

Supplement of Atmos. Chem. Phys., 18, 18123–18148, 2018
<https://doi.org/10.5194/acp-18-18123-2018-supplement>
© Author(s) 2018. This work is distributed under
the Creative Commons Attribution 4.0 License.



Supplement of

Source sector and region contributions to black carbon and PM_{2.5} in the Arctic

Negin Sobhani et al.

Correspondence to: Negin Sobhani (negins@ucar.edu)

The copyright of individual parts of the supplement might differ from the CC BY 4.0 License.

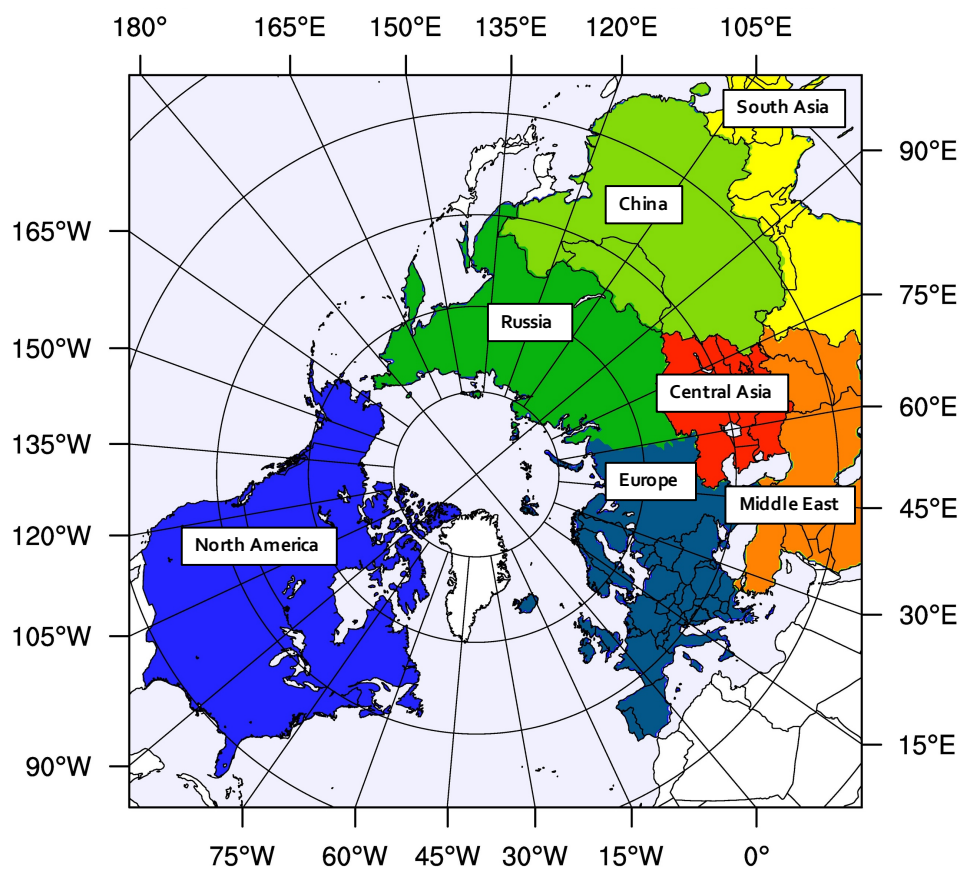
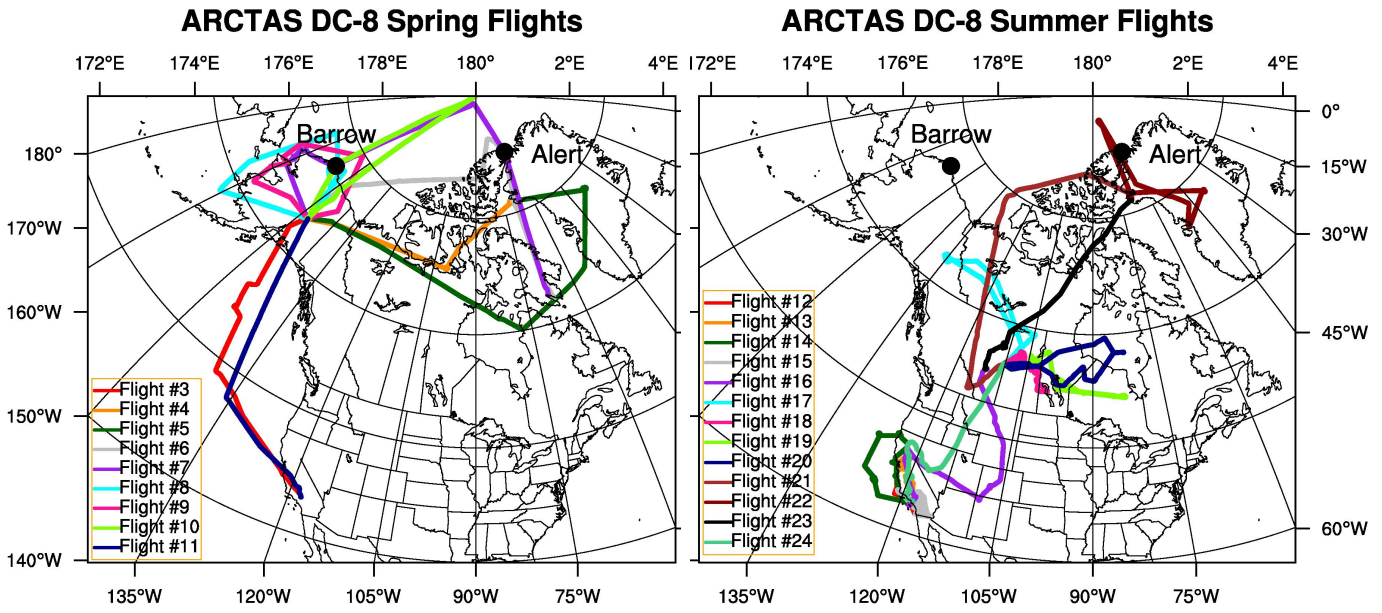


Figure S1: WRF-STEM modeling domain setup and source regions defined for this study.



