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Supplement of

Observed impacts of aerosol concentration on maritime tropical convection within constrained environments using airborne radiometer, radar, lidar, and dropsondes

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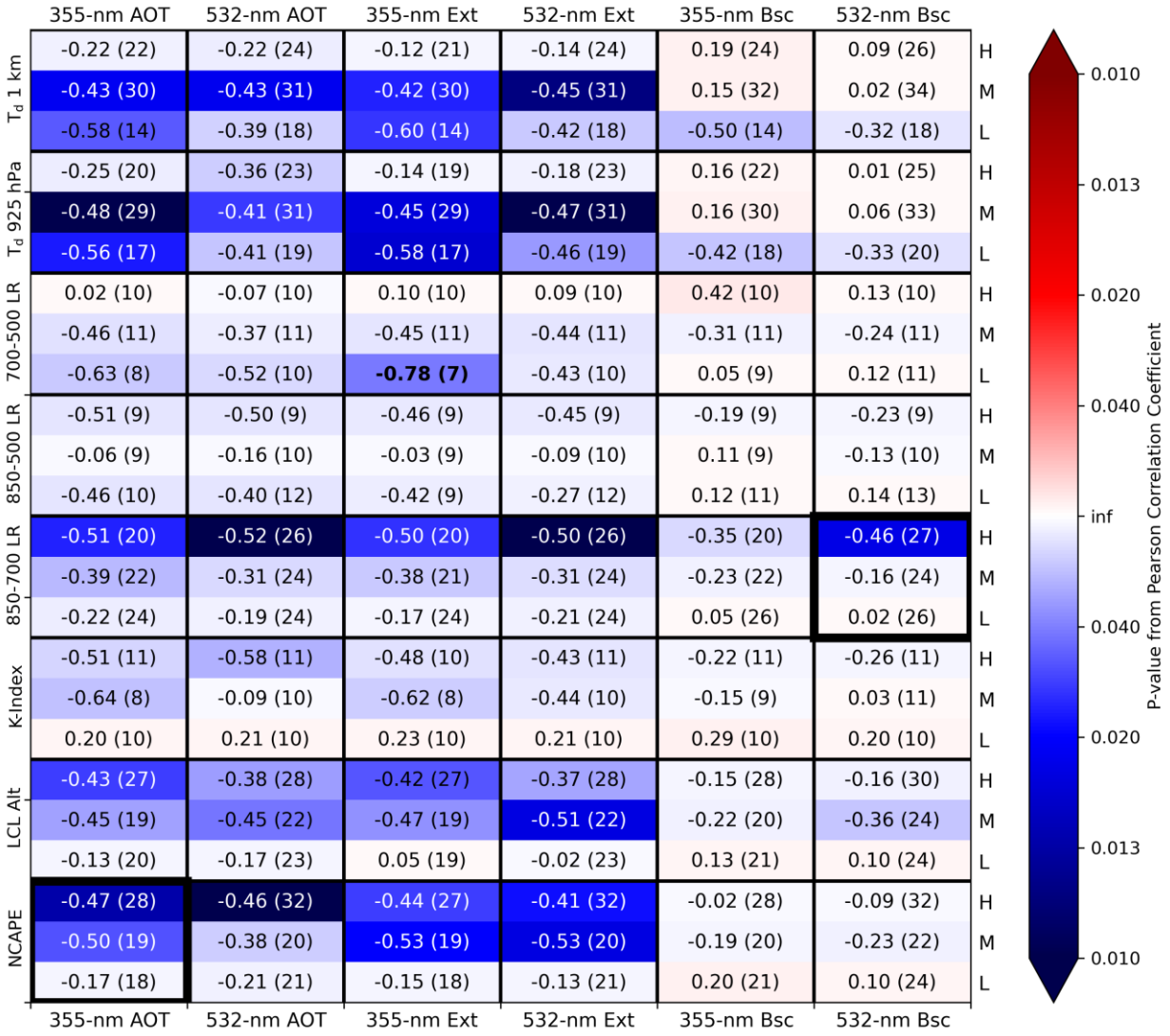

Figure S1: Pearson correlation coefficients from comparing p95 AMPR CLW with mean HSRL2 AOT, extinction (Ext), and backscatter (Bsc) at 355 and 532 nm (top and bottom borders) within environmental bins stratified by the eight AVAPS parameters (left border) at low (L), medium (M), and high (H) magnitudes (right border) across the CAMP^{2}Ex scenes. AVAPS magnitudes were stratified using the values of Test 2 (Table 2 in the main text). Within each cell, the listed value is the Pearson correlation coefficient and the parenthesized value indicates the mean number of data points used in the (bootstrapped) comparison. Cells with a Pearson correlation coefficient ≥ 0.70 contain bolded text. Reds (blues) represent positive (negative) Pearson correlation coefficients, and the color shading corresponds to the magnitude of the p-value according to the colorbar, with darker shades of each color associated with lower p-values (i.e., greater statistical significance). Color shading begins to increase substantially around a p-value of 0.05 and reaches a maximum for p-values around 0.01. Thicker boxes outline the two correlation sets illustrated in Figs. S2a and S2b.

