



Supplement of

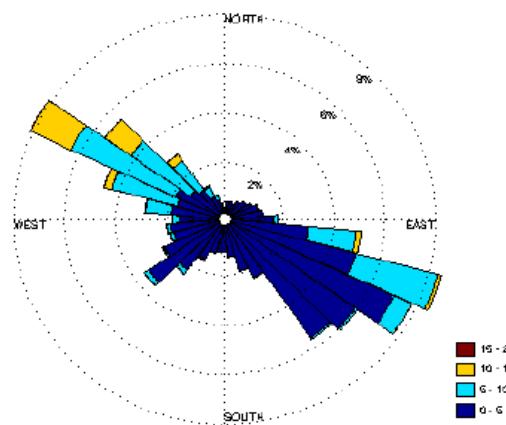
Controlled meteorological (CMET) balloon profiling of the Arctic atmospheric boundary layer around Spitsbergen compared to a mesoscale model

T. J. Roberts et al.

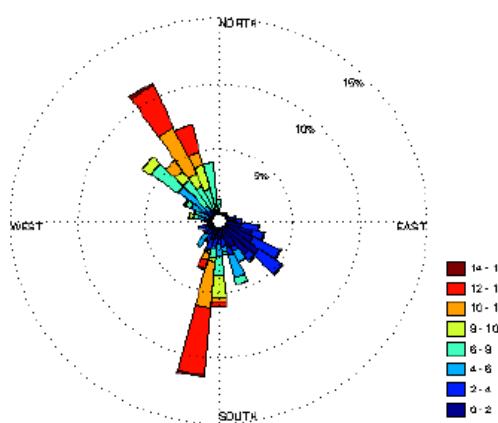
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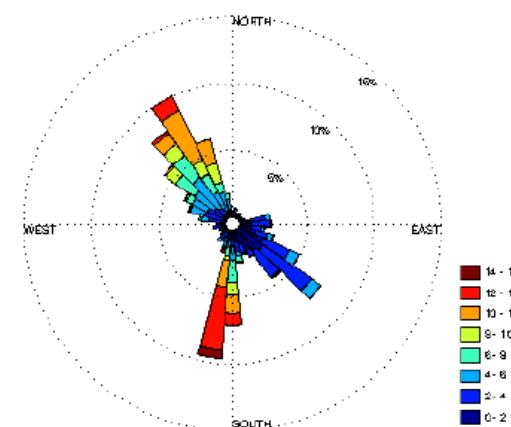
Observed



Model - YSU



Model - MYJ



Model - QNSE

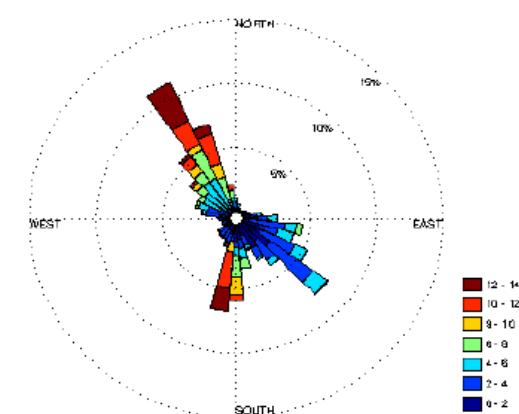


Figure S1. Windrose diagrams of the measured and modelled Ny-Alesund 10 m windvector from 03 May to 12 May. a: observed, b: modelled with YSU scheme, c: modelled with MYJ scheme, d: modelled with QNSE scheme.