5 Figure S2: NASA ARCTAS DC-8 flight tracks during a) Spring 2008 and b) Summer 2008.

NASA ARCTAS Spring and Summer Flights

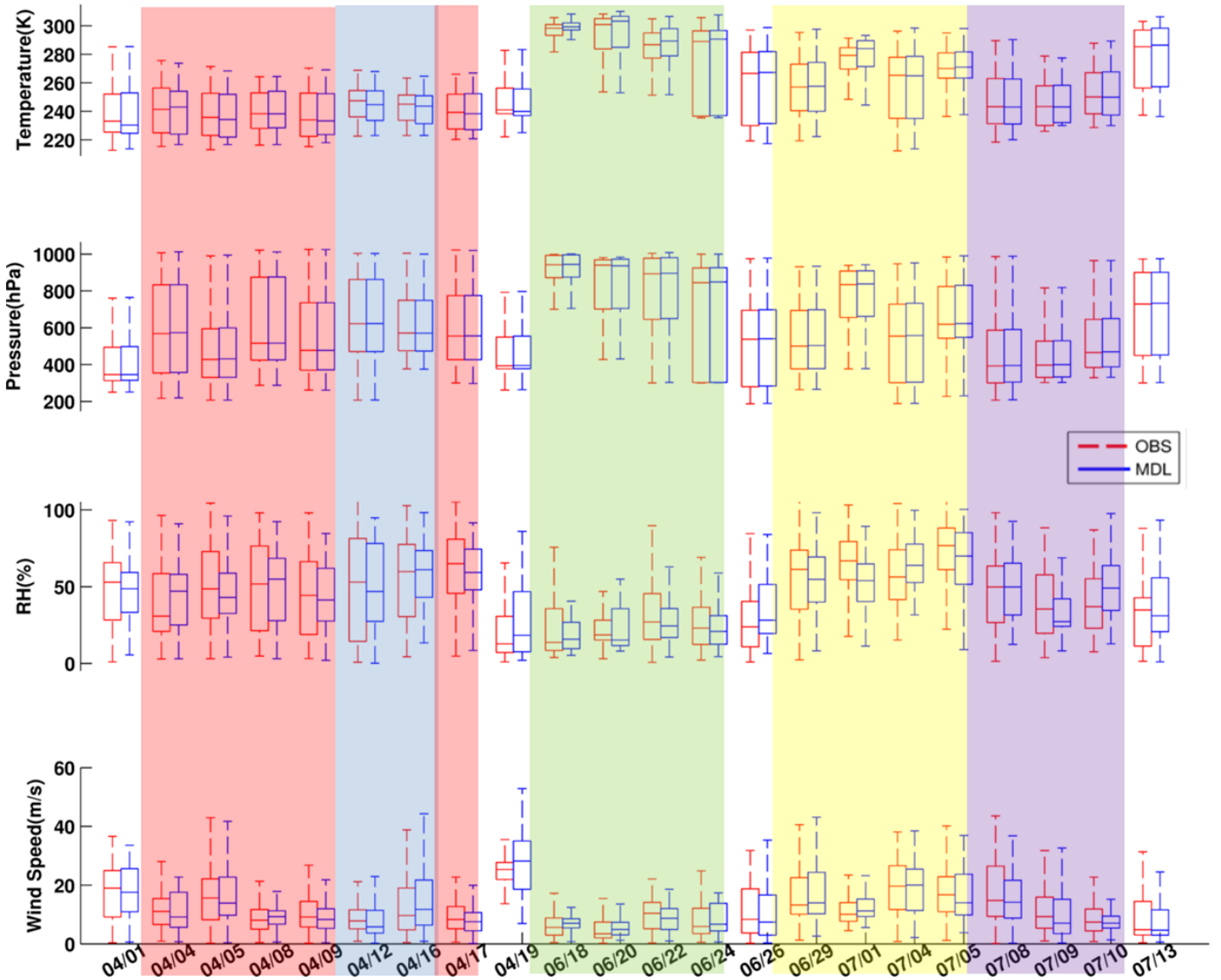


Figure S3: Comparison of key meteorological variables for NASA ARCTAS spring and summer flights. Each flight category is shaded with a different color and the spring and summer transition flights are not shaded. Spring Alaska local flights and spring Greenland flights are shaded blue and red respectively. Green, yellow, and purple shades denote the summer California flights, summer Canada flights, and summer Canada Greenland flights. In each box whisker panel, the middle line denotes the median value, while the edges of the box represent 25th and 75th percentile values respectively. The whiskers denote the maximum and minimum values. Error! Reference source not found. shows the NASA ARCTAS flight categories and Figure SM2 panels show the flight tracks for spring and summer.