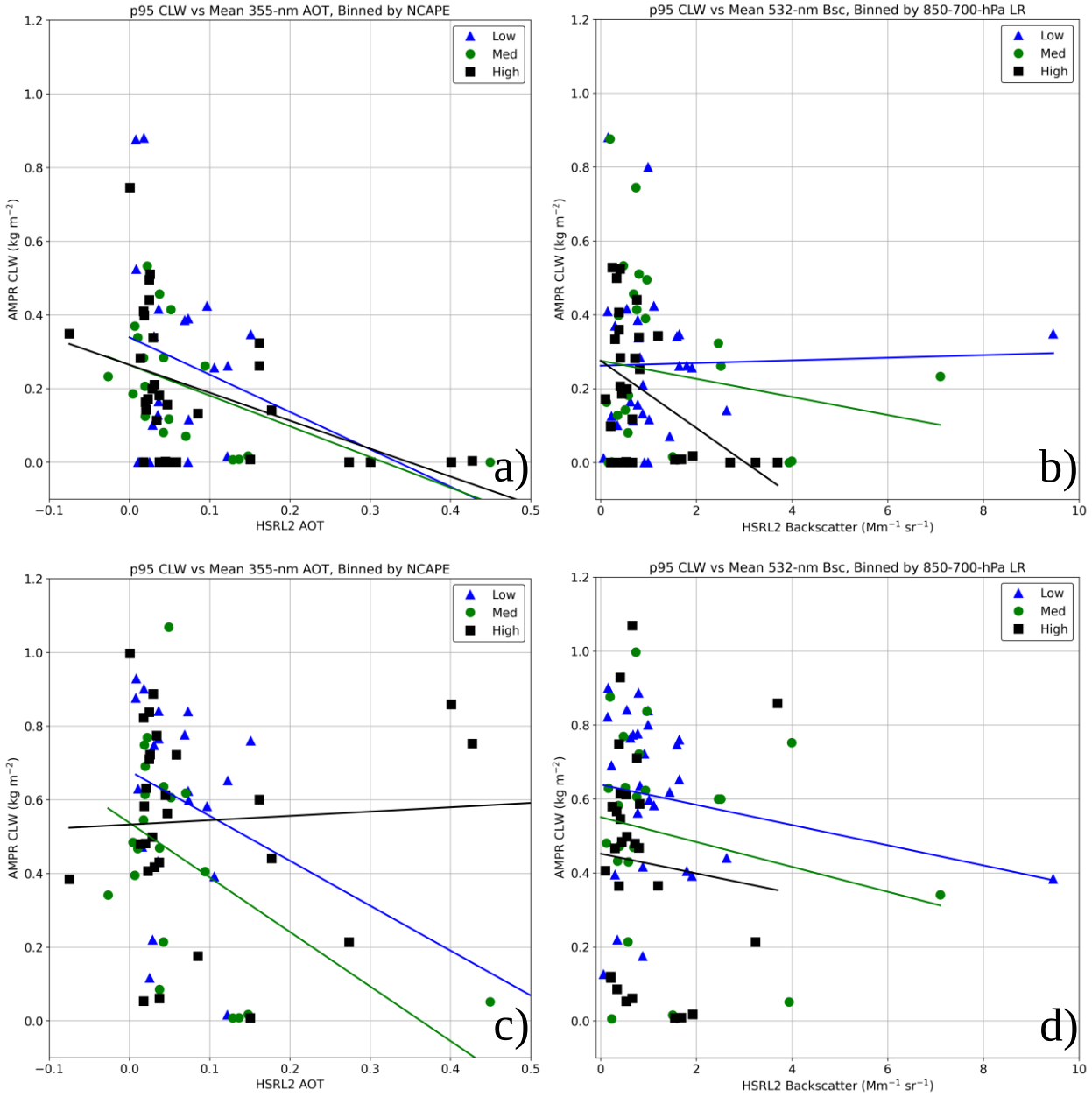

Figure S2: Complete (i.e., non-bootstrapped) scatterplots of p95 AMPR CLW compared with mean values of the HSRL2 parameter listed in the title and x-axis of each plot within environmental bins stratified using the AVAPS parameter listed in the title of the corresponding plot. The top row presents the original masked CLW values, while the bottom row includes an additional mask for CLW < 1 g m^{-2}. AVAPS threshold values were from Test 2 (Table 2 in the main text). In all plots, blue triangles, green circles, and black squares correspond to data points associated with low, medium, and high magnitudes, respectively, of the associated AVAPS parameter. CLW values > 1 kg m^{-2} were masked in Fig. S2a to remove regions with clouds that were potentially precipitating (e.g., Jiang and Zipser, 2006).