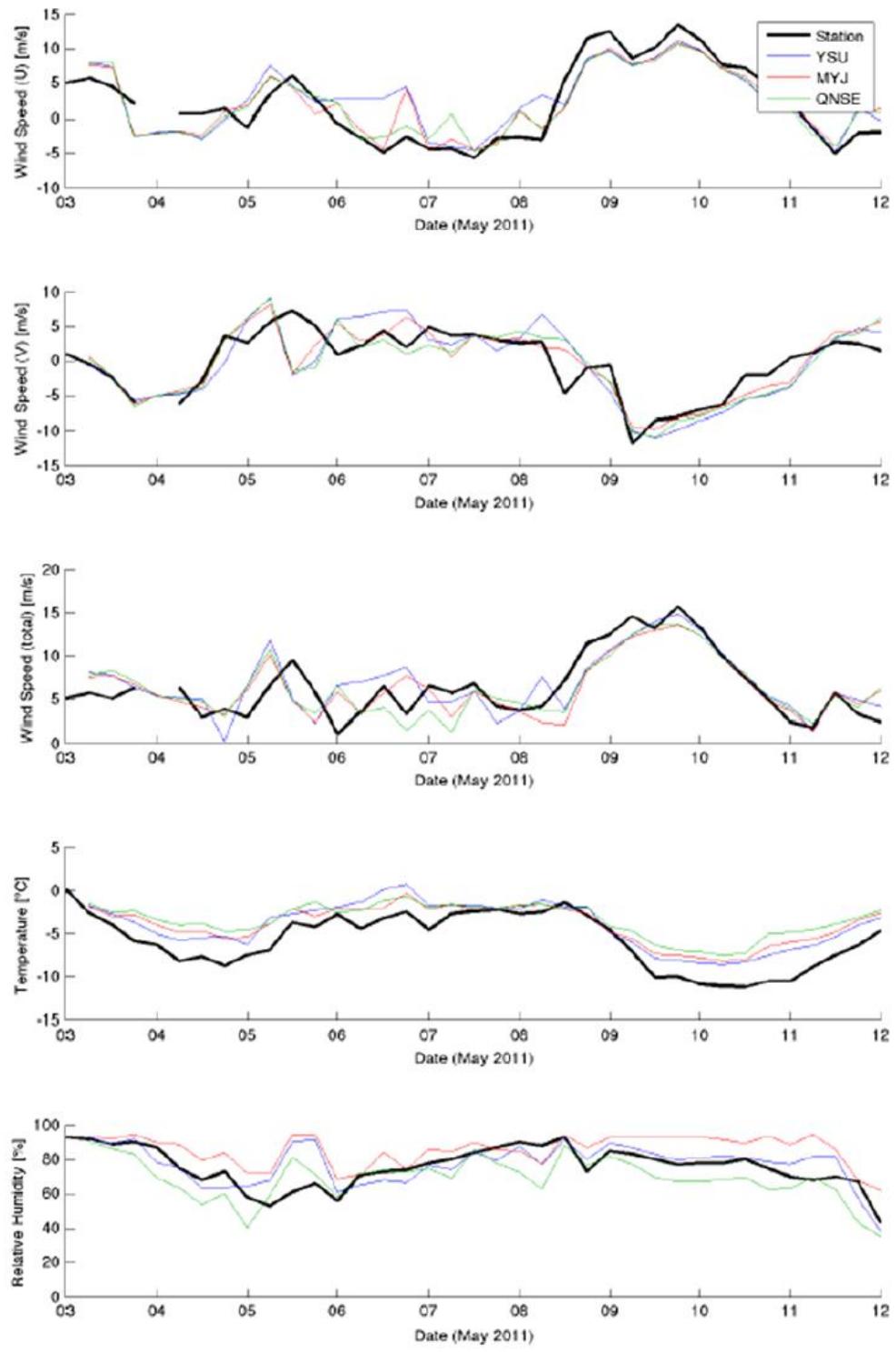
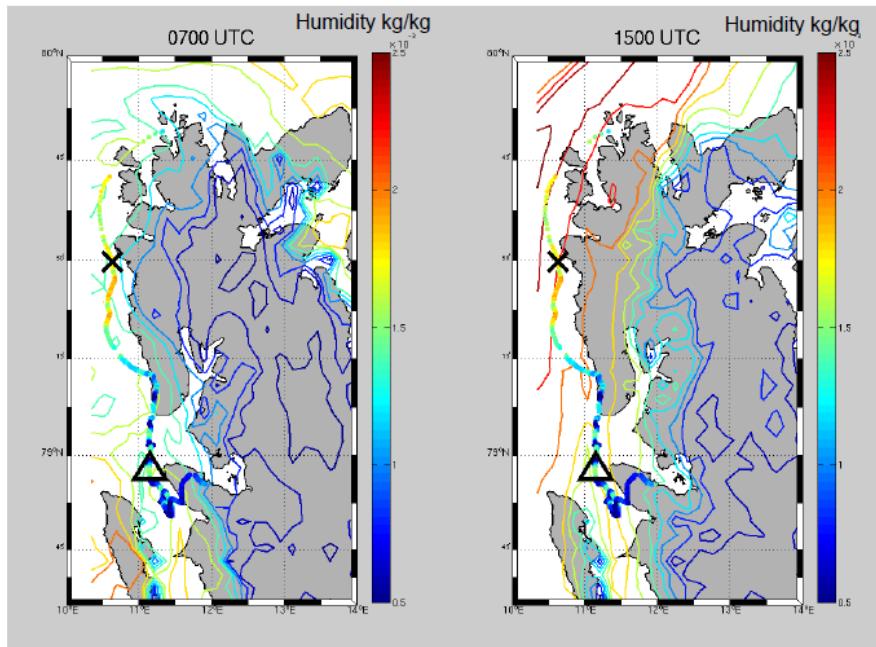