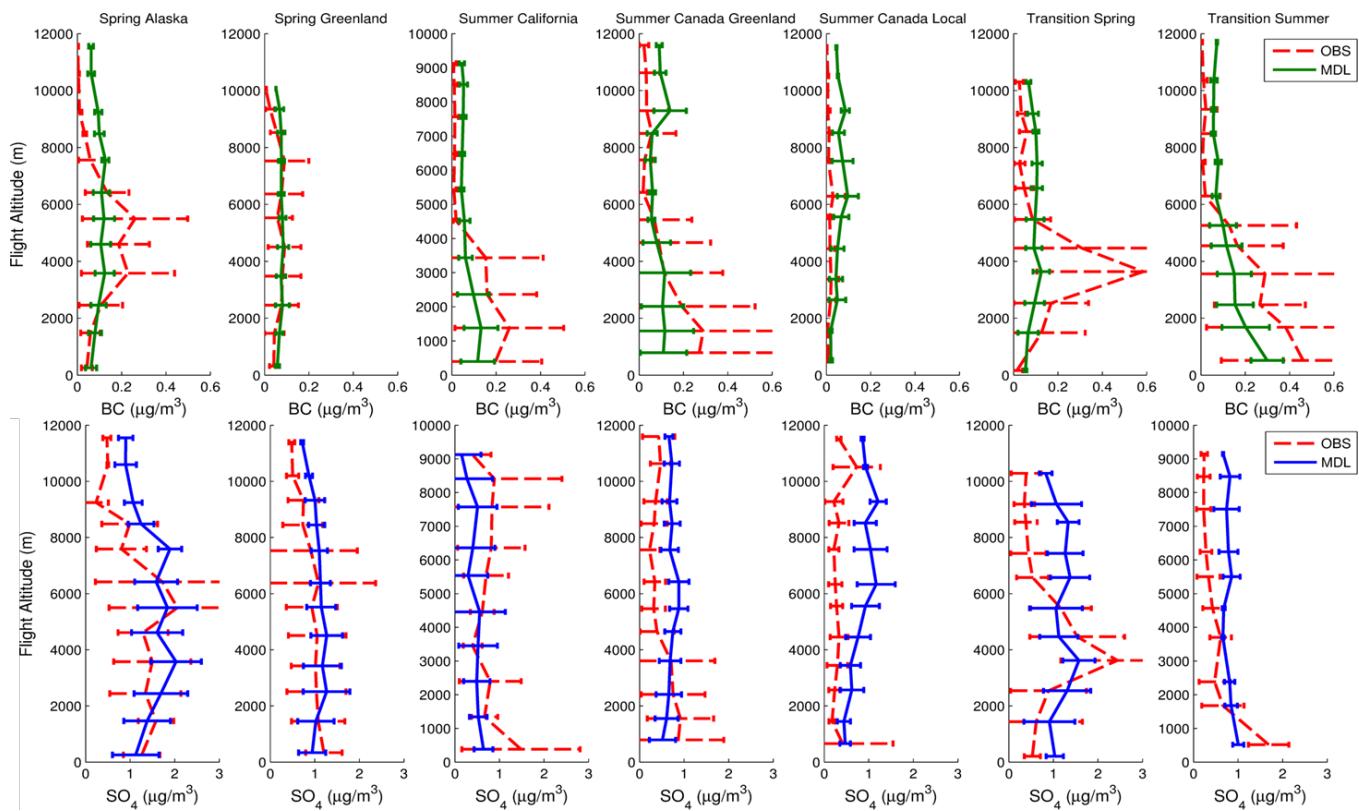


Figure S4: Vertical profile and comparison of STEM model aerosols with ARCTAS DC8 aircraft observations.

