Atmospheric
Chemistry
and Physics

Supplement of

A model study investigating the sensitivity of aerosol forcing to the volatilities of semi-volatile organic compounds

Muhammed Irfan et al.
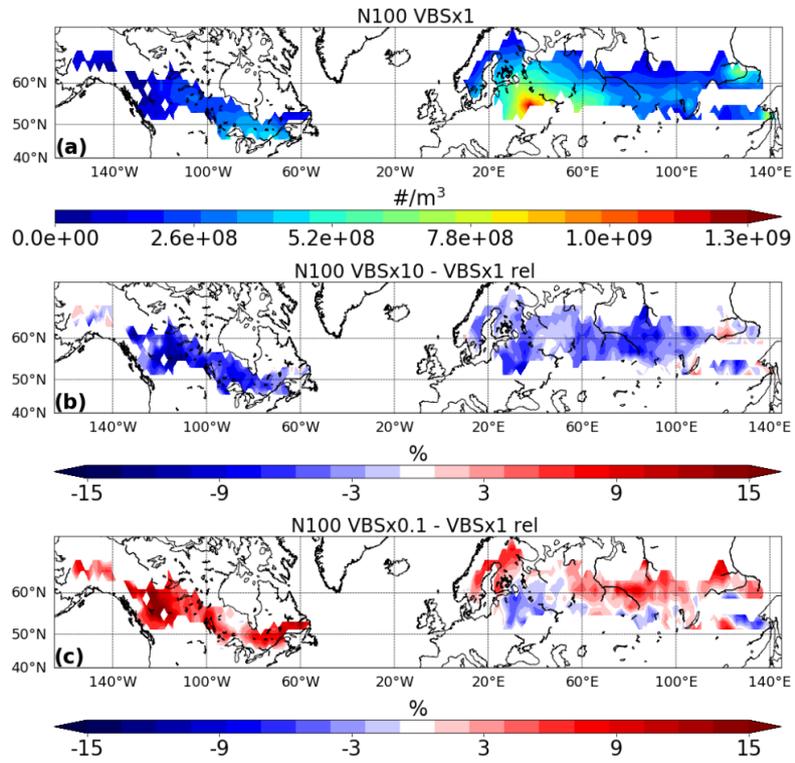
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Figure S1. Simulated CCN concentration of **(a)** VBS×1 and the relative difference between **(b)** VBS×10 and **(c)** VBSx0.1 with respect VBS×1 at 900 hPa
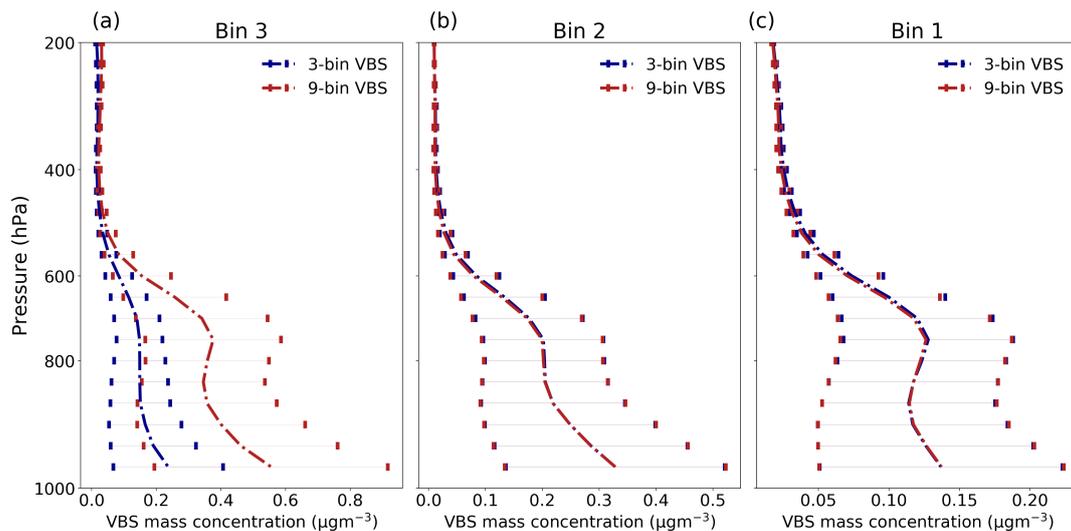
Figure S2. Mean vertical profile of VBS only mass concentrations from **(a)** bin 3 **(b)** bin 2 and **(c)** bin 1 in three-bin VBS setup and the cumulative mass concentrations in their corresponding bins from nine-bin VBS setup over the boreal-forest region. The error bar depicts 1-sigma standard deviation of the data calculated across different grid cells for each model level.
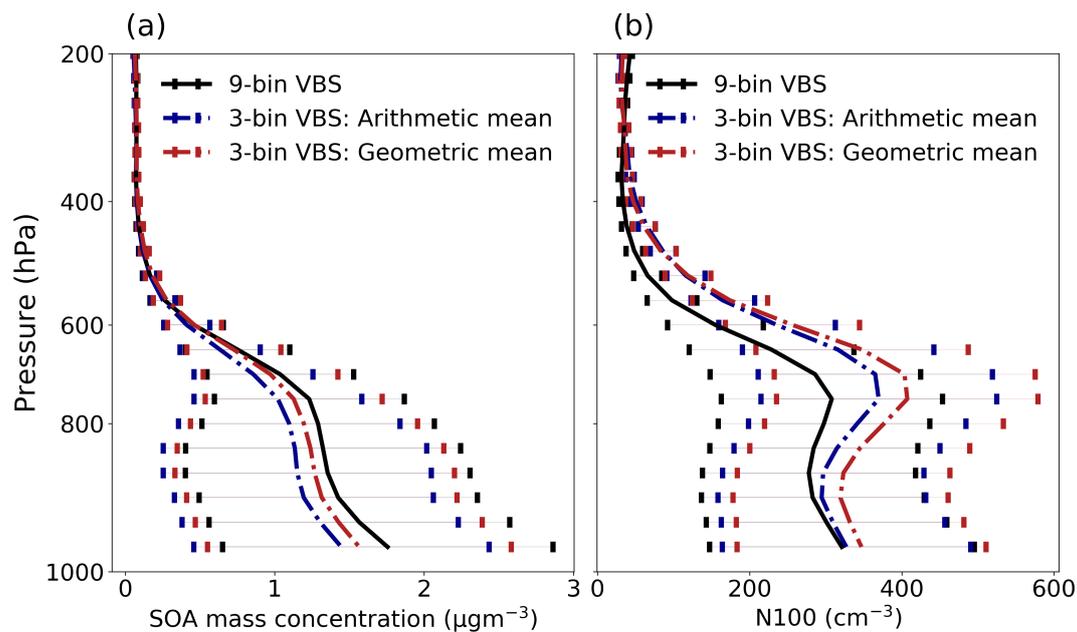

