I_{LAPs} Versus Fitted I_{LAPs_fit})
MERRA-2	MERRA-2	ERA-Interim	0.84[b]
MERRA-2	MERRA-2	MERRA-2	0.82[b]
MERRA-2	MERRA-2	CPC	0.82[b]
CMIP6[a]	CMIP6	ERA-Interim	0.84[c]
CMIP6	CMIP6	MERRA-2	0.83[c]
CMIP6	CMIP6	CPC	0.81[c]

a: CMIP6 data in this study is CIMP6 multi-model ensemble mean data including CESM2, CESM2-WACCM, and CNRM-ESM2-1 historical experiments from 2003 to 2014. So far, only the above three models in CMIP6 provide BC deposition data.

b: data used to fit I_{LAPs_fit} is from 2003 to 2017.

c: data used to fit I_{LAPs_fit} is from 2003 to 2014, which is due to that the data of CMIP6 historical experiments is only updated to 2014.

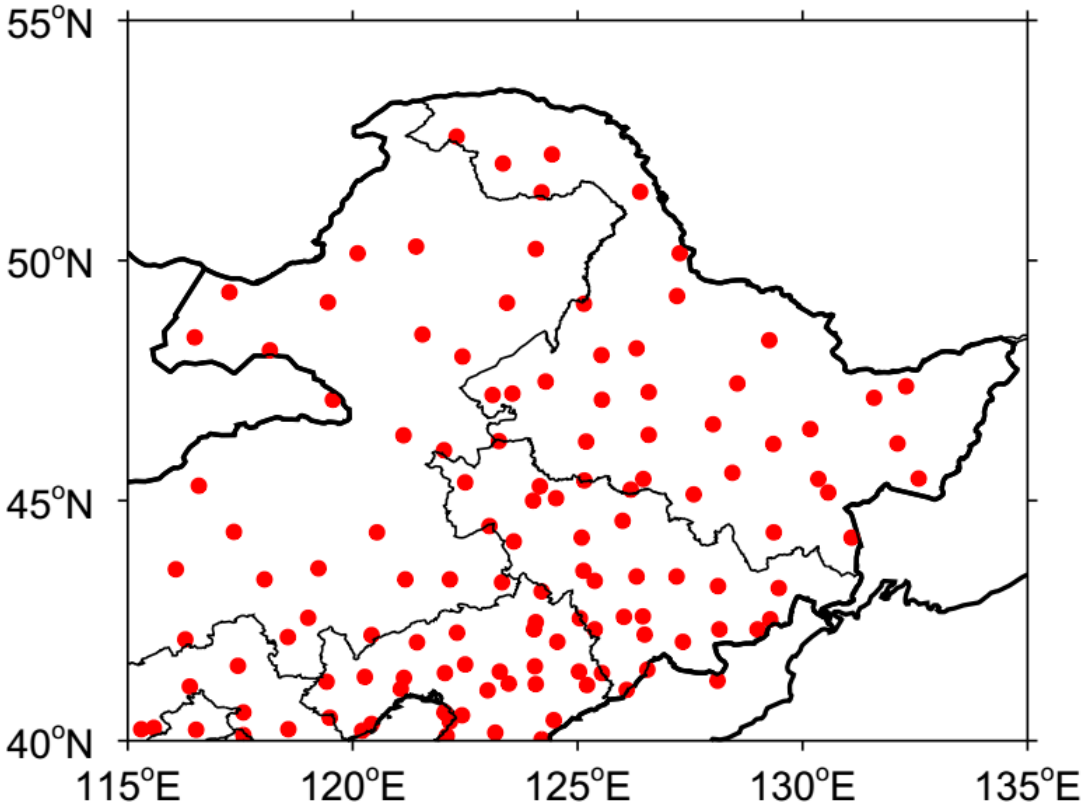

Figure S1. Spatial distribution of 126 meteorological observation stations in NEC.