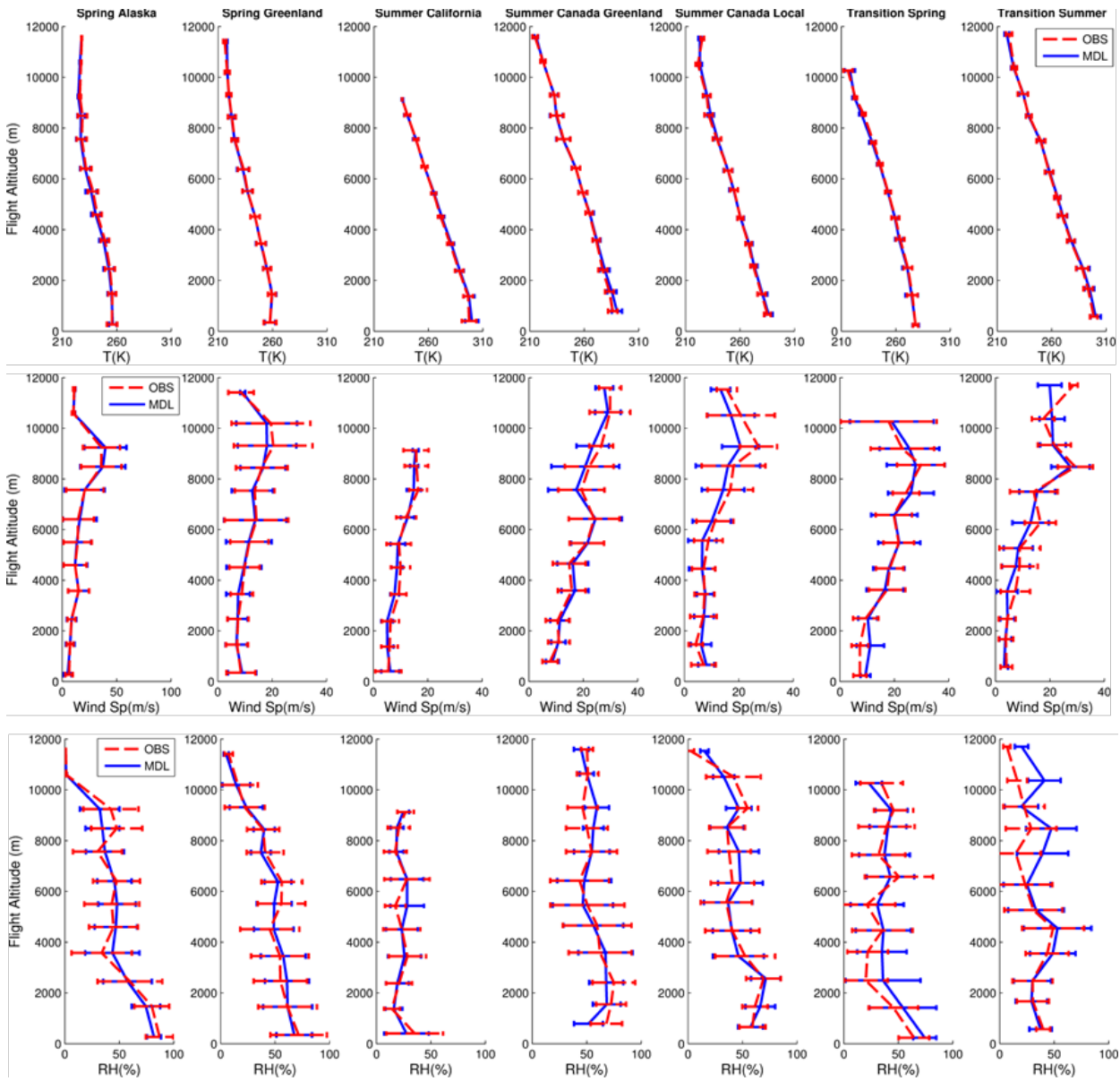


Figure S5: Vertical profile and comparison of simulated vs measured metrological variables for ARCTAS flight categories.

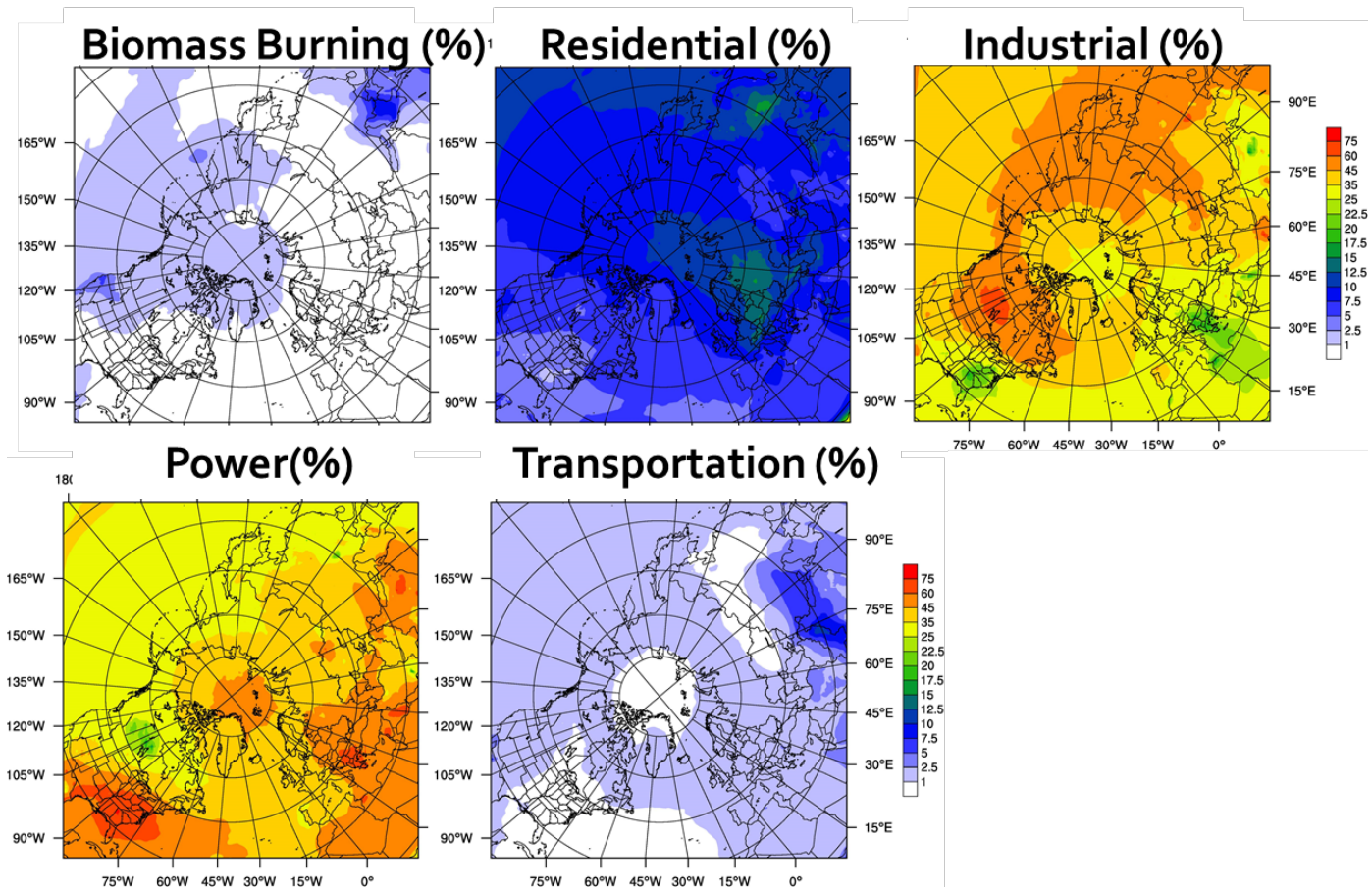


Figure S6: Spatial distribution of source sector contributions (%) to annual sulfate (SO₄) surface concentration