Figure S2. 6 hourly averaged meteorology time-series from the Verlegenhukken station compared to WRF model simulation with 3 boundary layer schemes (YSU, MYJ, QNSE).

YSU



QNSE

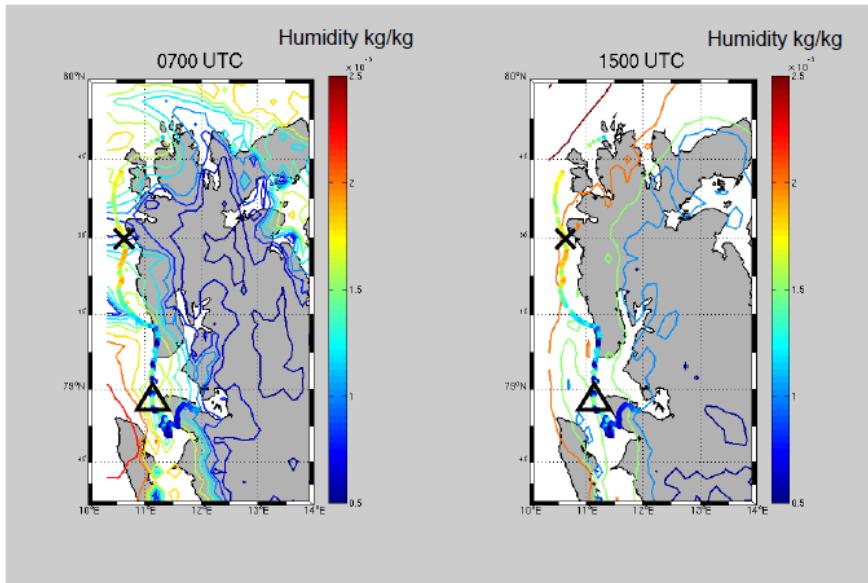


Figure S3. As for Figure 11 for the two other boundary layer schemes: YSU and QNSE. Absolute humidity (kg/kg) in the WRF model layer corresponding to 300 masl (over oceans) at 07h and 15h compared to the CMET flight 5 whilst it performed automated ABL soundings centred around ~300 masl. The CMET balloon position at 07h is marked by a triangle and at 15h is marked by a cross. Data from the final stages of the balloon flight (at greater than ~1000 m asl thus not probing the ABL) has been omitted for clarity.

