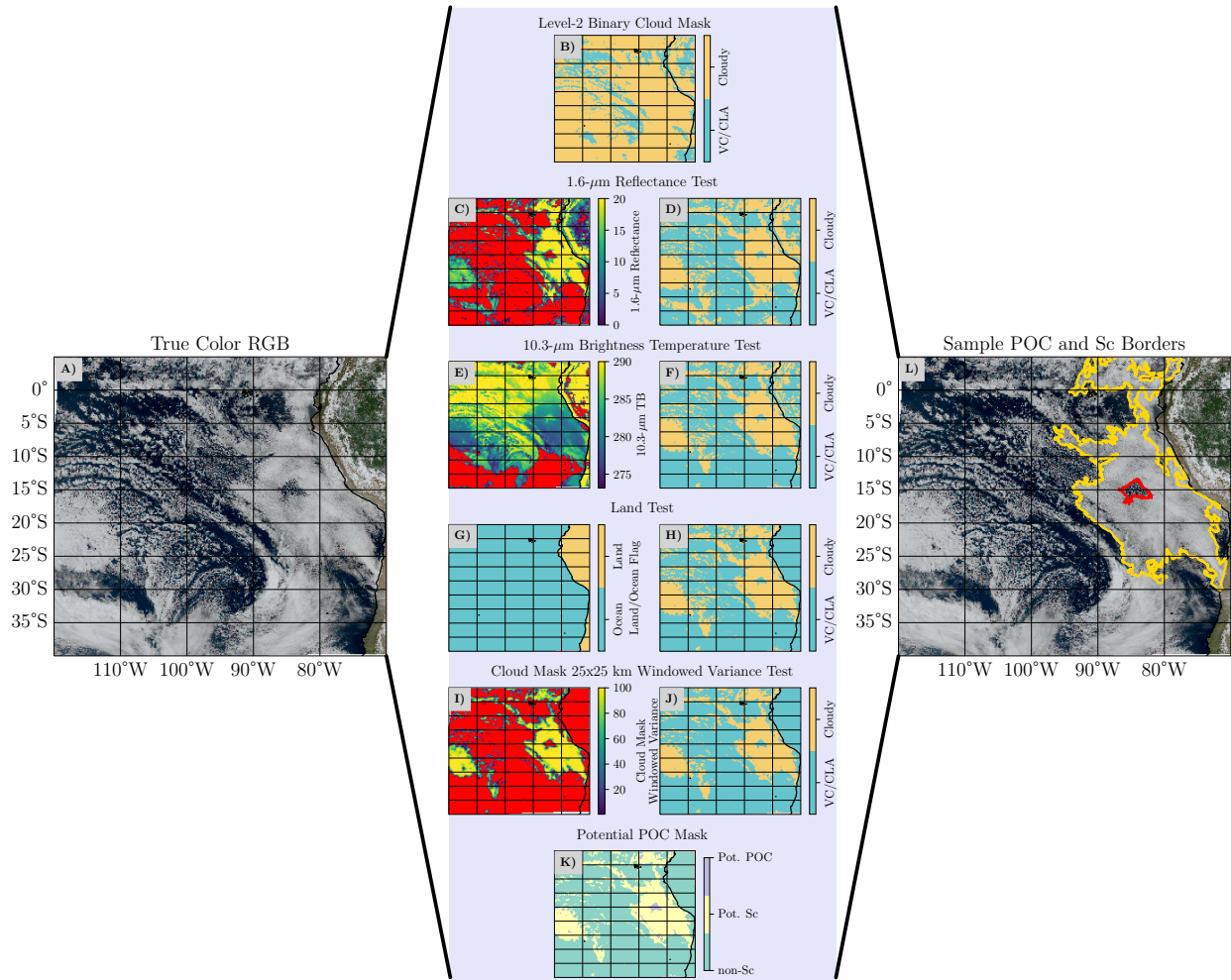


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2 Figure 1: Flowchart of how POCs are identified.

