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Supplement of

Observed microphysical changes in Arctic mixed-phase clouds when transitioning from sea ice to open ocean

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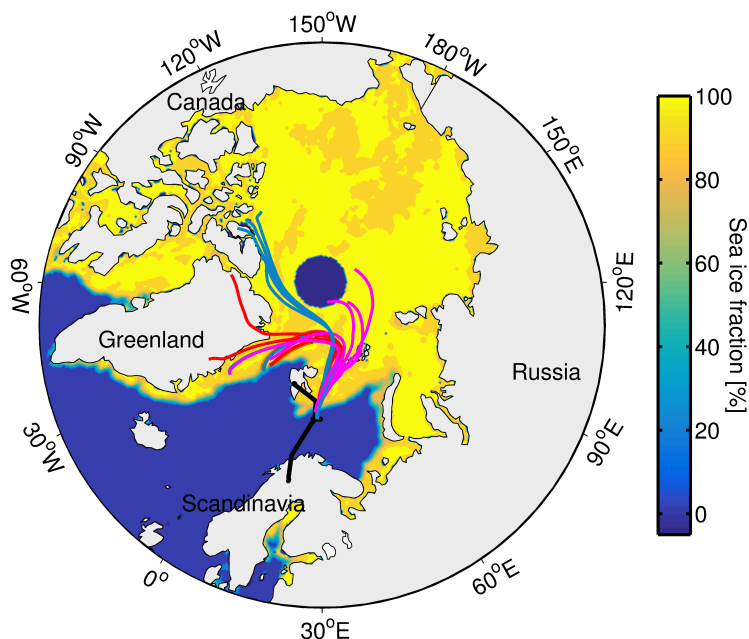


Figure S1: 3 day back trajectories for the B762 science period. Back trajectory analyses were calculated at 30 second intervals along each flight path using the National Oceanic and Atmospheric Administration HYbrid Single-Particle Lagrangian Integrated Trajectory (NOAA HYSPLIT 4.0) model (Draxler and Hess 1998), as described in Liu et al. (2015) and Young et al. (2016). GDAS re-analysis meteorology (Global Data Assimilation System; NOAA Air Resources Laboratory, Boulder, CO, USA) was used to simulate the 3D wind fields; however, turbulent motions are not resolved by the model and therefore some uncertainty is attached to the modelled trajectories (Fleming et al. 2012). A sample of trajectories modelled over the sea ice (red), MIZ (magenta) and ocean (blue) are shown. Sea ice concentration from the NSIDC is shown in colour, with the ocean and sea ice depicted in blue and yellow respectively. Sea ice data at the north pole are not included.

References

- R. R. Draxler and G. D. Hess. An Overview of the HYSPLIT_4 Modelling System for Trajectories, Dispersion, and Deposition. *Australian Meteorological Magazine*, 47:295–308, 1998.
- Z. L. Fleming, P. S. Monks, and A. J. Manning. Review: Untangling the influence of air-mass history in interpreting observed atmospheric composition. *Atmospheric Research*, 104:1–39, February 2012. doi: 10.1016/j.atmosres.2011.09.009.
- D. Liu, B. Quennehen, E. Darbyshire, J. D. Allan, P. I. Williams, J. W. Taylor, S. J.-B. Bauguitte, M. J. Flynn, D. Lowe, M. W. Gallagher, K. N. Bower, T. W. Choularton, and H. Coe. The importance of asia as a source of black carbon to the european arctic during springtime 2013. *Atmospheric Chemistry and Physics*, 15(20):11537–11555, 2015. doi: 10.5194/acp-15-11537-2015.
- G. Young, H. M. Jones, E. Darbyshire, K. J. Baustian, J. B. McQuaid, K. N. Bower, P. J. Connolly, M. W. Gallagher, and T. W. Choularton. Size-segregated compositional analysis of aerosol particles collected in the european arctic during the accacia campaign. *Atmospheric Chemistry and Physics*, 16(6):4063–4079, 2016. doi: 10.5194/acp-16-4063-2016.

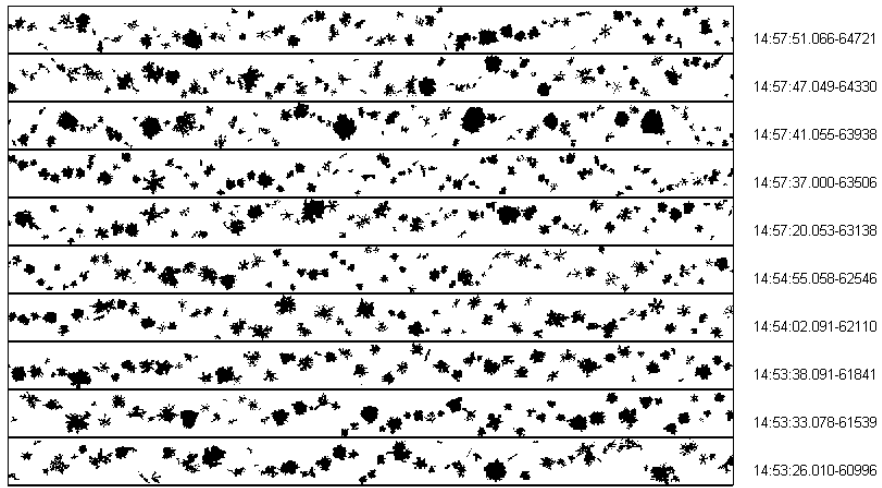


Figure S2: Example data from the CIP100 at cloud base over the ocean. Large dendrites are observed, with potential shattering events noted. Vertical width of image strip represents a size range of 6.4 mm.