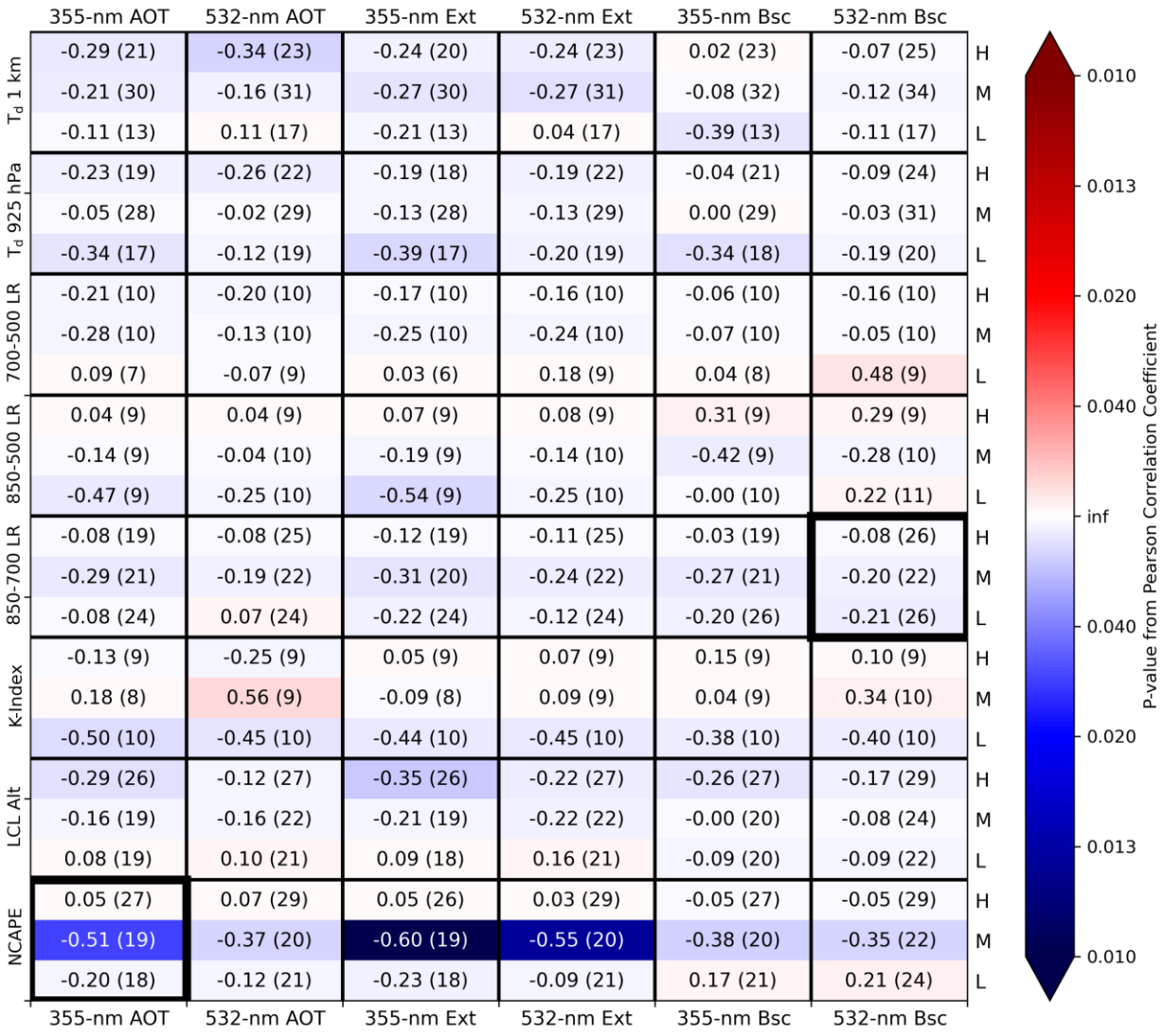

Figure S3: As in Fig. S1 but with additional masking for CLW < 1 g m^{-2} applied. Thicker boxes outline the two correlation sets illustrated in Figs. S2c and S2d.