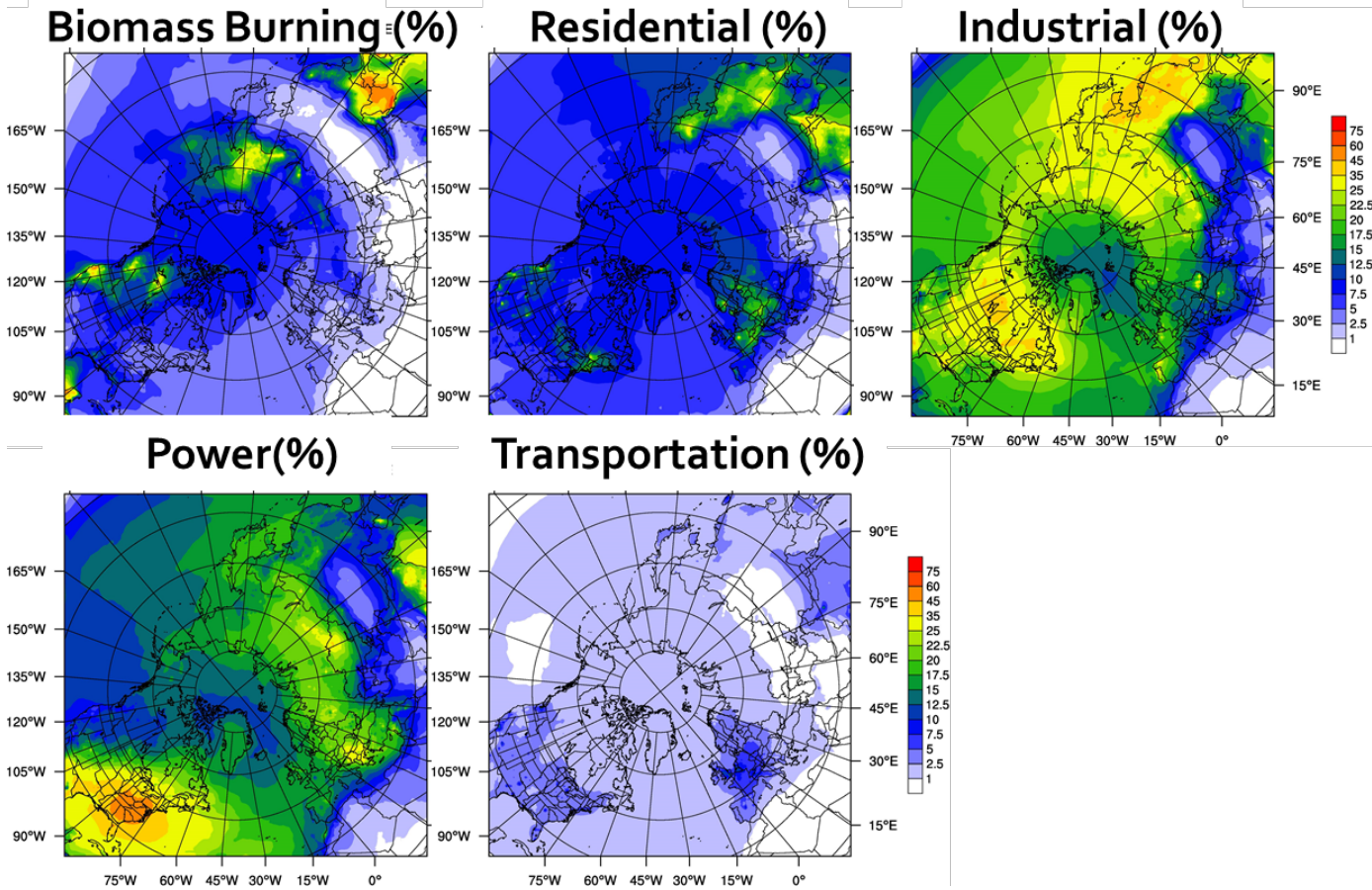


Figure S7: Spatial distribution of source sector contributions (%) to annual PM_{2.5} surface concentration

