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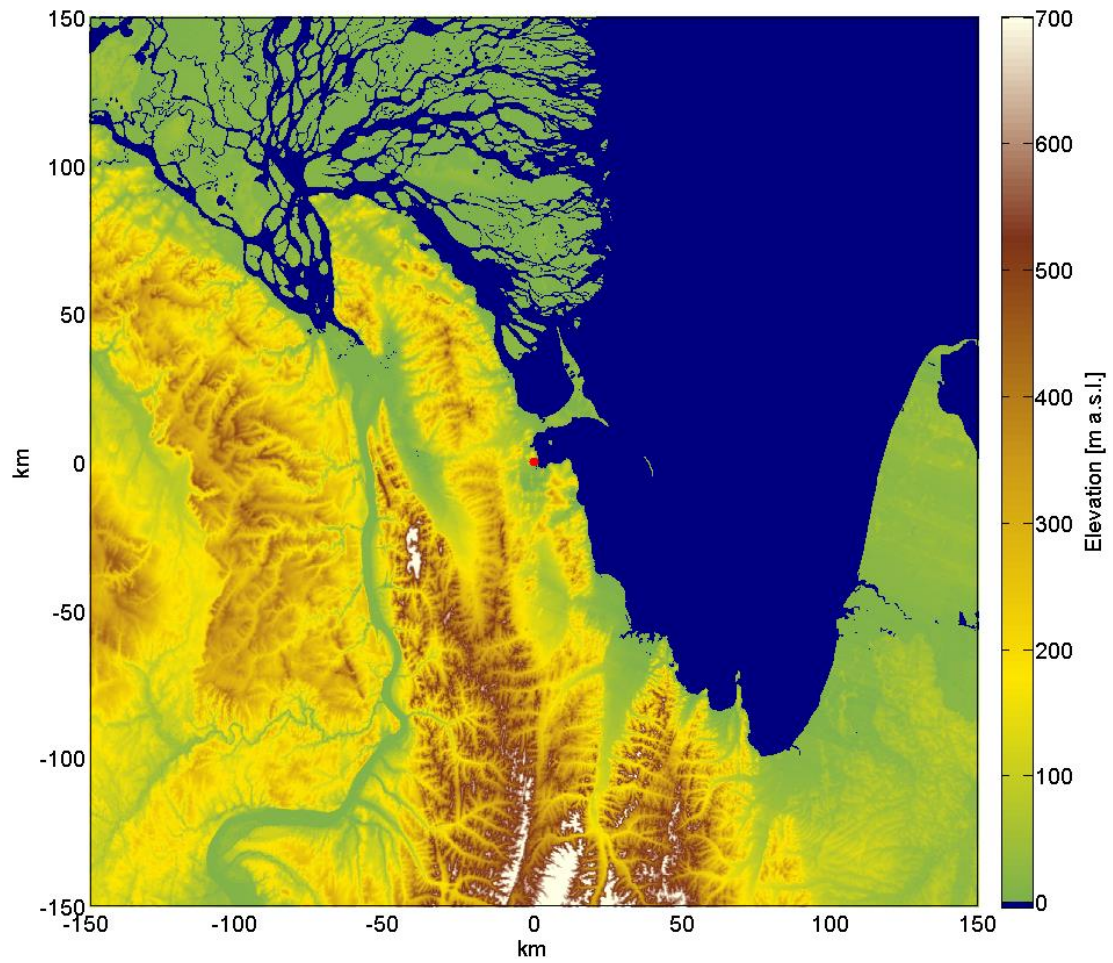
Supplement of

Aerosol size distribution seasonal characteristics measured in Tiksi, Russian Arctic