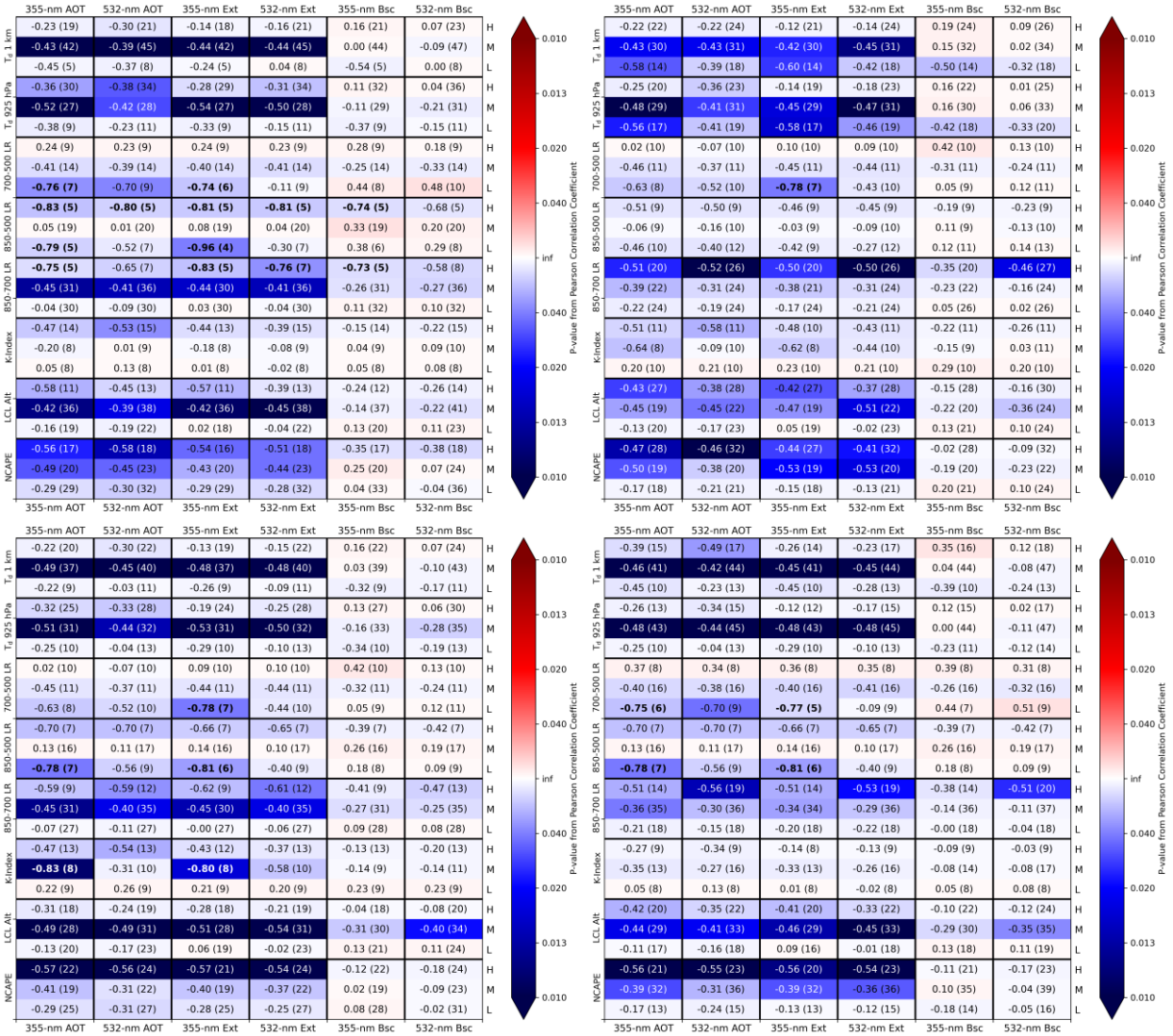

Figure S4: Tables of Pearson correlation coefficients from comparing the 95th percentile (p95) AMPR CLW with mean HSRL2 AOT, extinction (Ext), and backscatter (Bsc) at 355 and 532 nm (top and bottom borders) within environmental bins stratified by the eight AVAPS parameters (left border) at low (L), medium (M), and high (H) magnitudes (right border) across the CAMP^{2}Ex scenes. Within each cell, the listed value is the Pearson correlation coefficient and the parenthesized value indicates the mean number of data points used in the (bootstrapped) comparison. Cells with a Pearson correlation coefficient ≥ 0.70 contain bolded text. Reds (blues) represent positive (negative) Pearson correlation coefficients, and the color shading corresponds to the magnitude of the p-value according to the colorbar, with darker shades of each color associated with lower p-values (i.e., greater statistical significance). Color shading begins to increase substantially around a p-value of 0.05 and reaches a maximum for p-values around 0.01. The four different tables result from the four sensitivity tests detailed in Table 2 (main text), with Test 1 (upper left), Test 2 (upper right), Test 3 (lower left), and Test 4 (lower right) presented herein.