Figure S3. Mean vertical profile of (a) N100 and (b) SOA mass concentration for the base case nine-bin VBS setup, the three-bin VBS setup with volatility calculated using the arithmetic mean, and the three-bin VBS setup with volatility calculated using the geometric mean. The error bars depict the 1-sigma standard deviation of the data calculated across different grid cells for each model level.
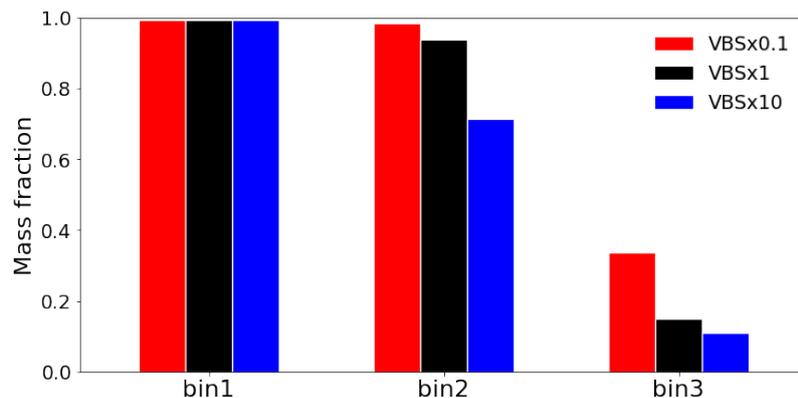
Figure S4. Fraction of particle phase mass concentration close to the ground level (particle/(particle+gas)) in each VBS bins with changes in volatility using the three-bin VBS setup. The x-axis values show the C_{sat} of that bin in the VBS×1 simulation
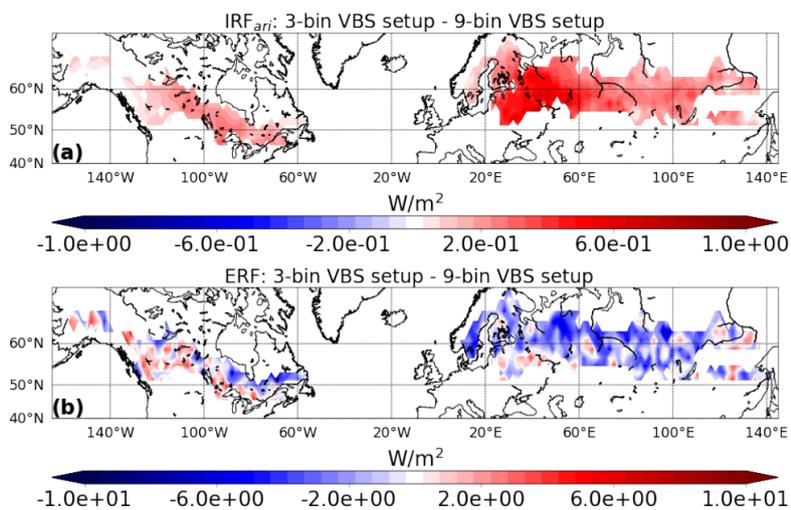

Figure S5. (a) TOA IRF$_{ari}$, **(b)** ERF for the three-bin VBS setup with respect to nine-bin VBS setup analysed over the boreal region.