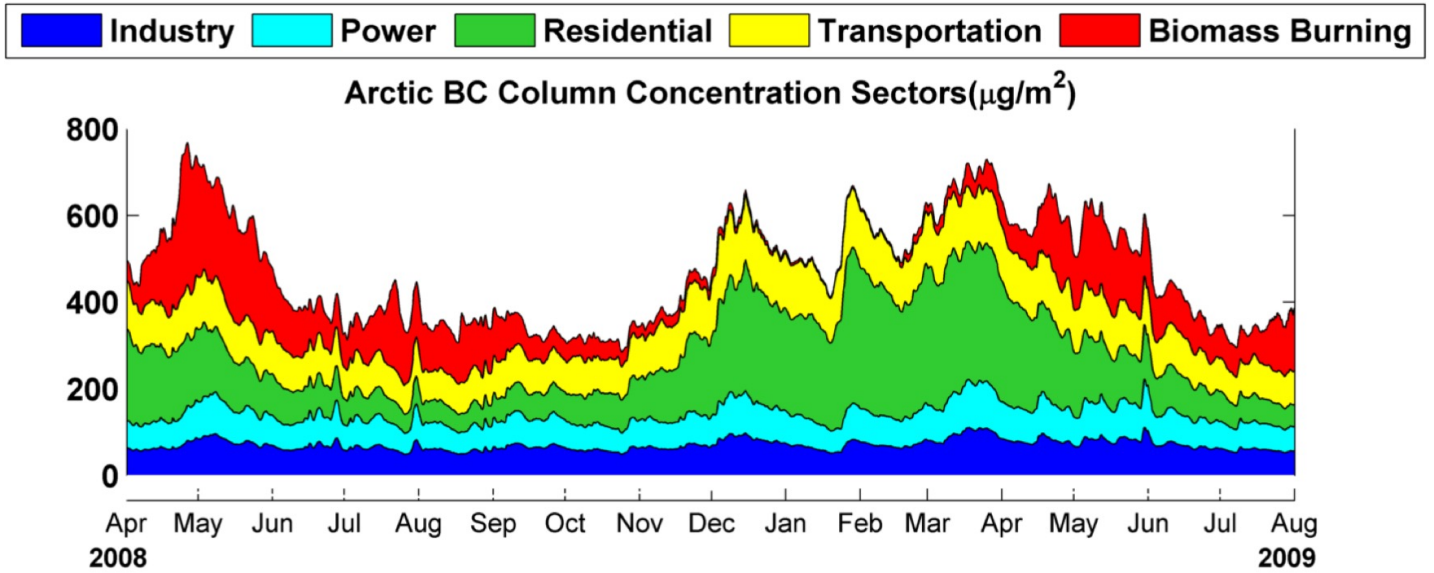


Figure S8: Time-series concentration and contribution of different economic sectors to BC column concentrations over the Arctic.

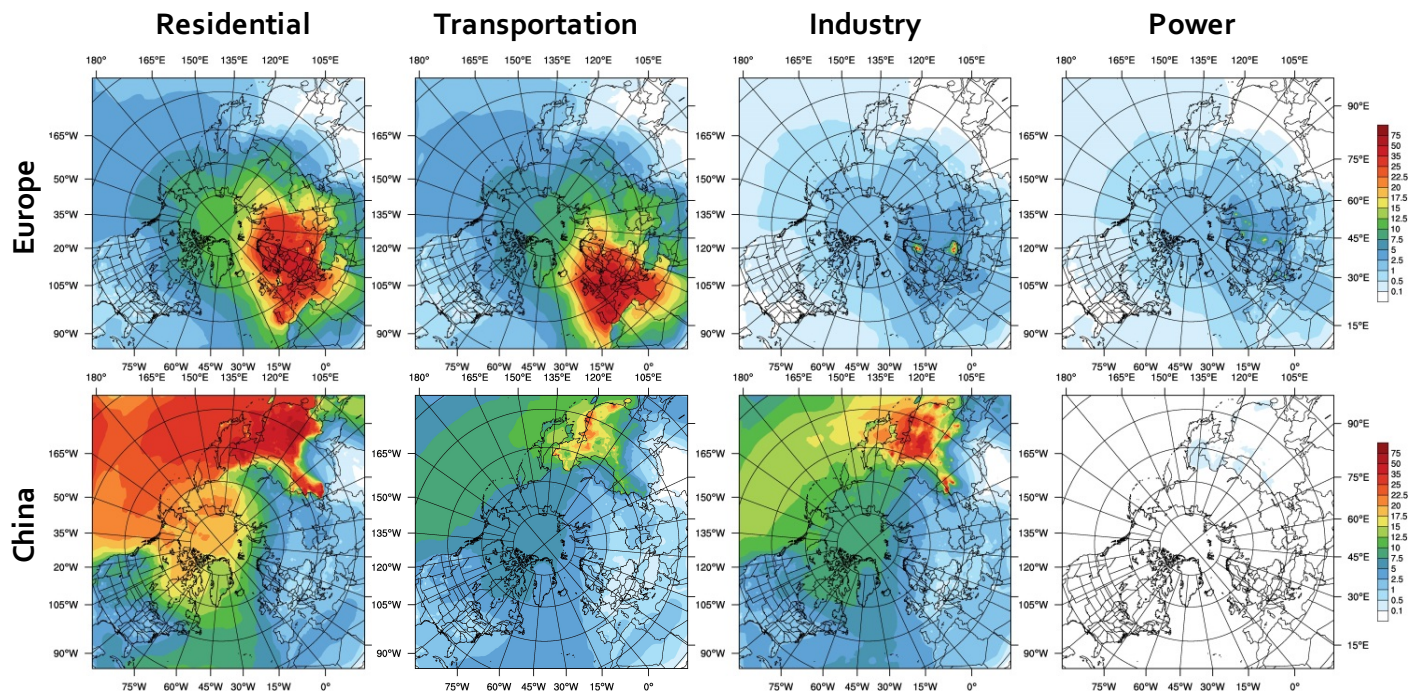


Figure S9: % contributions of different sectors from Europe and China to surface BC— annual average