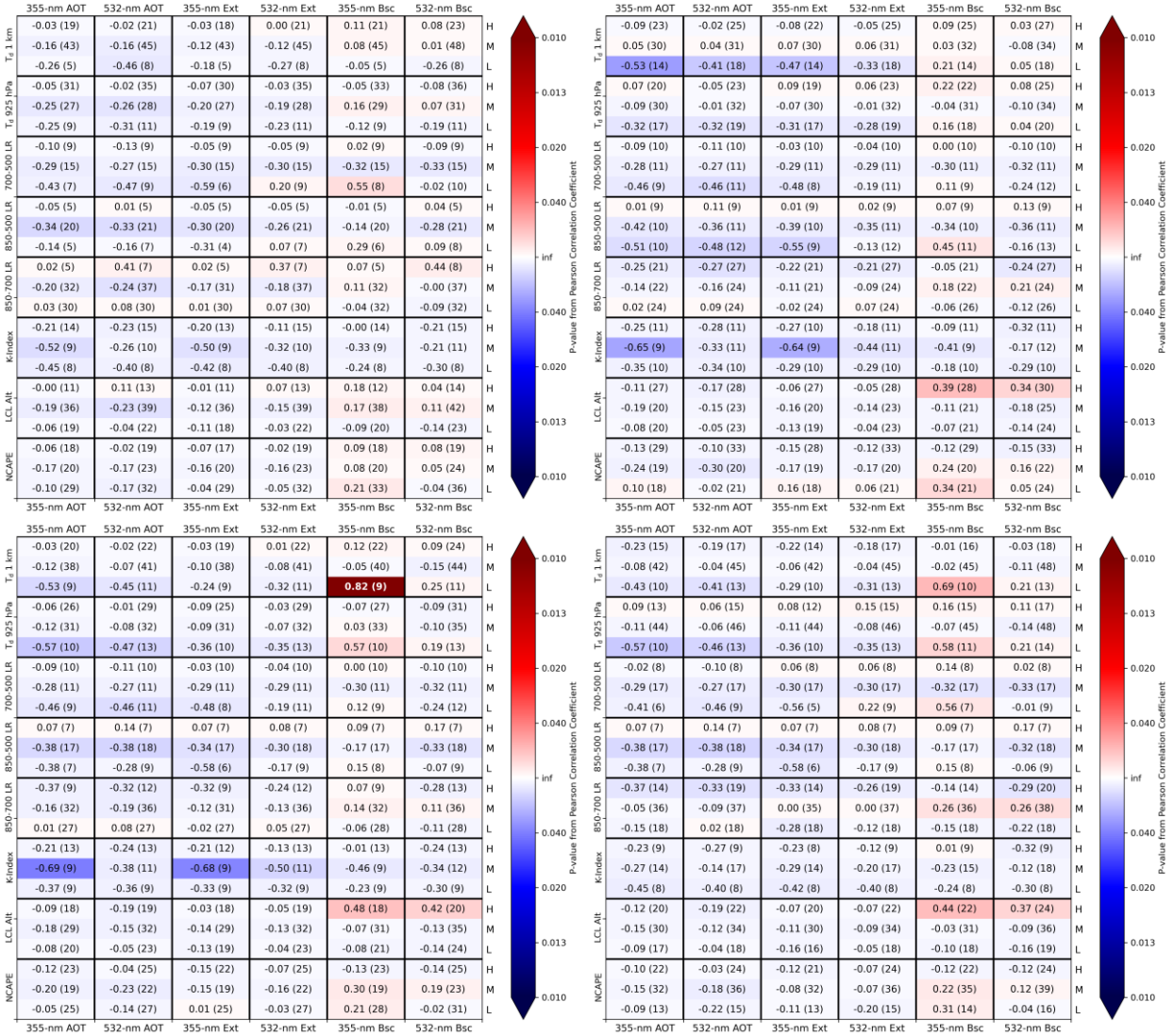

Figure S5: As in Fig. S4 but using p95 AMPR 10.7-GHz polarization-corrected temperature (PCT) as the convective parameter.

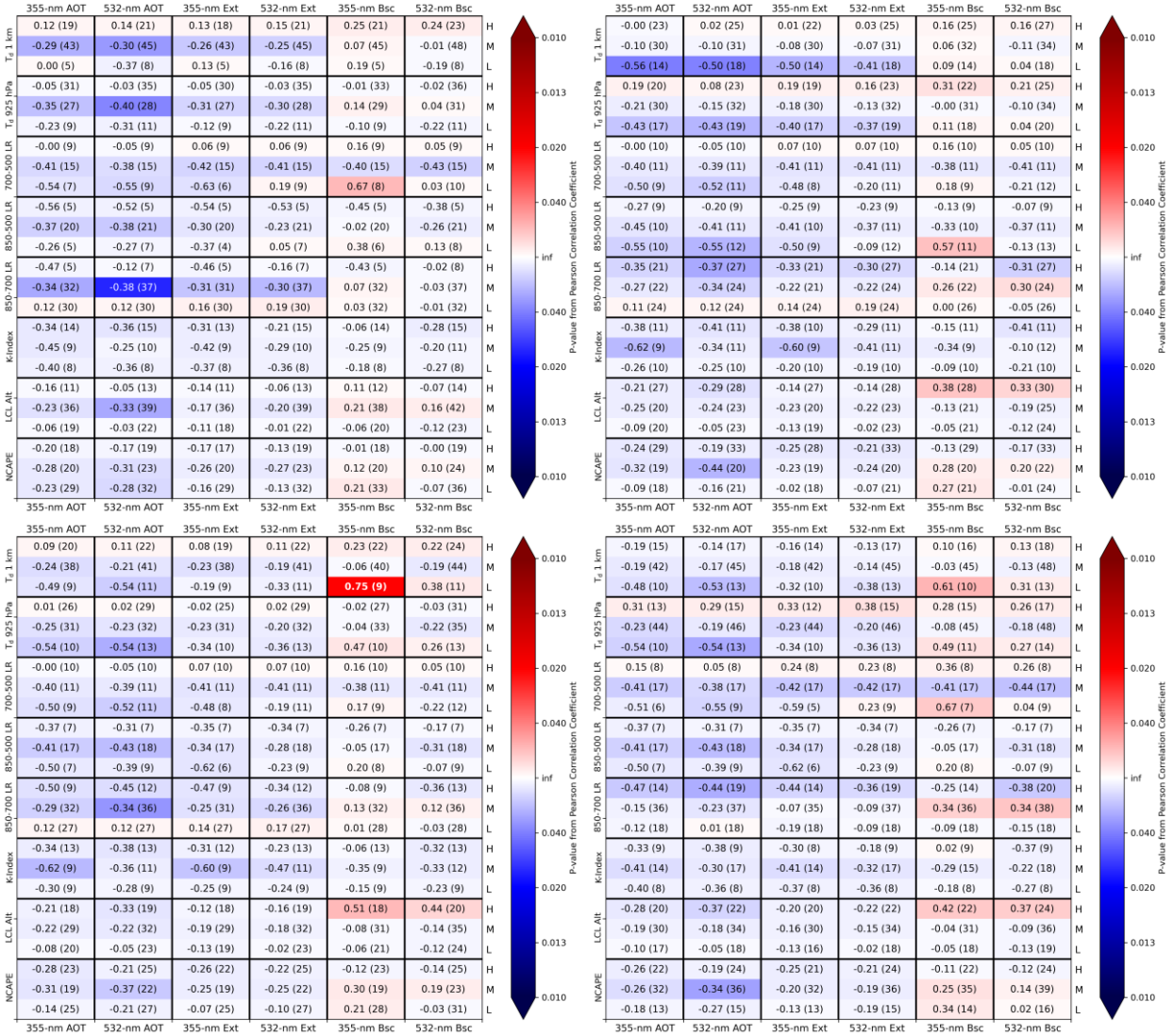

Figure S6: As in Fig. S4 but using p95 AMPR 19.35-GHz PCT as the convective parameter.

