



Supplement of

Shipborne observations reveal contrasting Arctic marine, Arctic terrestrial and Pacific marine aerosol properties

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Figure S1. The monthly mean Chlorophyll-*a* concentration in September 2017 (an index of phytoplankton biomass over the ocean) obtained from Satellite data (Aqua Moderate Resolution Imaging Spectroradiometer). The dotted red lines indicate the domains for Arctic Ocean (65°N-74°N and 170°E-120°W) and Pacific Ocean (40°N-65°N and 145°E-168°W).



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Figure S2. The monthly mean sea-ice concentration in September 2017 obtained from the Sea Ice Index
(SII) provided by the National Snow and Ice Data Center, (<u>https://doi.org/10.7265/N5K072F8</u>).



Figure S3. Correlations between (a) CN_{2.5} and N_{NUC}, (b) CN_{2.5} and N_{AIT}, (c) CN_{2.5} and N_{ACC}, and (d)
 CN_{2.5} and N_{OPS} during the entire sampling periods



Figure S4. Comparisons of hourly average particle number concentrations in the 10 – 64 nm size range
 measured with nano SMPS and standard SMPS



35 Figure S5. Weekly averaged liquid cloud fraction from Aqua/MODIS retrieval data for (a) week

36 1(8/29/2017-9/5/2017), (b) week 2 (9/6/2017-9/13/2017), week 3 (9/14/2017-9/21/2017), and week 4

37 (9/22/2017-9/29/2017). Data were obtained from https://neo.sci.gsfc.nasa.gov/.



Figure S6. Growth rate for the different mode particles. Mode 1 is the smallest mode and Mode 2 thenext smallest, etc.