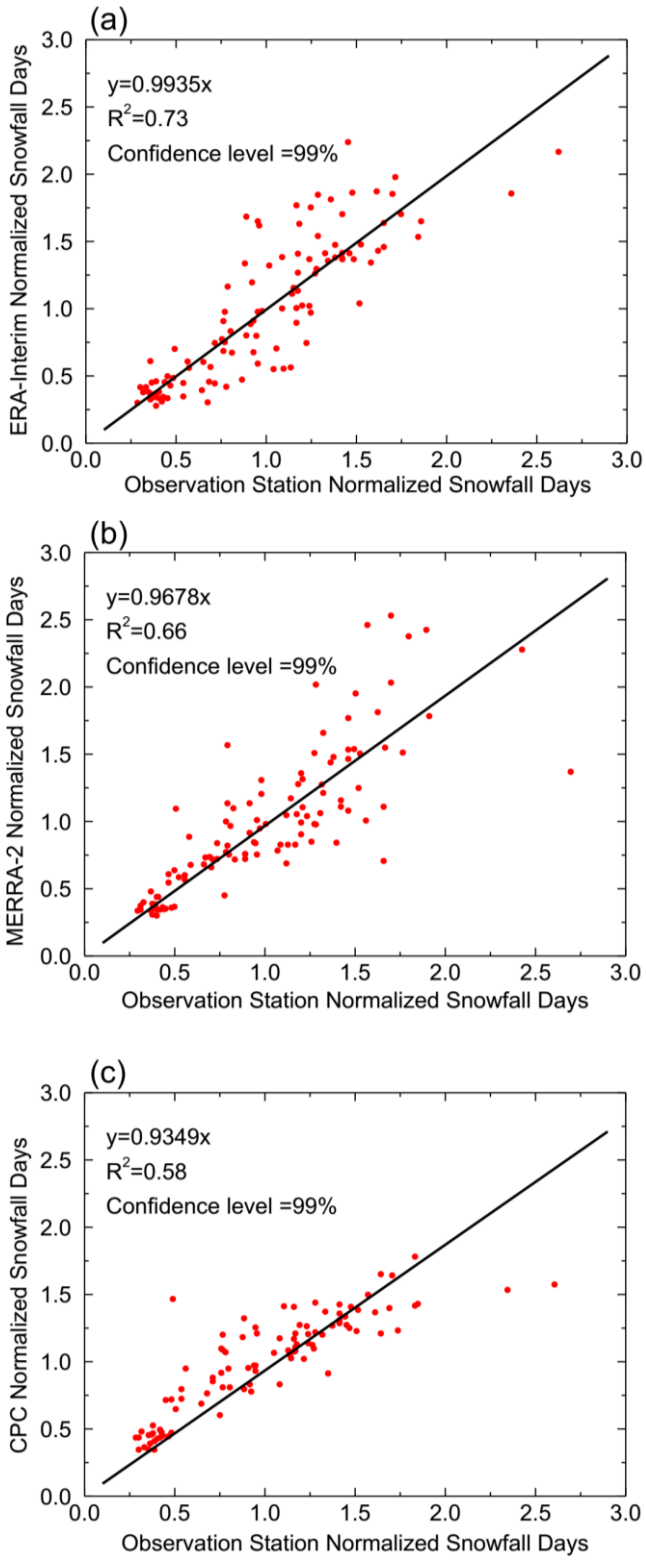

Figure S2. A comparison of 126-station normalized snowfall days versus (a) ERA-Interim, (b) MERRA-2, and (c) CPC normalized snowfall days.