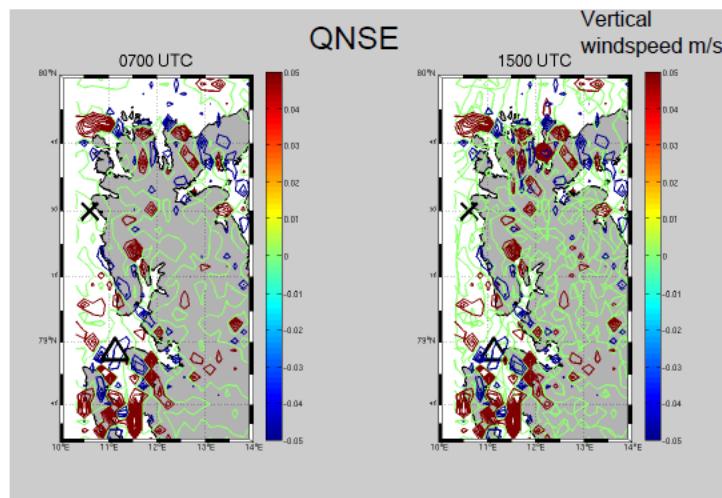
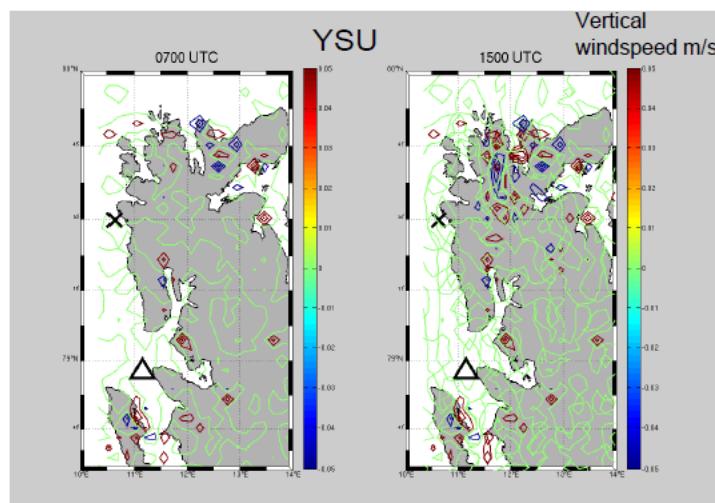
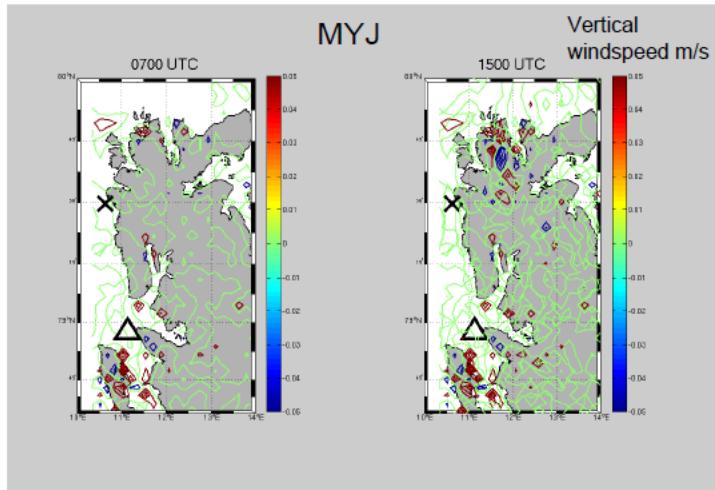


Figure S4. Vertical winds according to the WRF model layer corresponding to 300 masl (over oceans) for the three ABL schemes on 11 May, at 07 and 15h. Location of the CMET at these times is denoted by a triangle and cross respectively.