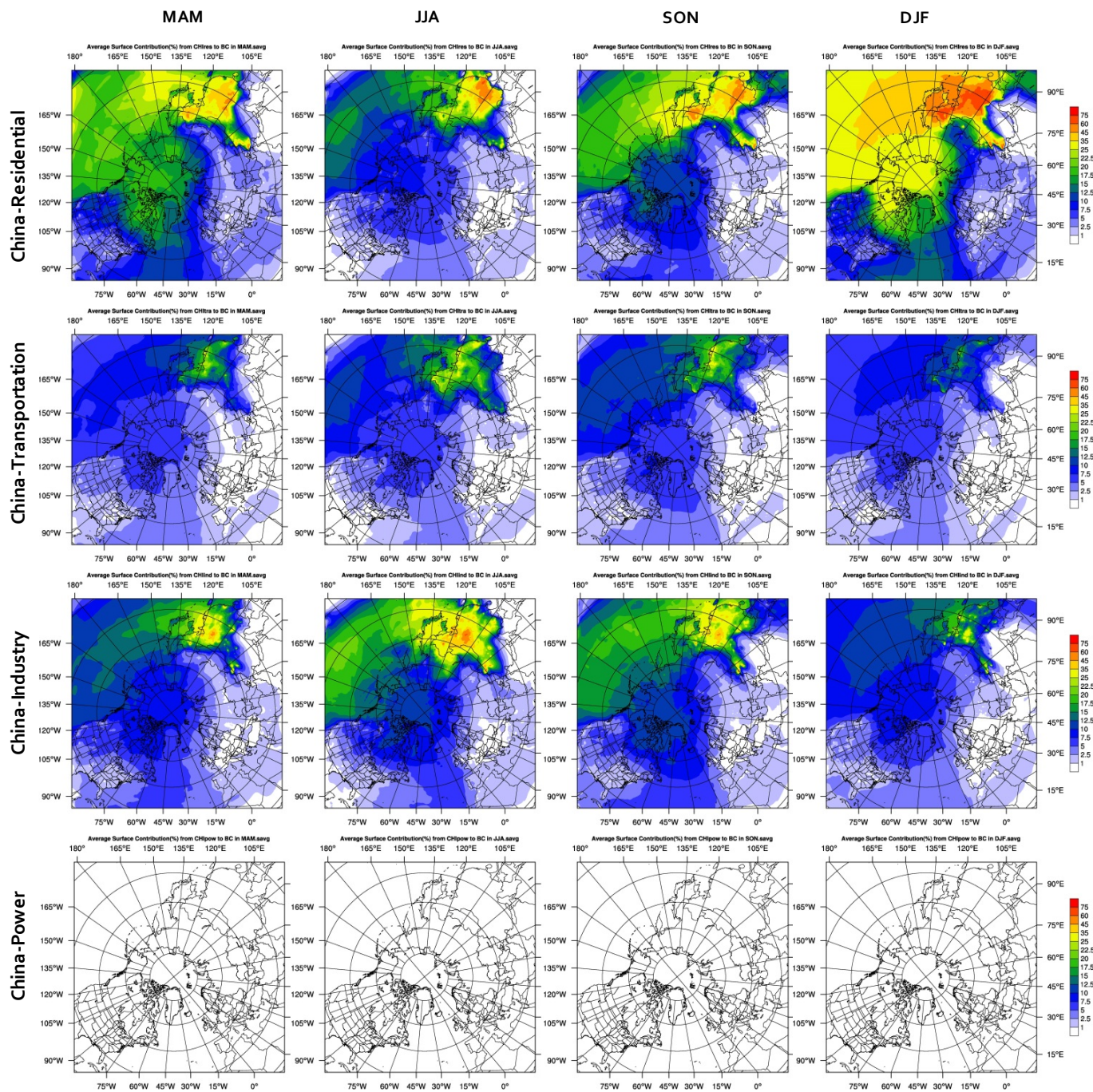


Figure S10: Seasonality % contributions of different economic sectors from China to surface BC.

