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Supplement of

Developing and bounding ice particle mass- and area-dimension expressions for use in atmospheric models and remote sensing

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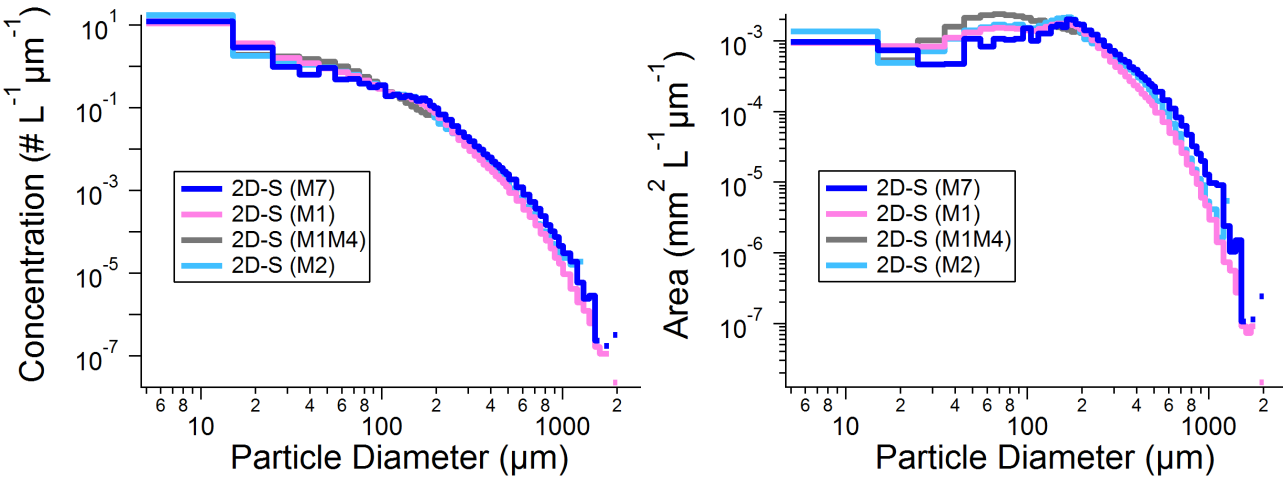
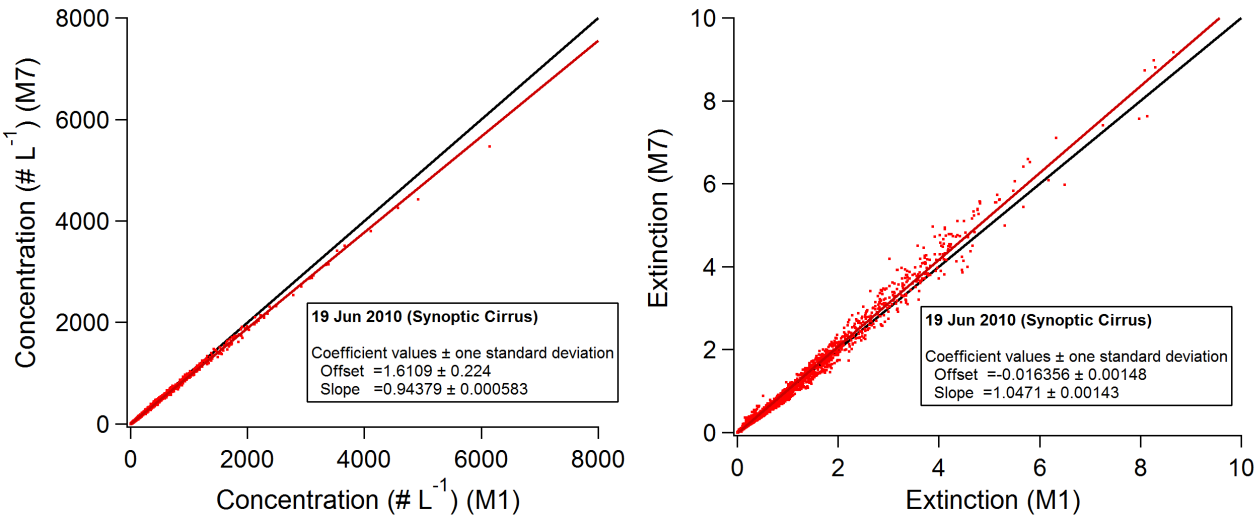