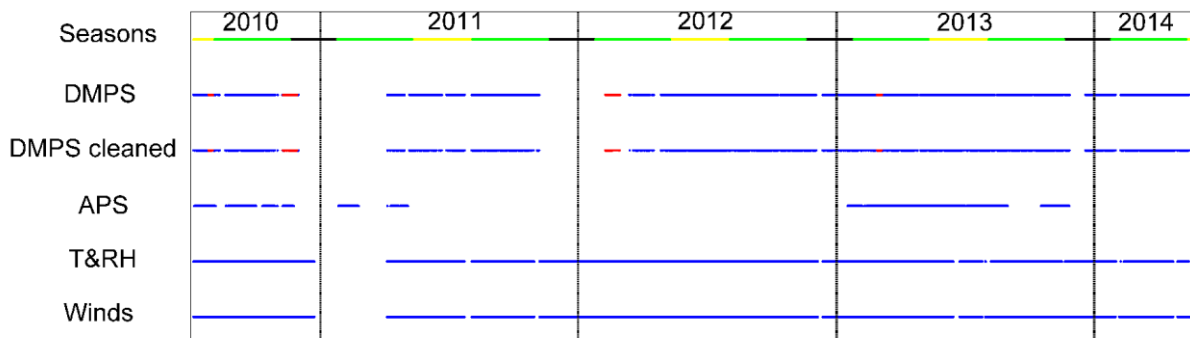
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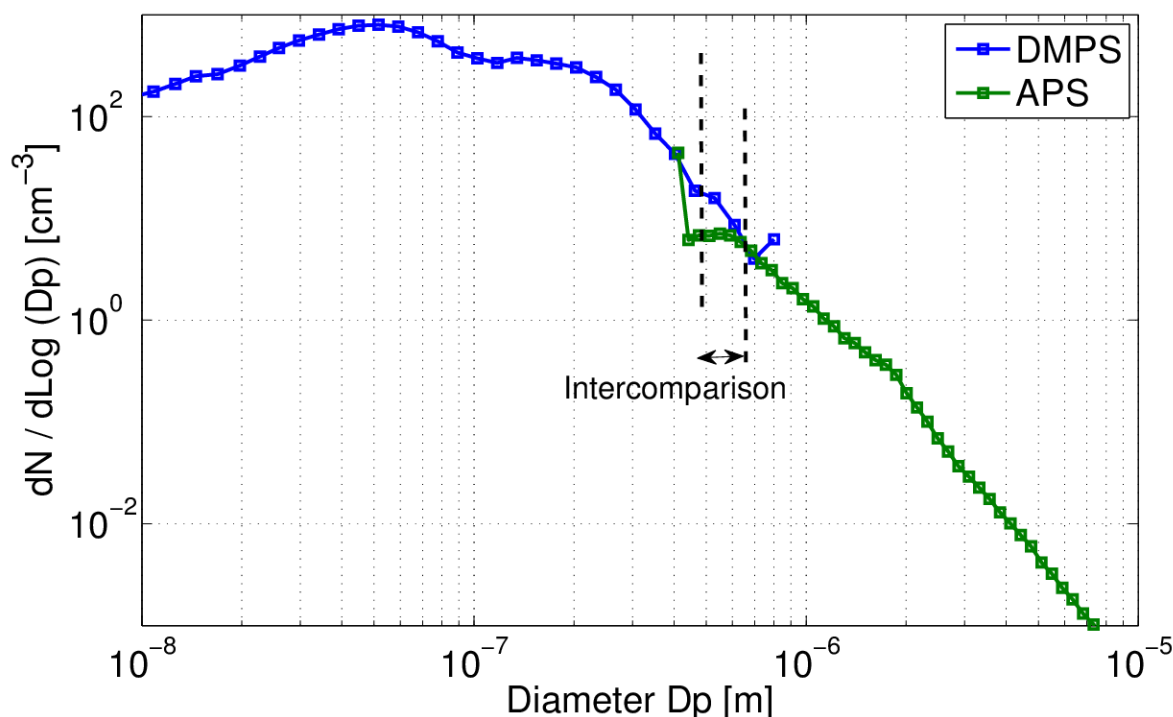
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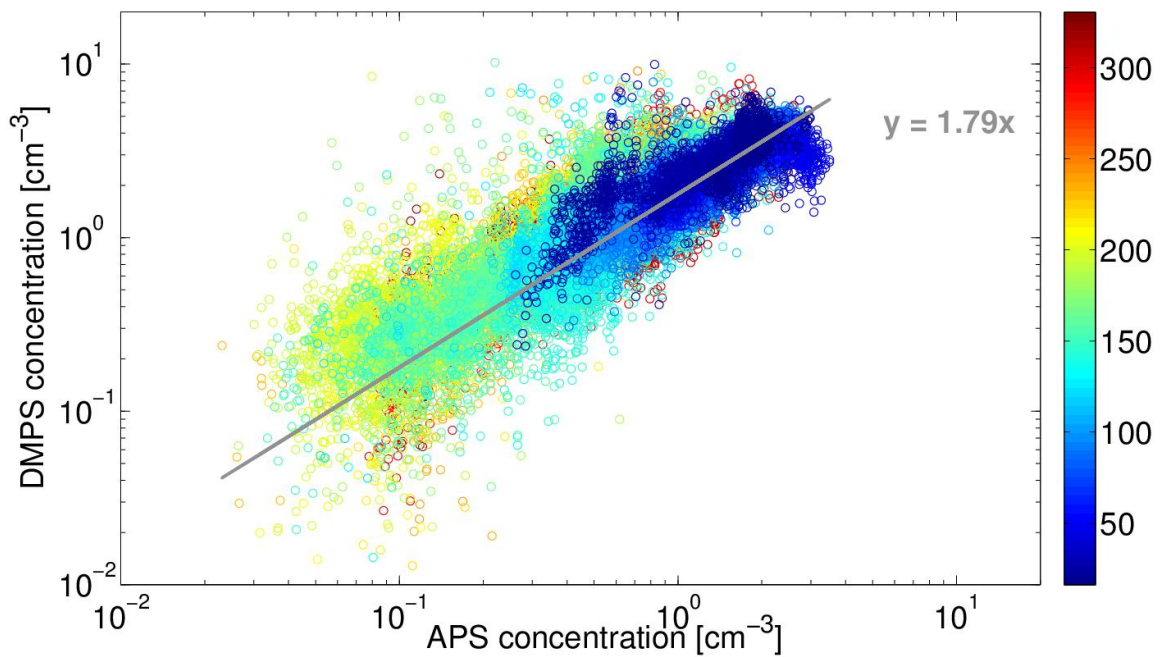
S1. Topographic map of surroundings of Tiksi measurement station at 150 km distance, showing the delta of river Lena (north-west), fjell of mountains (south) and Laptev Sea (north-east) (United States Geological Survey, 2015).