Figure S7: As in Fig. S4 but using p95 AMPR 37.1-GHz PCT as the convective parameter.

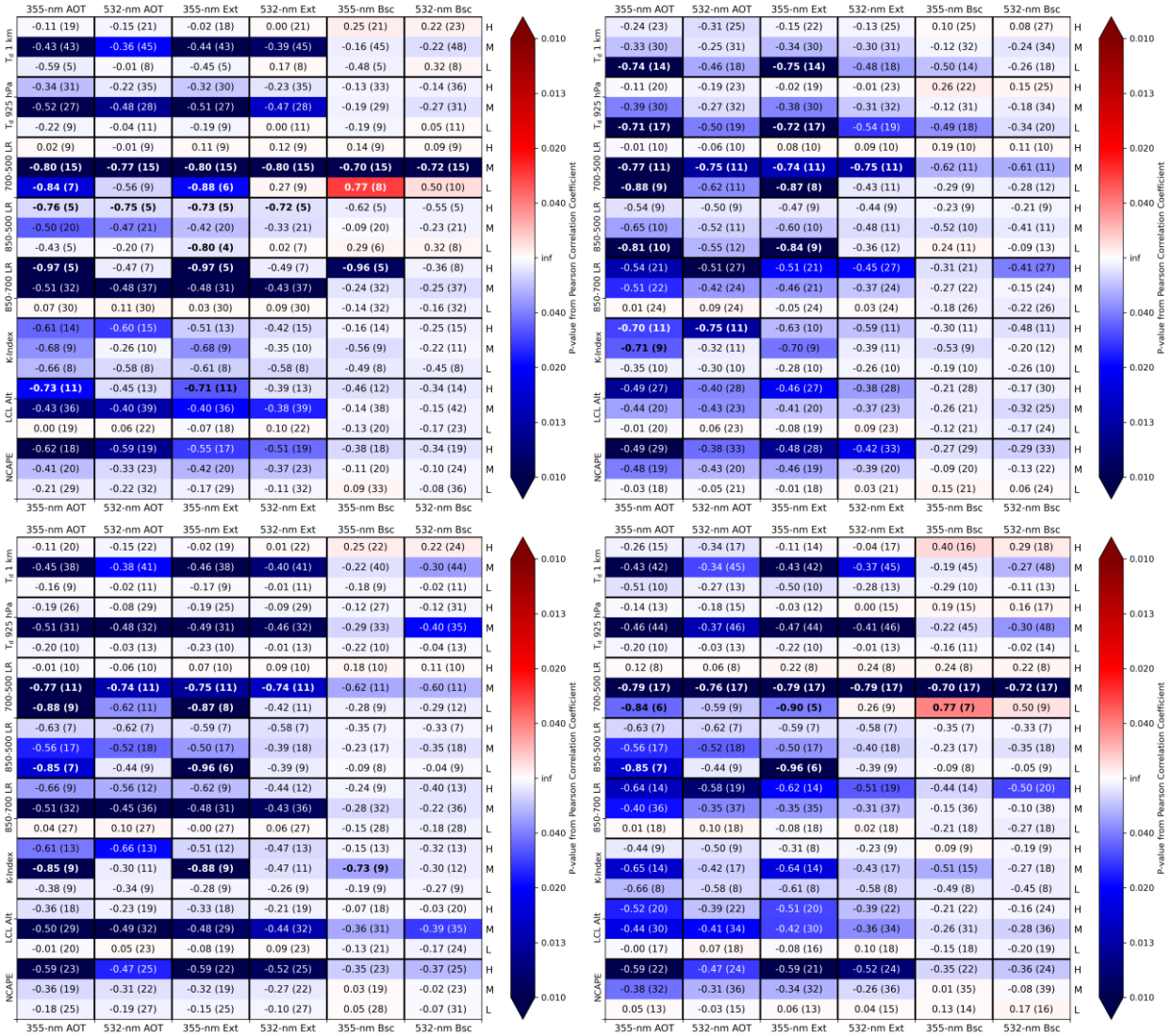

Figure S8: As in Fig. S4 but using p95 AMPR 85.5-GHz PCT as the convective parameter.