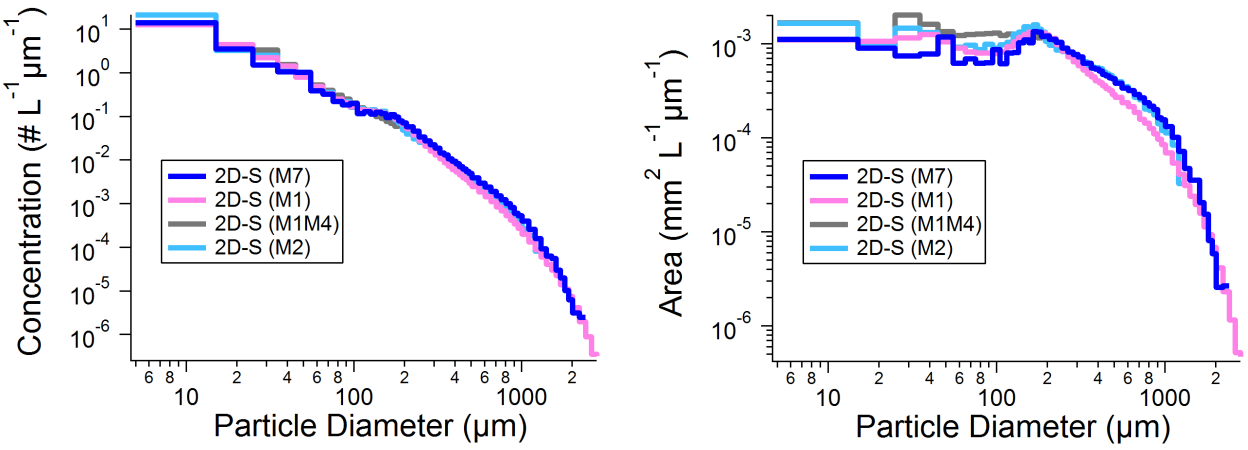
(a) (b)

Figure S1. (a) Ice particle number concentration and (b) ice particle projected area concentration as functions of maximum dimension for various processing method of 2D-S data during flight A on 19 Jan. 2010 (as example of synoptic cirrus clouds). Courtesy of Paul Lawson and Sara Lance.



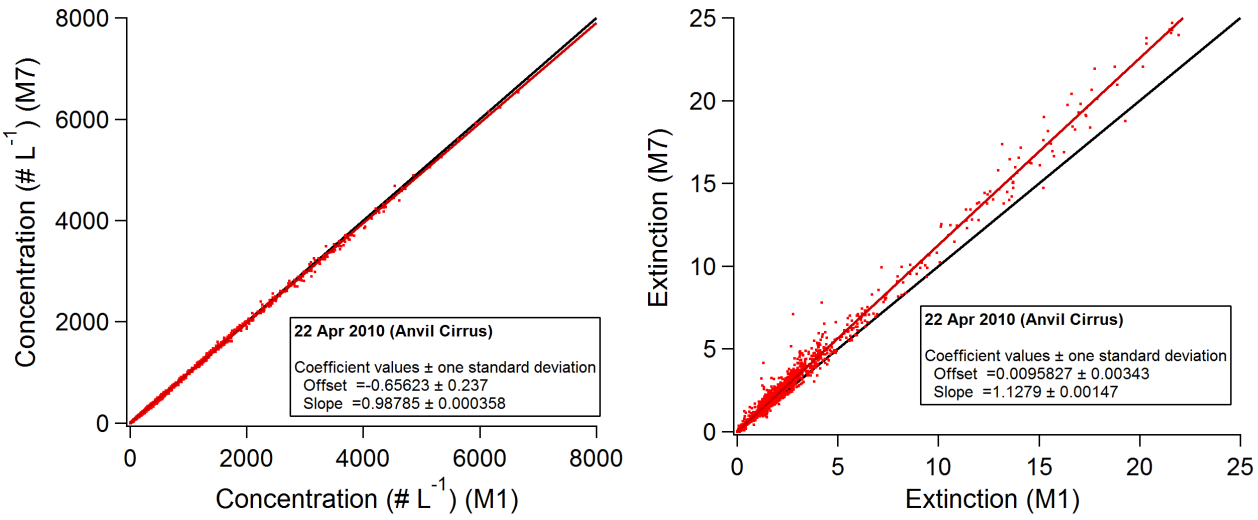
(a) (b)

Figure S2. (a) PSD number concentration from 2D-S M7 versus PSD number concentration from 2D-S M1, (b) extinction from 2D-S M7 versus extinction from 2D-S M1 during flight A on 19 Jan. 2010 (as example of synoptic cirrus clouds). Red line shows regression line to the data points, and black line displays 1:1 line. Courtesy of Paul Lawson and Sara Lance.