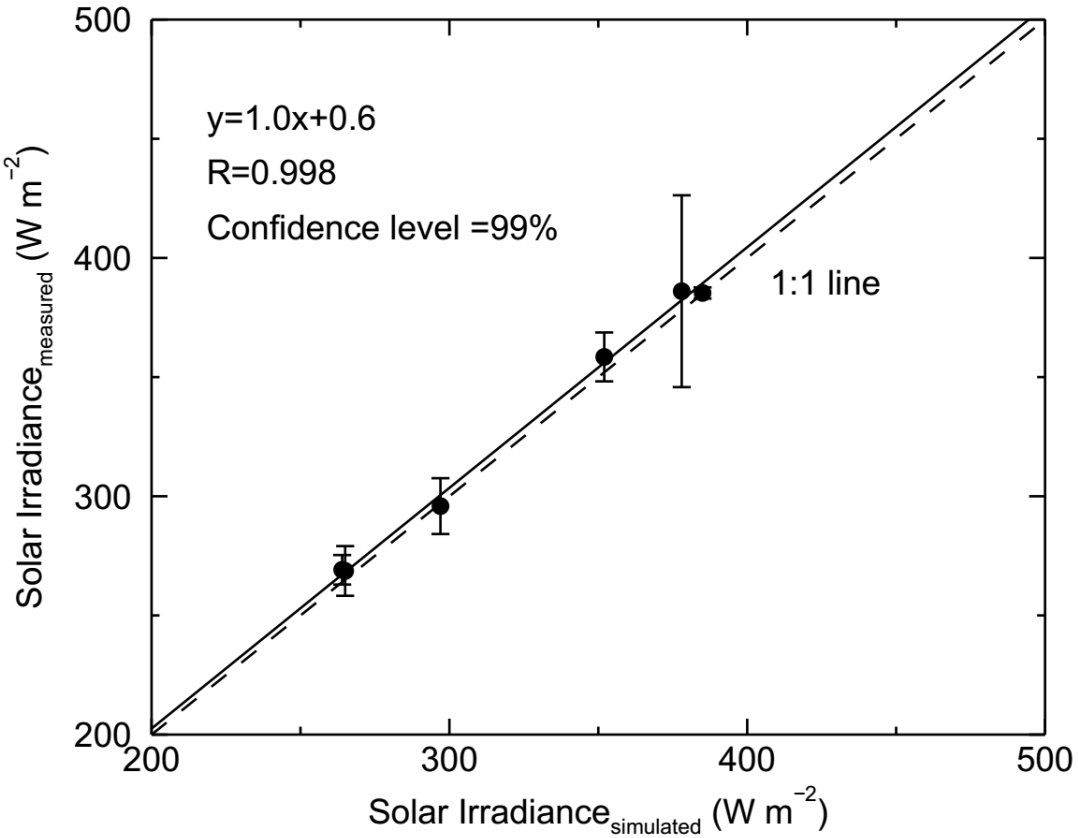

Figure S3. A comparison of the SBDART-simulated and ASD-measured solar irradiance values in January 2014.

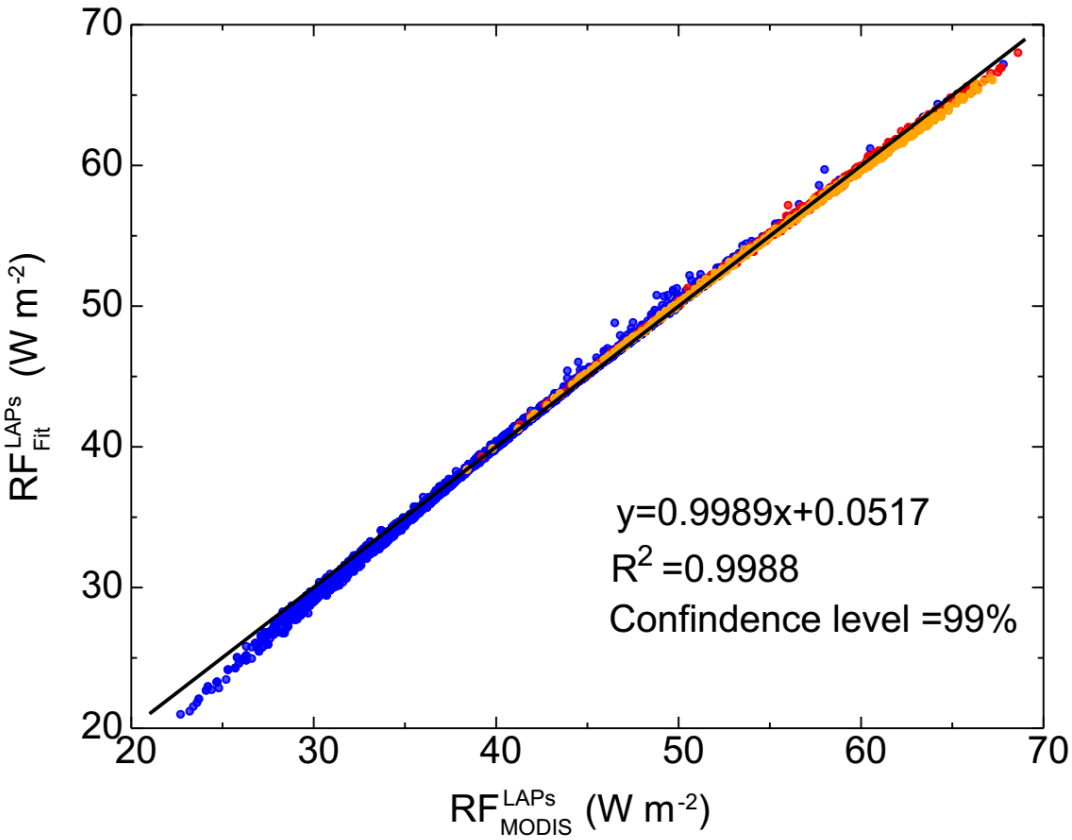

Figure S4. A comparison of RF^{LAPs}_{MODIS} and fitted radiative forcing (RF^{LAPs}_{Fit}). Different color represents different regions defined in Section 4.3.