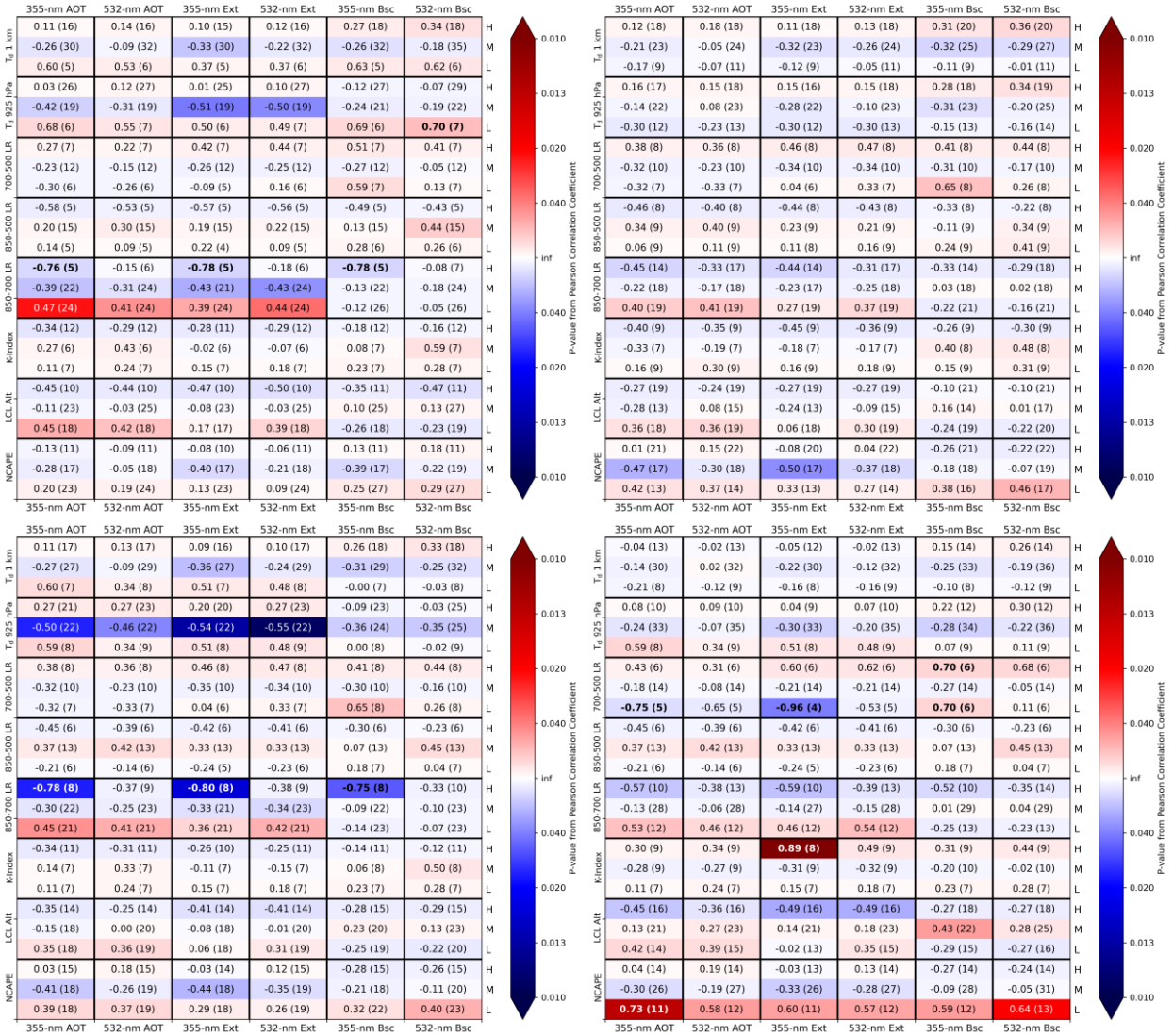

Figure S9: As in Fig. S4 but using p95 APR-3 Ku-band composite Z_H as the convective parameter.