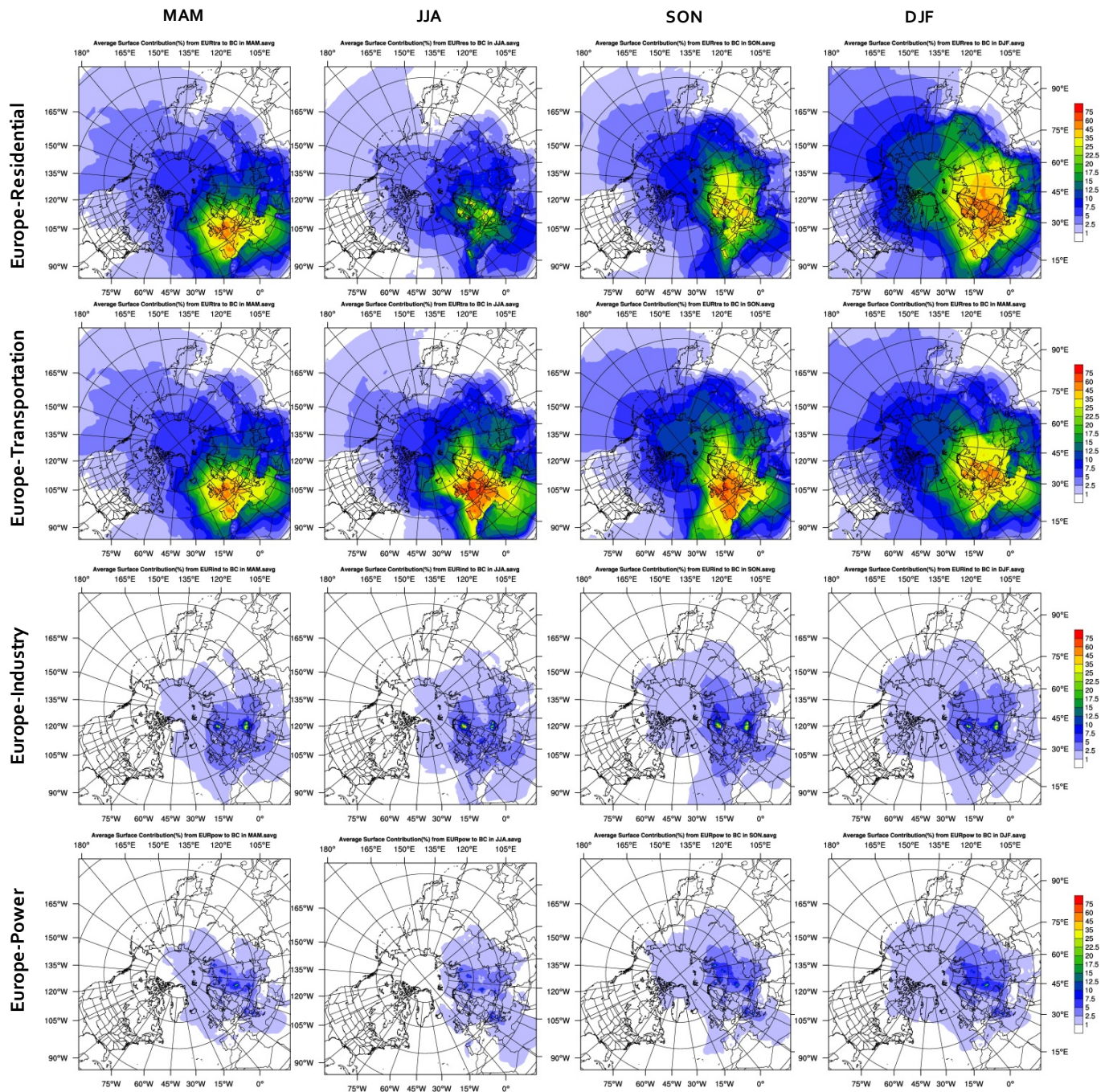


Figure S11: Seasonality % contributions of different economic sectors from Europe to surface BC. MAM denotes the average for months of March, April, and May. JJA denotes the average for months of June, July, and August. SON (bottom right panel) denotes average for months of September, October, and November. DJF denotes the average for the months of December, January, and February.

5

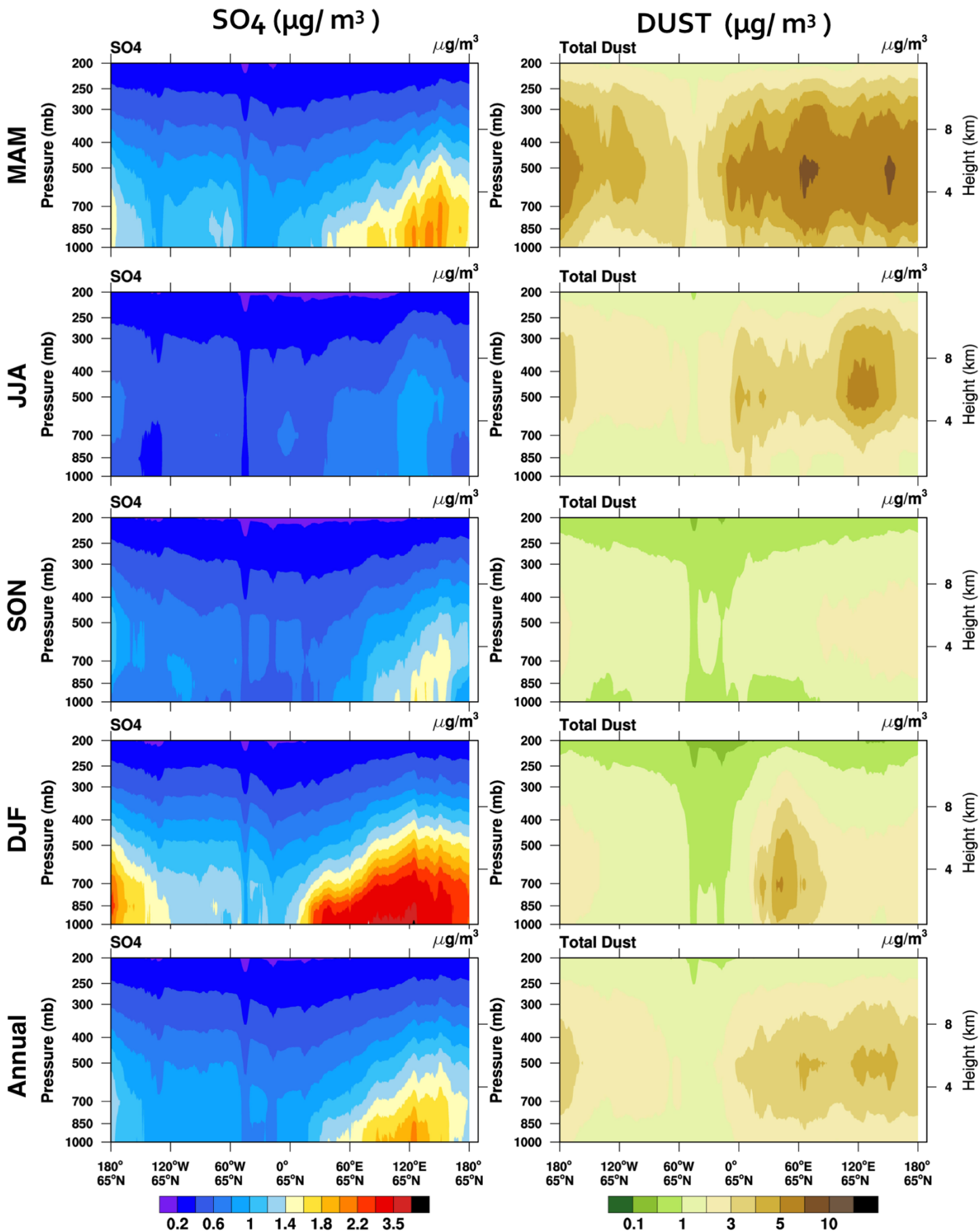


Figure S12: Cross-section at 65 °N for sulfate (left) and dust (right) at different seasons MAM denotes the average for months of March, April, and May. JJA denotes the average for months of June, July, and August. SON (bottom right panel) denotes average for months of September, October, and November. DJF denotes the average for the months of December, January, and February.

5