Supplements

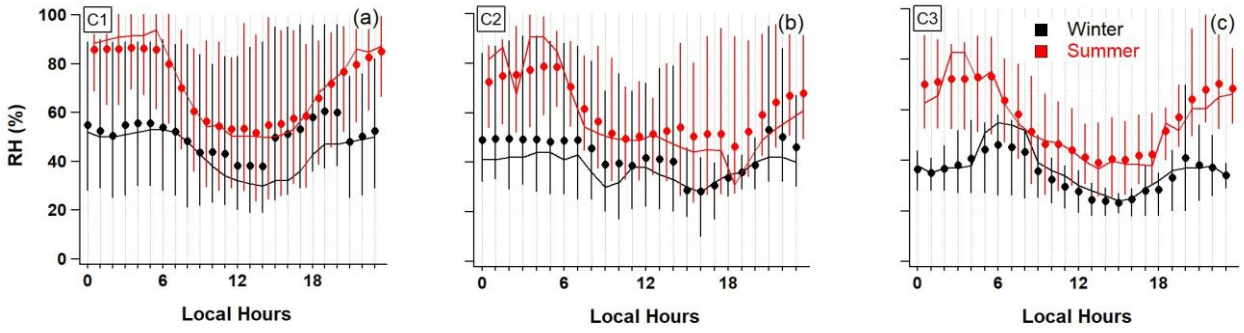

Fig. S1. Diurnal variarions of RH for the three PBL types in both seasons. The solid circles, lines and whiskers denote the mean, median, 25th, 75th percentile respectively.

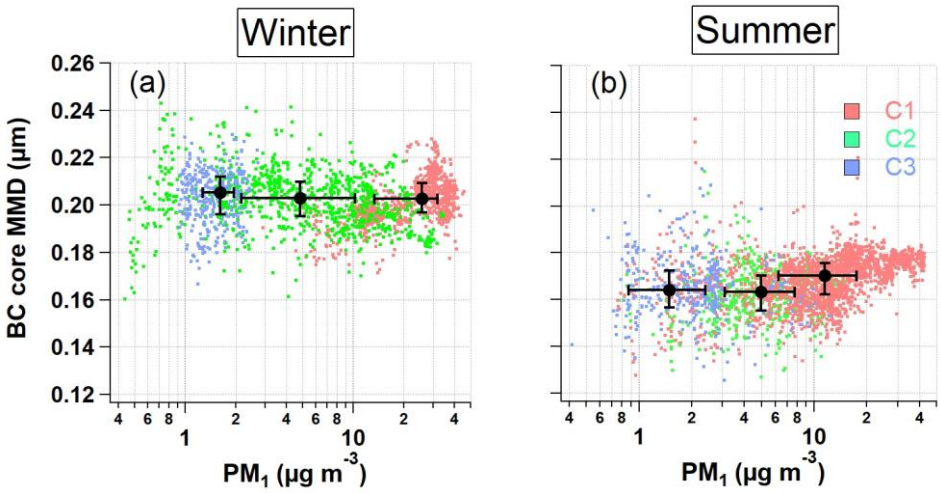

Fig. S2. BC core MMD as a function of PM_1 in winter (a) and summer (b) for the three PBL types, with solid circles, whiskers denoting the median, 25th, 75th percentiles.