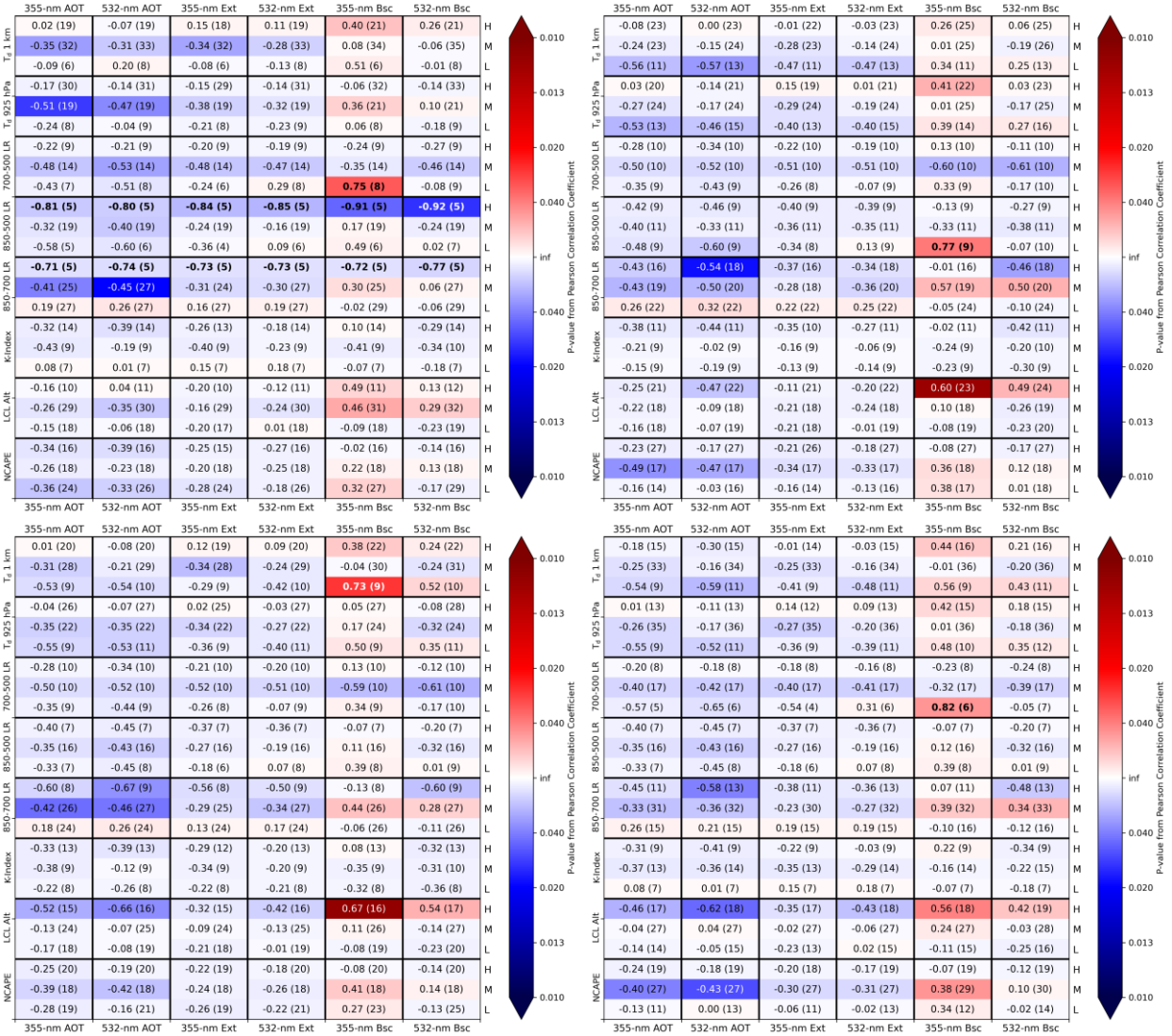

Figure S10: As in Fig. S4 but using the number of APR-3 Ku-band composite Z_H pixels ≥ 30 dBZ within a given scene as the convective parameter.

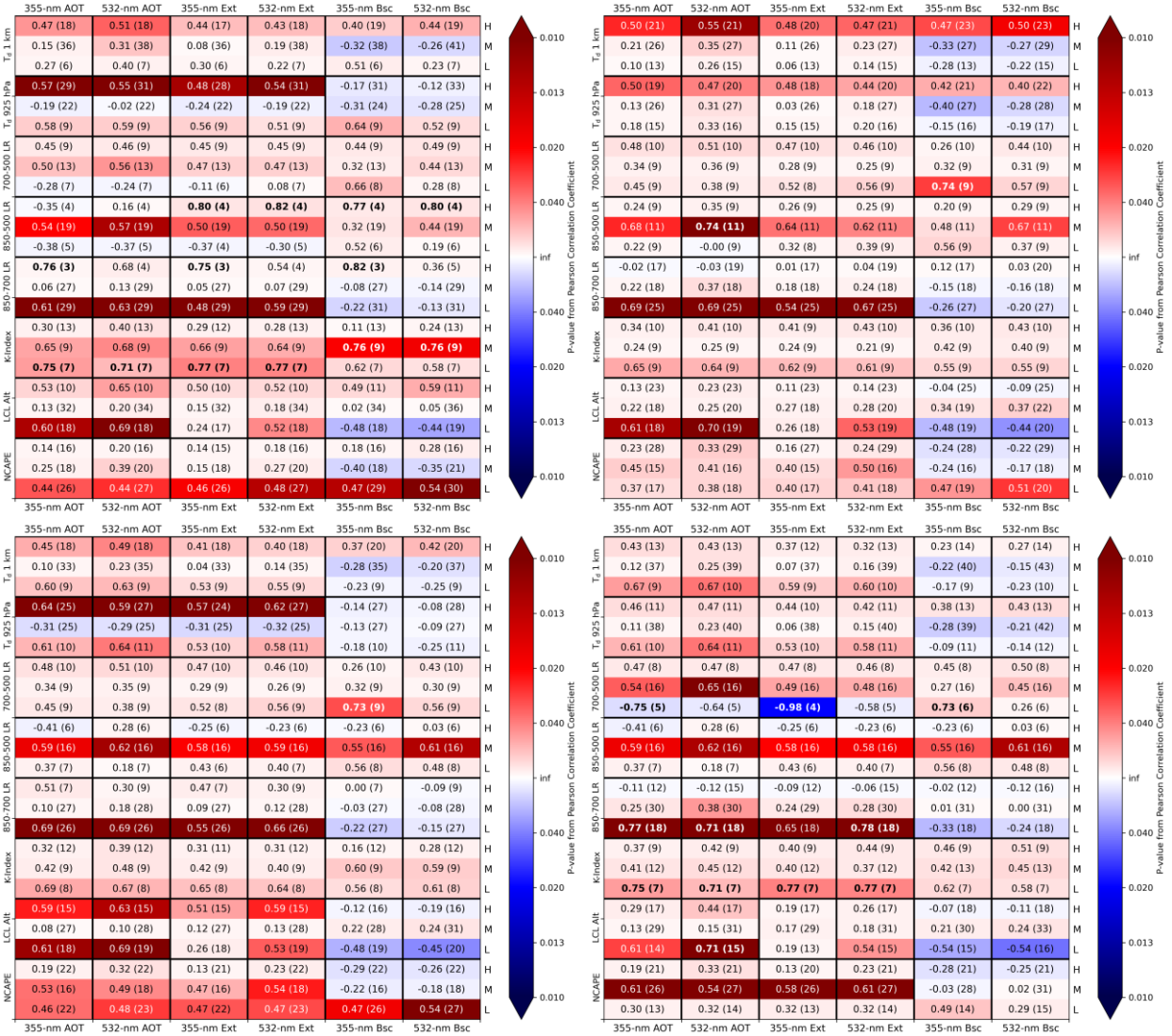

Figure S11: As in Fig. S4 but using p95 APR-3 Ku-/Ka-band dual-frequency ratio (DFR) as the convective parameter.