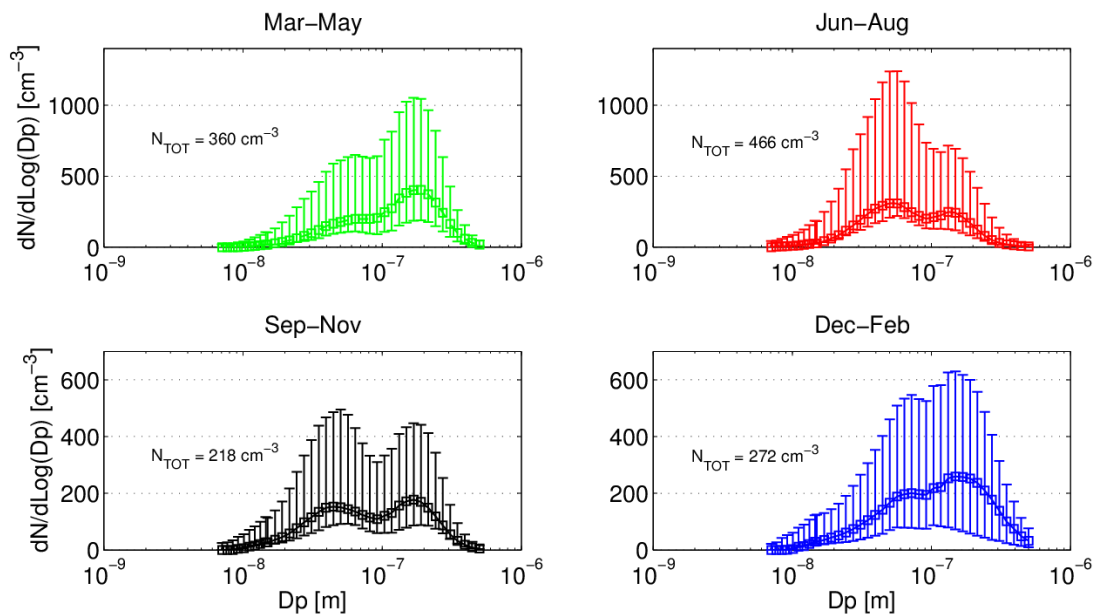
S2. Data coverage illustrated for the period of measurements 5 Jul 2010 -- 30 May 2014. X-axis shows the time with the years separated by black dotted lines. The uppermost colorband denotes the changing seasons with colors: black, yellow and green presenting the periods of polar night, midnight sun and that in between, respectively. The blue colorbands show the data coverage for DMPS, DMPS cleaned data, APS, temperature and RH, and wind speed and direction. The overall data coverage from DMPS in our measurements was 74%, but additional 36% of those were lost in data cleaning. The data coverage for APS was 30%, and for meteorological (T, RH, winds and radiation) measurements 76%. The periods when DMPS measurements extent to only 15 nm lower limit are additionally marked with red colorbands.