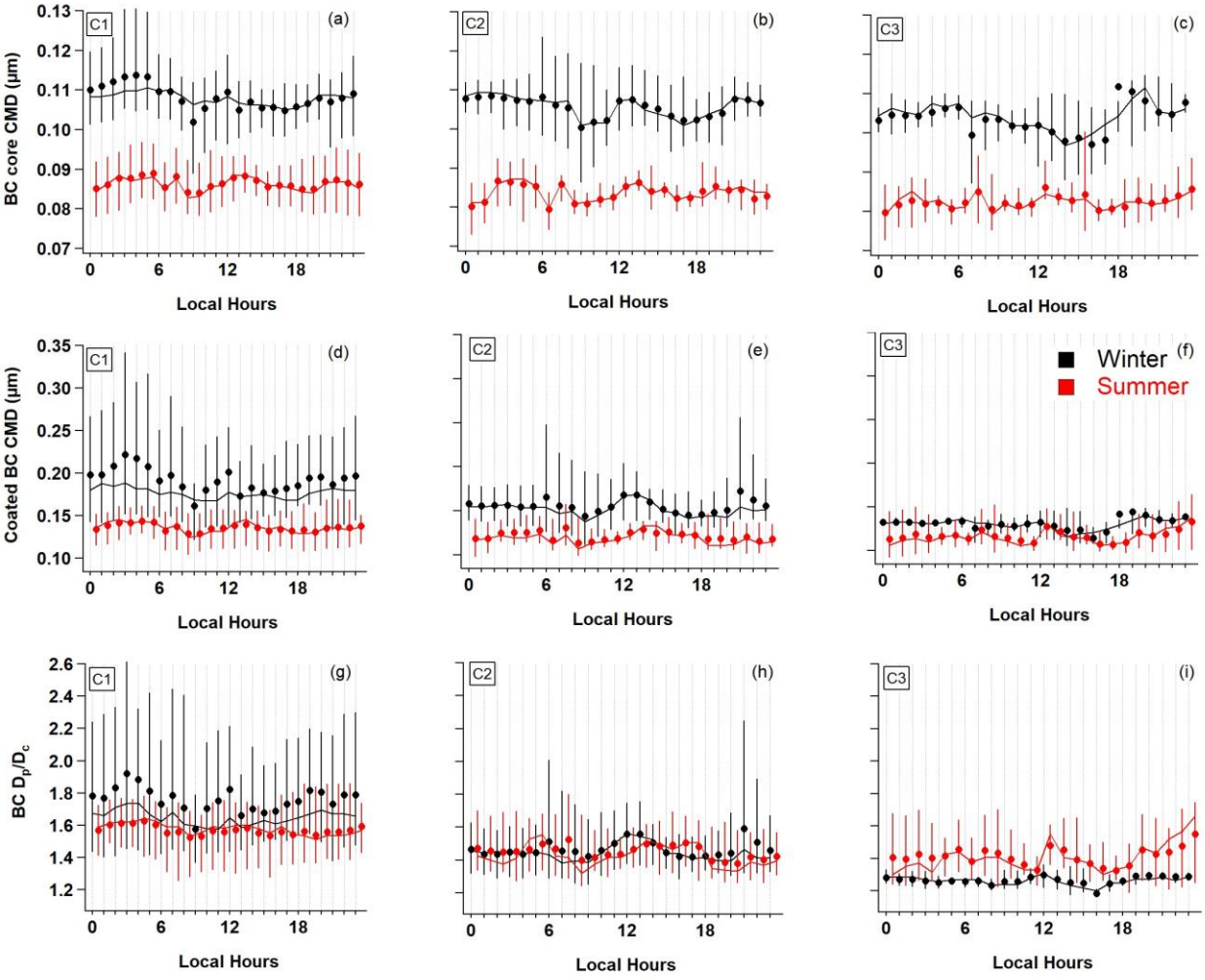

Fig. S3. Diurnal variarions of BC core CMD (a-c), BC coated CMD (d-f) and BC D_p/D_c (g-i) for the three PBL types in both seasons. The solid circles, lines and whiskers denote the mean, median, 25th, 75th percentile respectively.