(a) (b)

Figure S3. Same as Fig. S1, but during flight A on 22 Apr. 2010 (as example of anvil cirrus clouds). Courtesy of Paul Lawson and Sara Lance.



(a) (b)

Figure S4. Same as Fig. S2, but during flight A on 22 Apr. 2010 (as example of anvil cirrus clouds). Courtesy of Paul Lawson and Sara Lance.

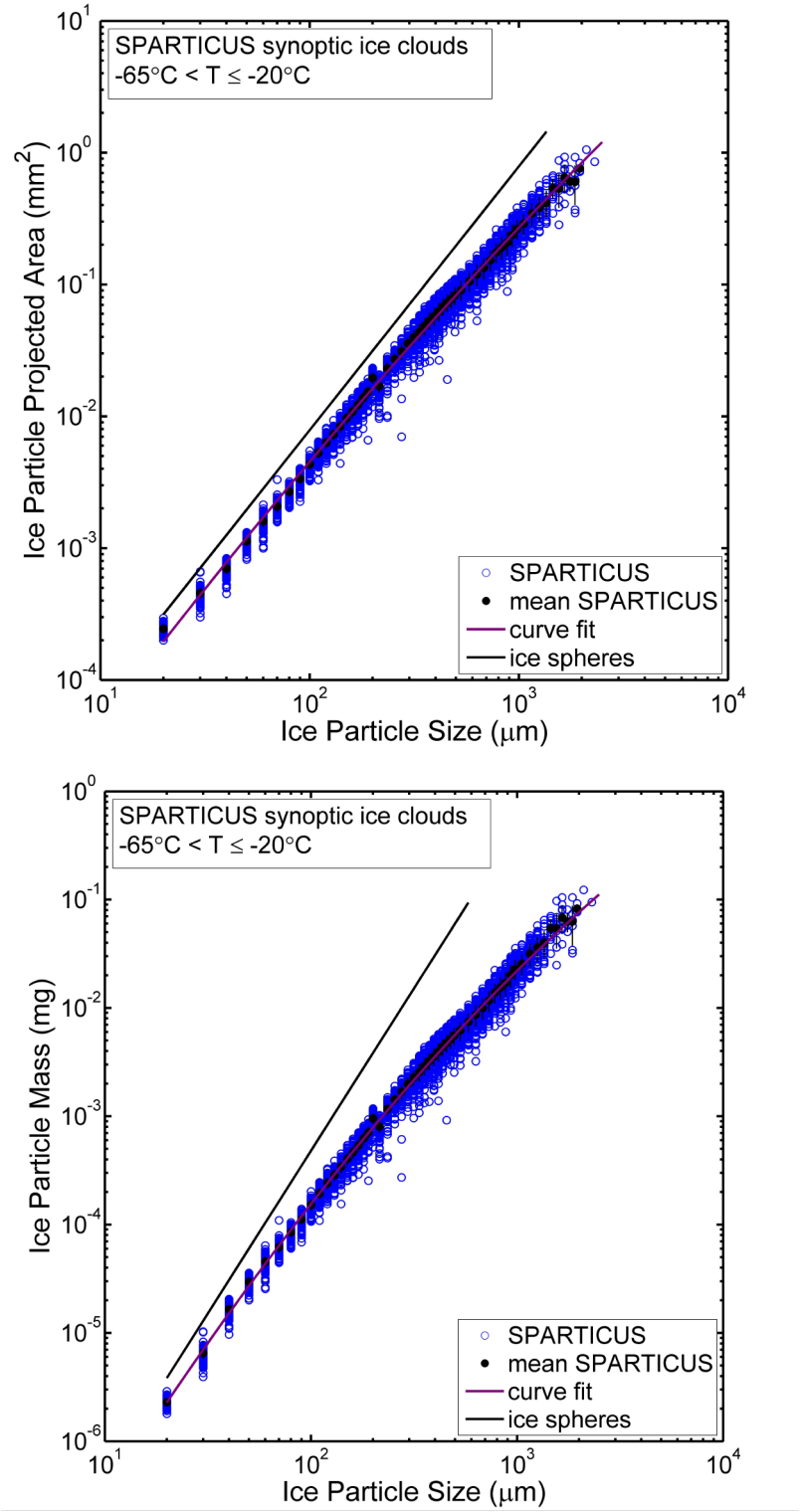


Figure S5. Dependence of (a) ice particle projected area and (b) ice particle mass on *D* based on actual PSDs regardless of temperature dependency. The SPARTICUS 2D-S data has been grouped into size-bins.