S3. Average number size distributions from DMPS and APS during the period of data intercomparison, plotted on a mobility diameter scale with the assumption of particle density of 1.5 g cm^{-3} . The size range used for comparing data is illustrated with black dashed lines.

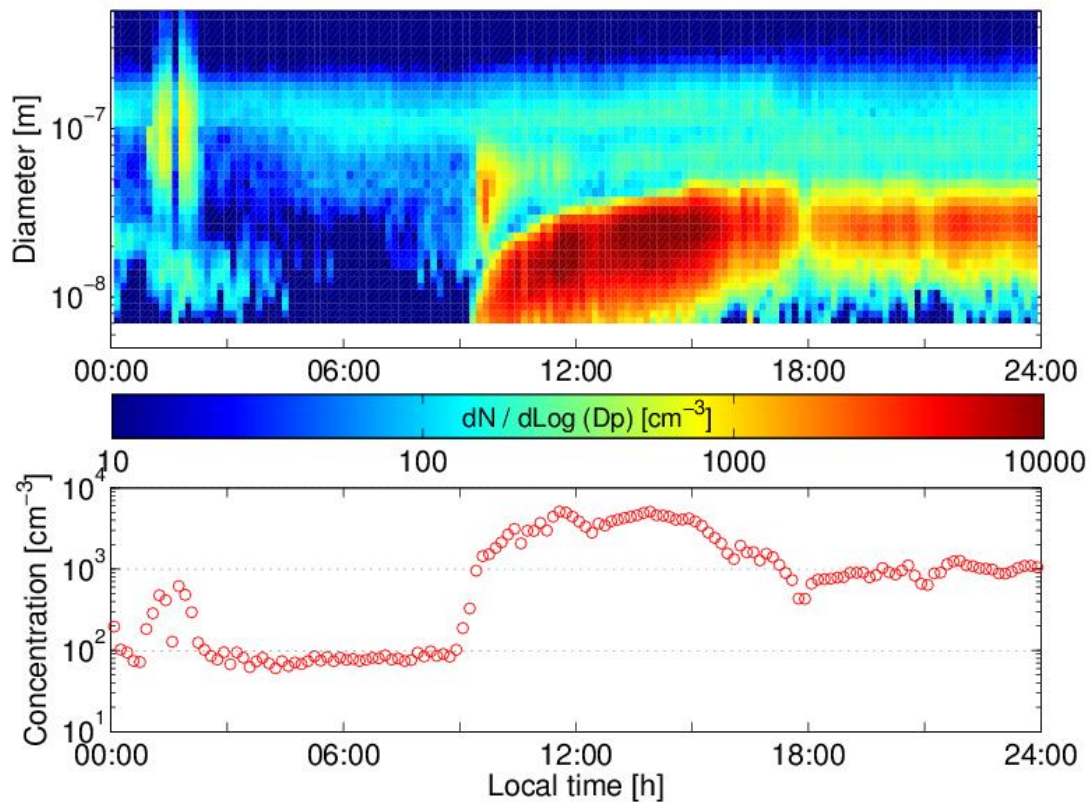


S4. Scatter of DMPS number concentration versus APS number concentration (size range 493--658 nm) for the period of overlapping measurements in year 2013. Color indicates the day of year (with one being equal to Jan 1). The grey line shows the linear fit with zero-intercept done for the data gives a slope of 1.79.

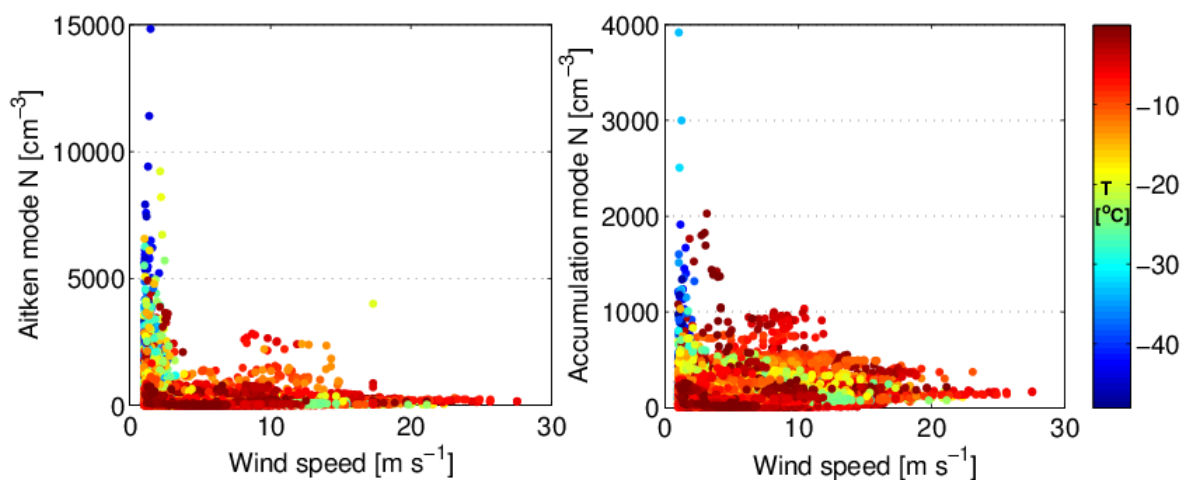


S5. Median number size distributions for different seasons: a) spring (March--May), b) summer (June--August), c) autumn (September--November) and d) winter (December--February), with whiskers presenting the quartiles of the data.

Tiksi 23 July 2013



S6. An example of class1 secondary particle formation event observed in Tiksi in summer 2013 on July 23. Upper panel shows the temporal evolution of size distribution (local solar time, UTC+9h). Particle size between 7 nm and 500 nm is shown on y-axis and color is proportional to particle number. Lower panel shows the temporal evolution of the total particle number, integrated from the size distribution measurements.



S7. Dependence of Aitken (25--100 nm) and accumulation (100--500 nm) mode concentrations on wind speed for days of negative temperatures. Colorbar shows the range of temperatures for each measured point.