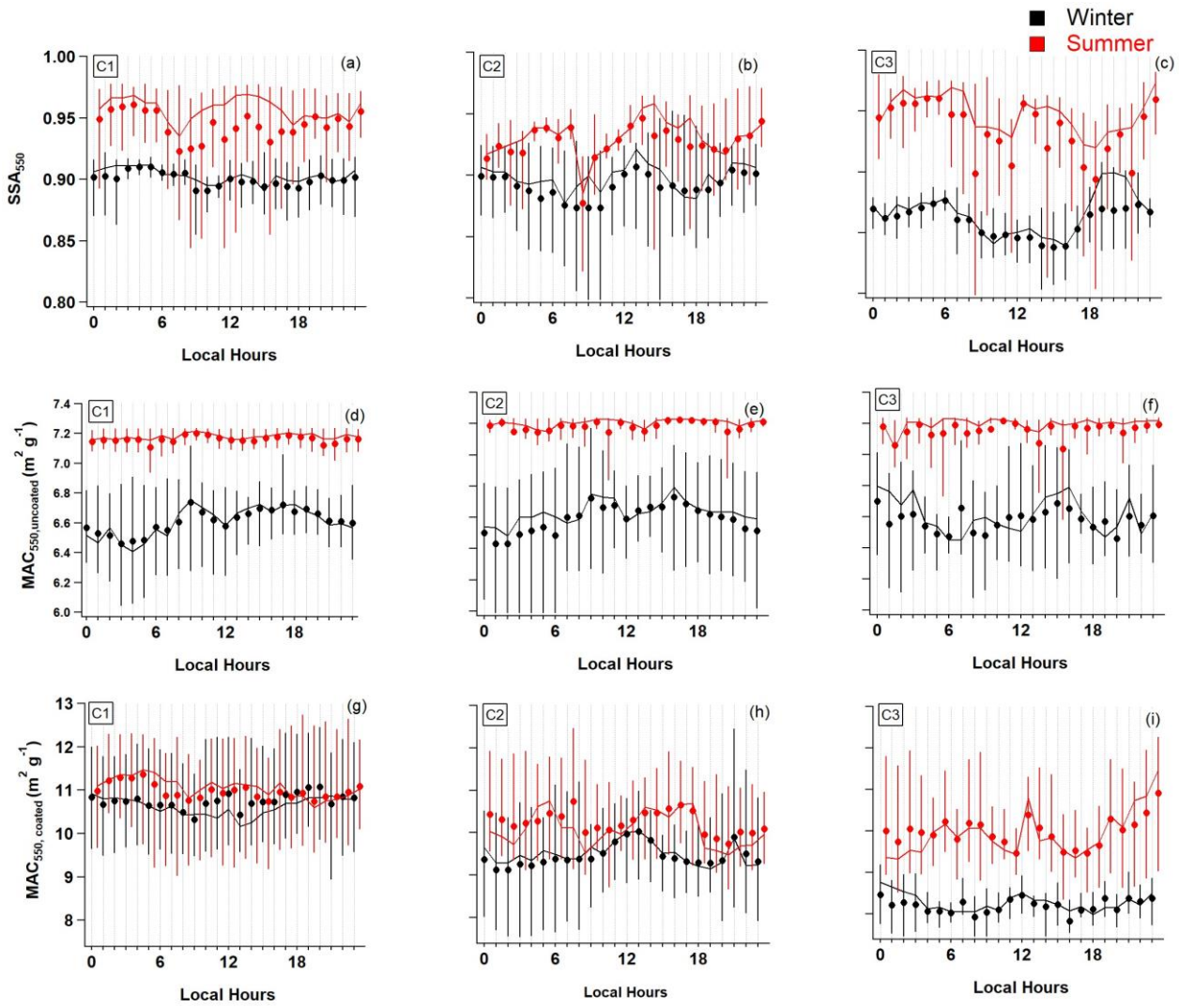

Fig. S4. Diurnal variarion of SSA_{550} (a-c), $MAC_{550,uncoated}$ (d-f) and $MAC_{550,coated}$ (g-i) for the three PBL types in both seasons. The solid circles, lines and whiskers denote the mean, median, 25^{th}, 75^{th} percentile respectively.

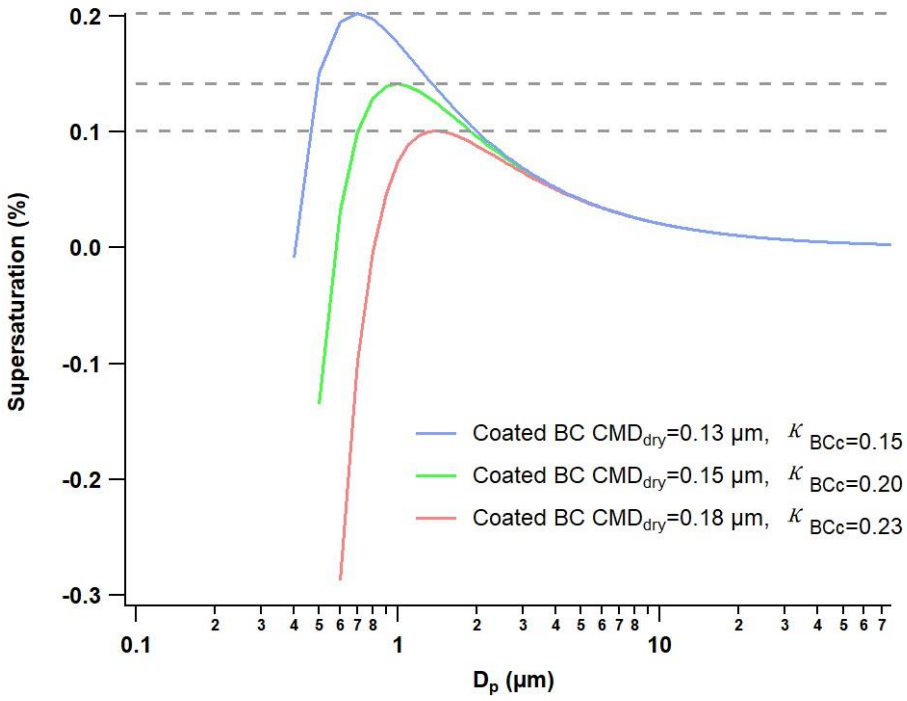

Fig. S5. Examples of critical supersaturation calculation for the three typical BC containing particles, using the coated BC CMD and corresponding κ_{BCc} as inputs. The dashed line denotes the critical supersaturation to activate the BC with given CMD and κ_{BCc}.