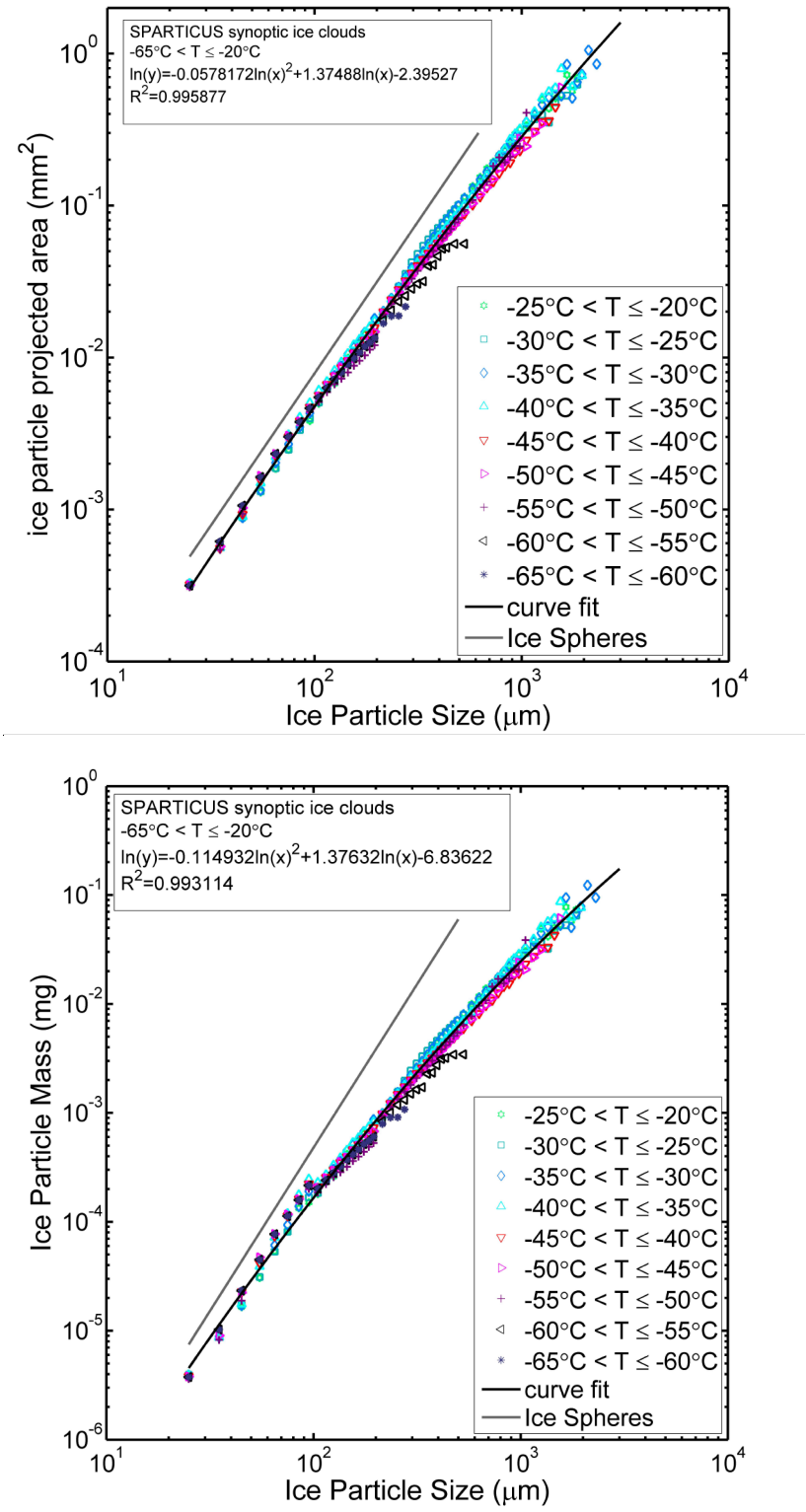


Figure S6. Dependence of (a) ice particle projected area and (b) ice particle mass on *D* based on mean PSD within the indicated temperature regime. The CPI and 2D-S data have been grouped into size-bins and 5 °C temperature intervals, and the black solid curve is a fit to these datasets.