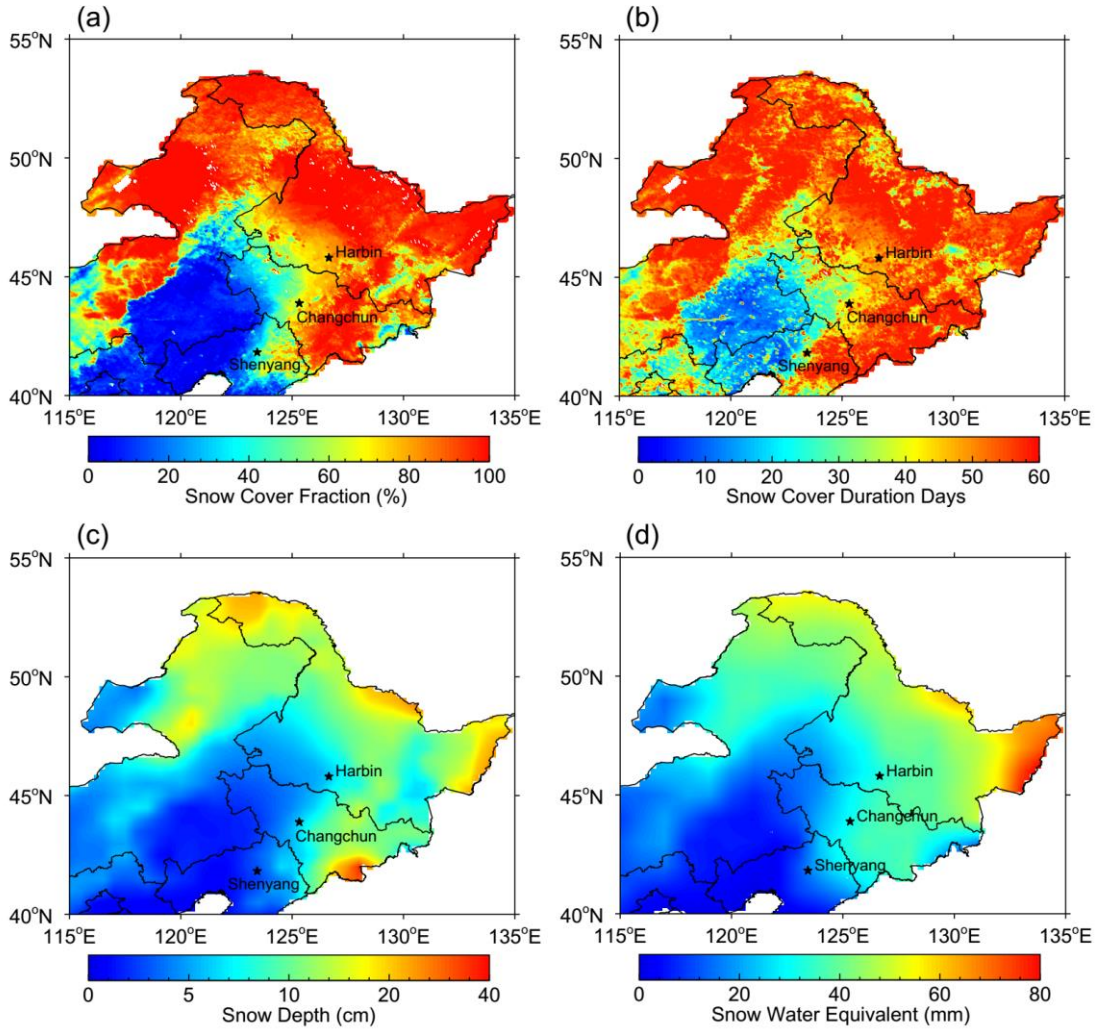

Figure S5. Spatial distribution of average (a) snow cover fraction, (b) snow cover duration days, (c) snow depth, and (d) snow water equivalent in January-February from 2003 to 2017. The data of snow cover fraction and duration days is from MODIS MYD10CM and MYD10C2, respectively. The method calculating the snow cover duration days is from Chen et al. (2015). Snow depth data is from Canadian Meteorological Centre (CMC). Snow water equivalent data is from European Space Agency (ESA) Global Snow Monitoring for Climate Research.

References

Chen, X. N., Liang, S. L., Cao, Y. F., He, T., and Wang, D. D.: Observed contrast changes in snow cover phenology in northern middle and high latitudes from 2001-2014, Sci Rep-Uk, 5, https://doi.org/10.1038/srep16820, 2015.