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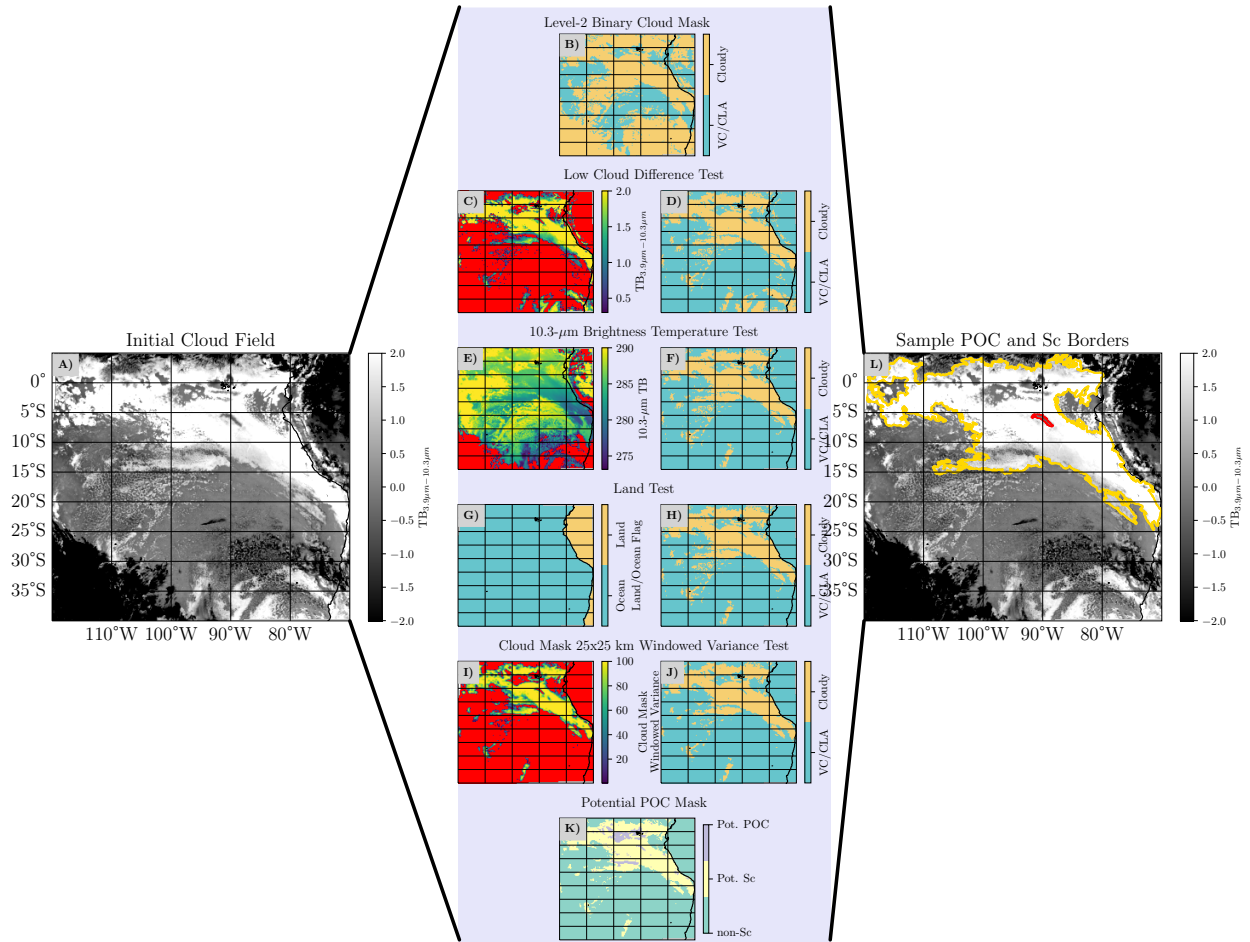
Daytime POC Identification



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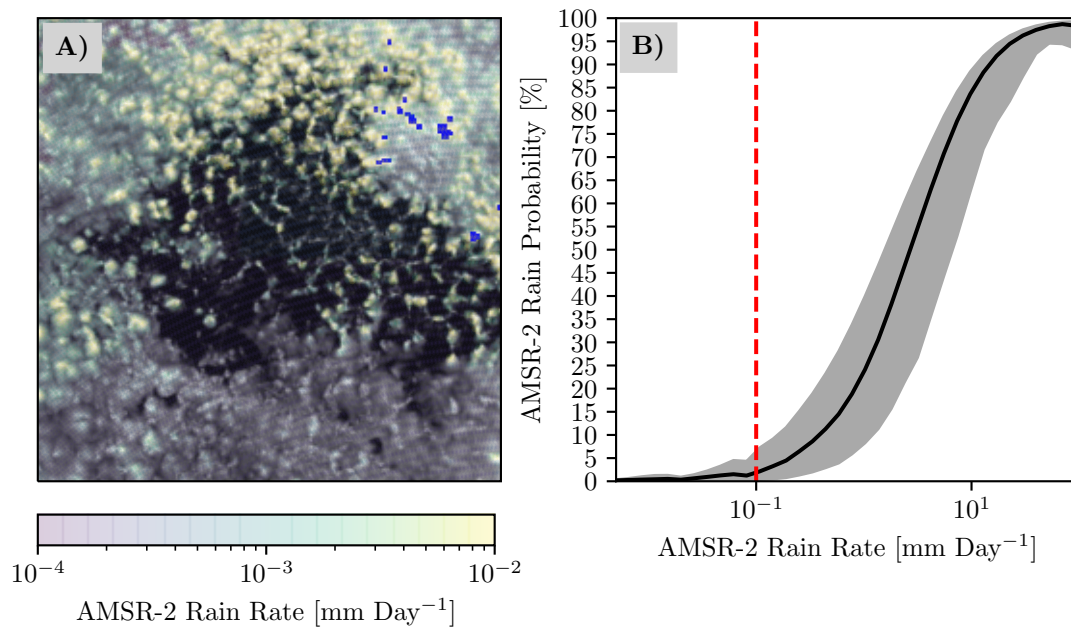
Figure 2: Daytime POC Identification Steps. In the third column, the stratocumulus deck borders are in yellow and POC borders are in red.

Nighttime POC Identification



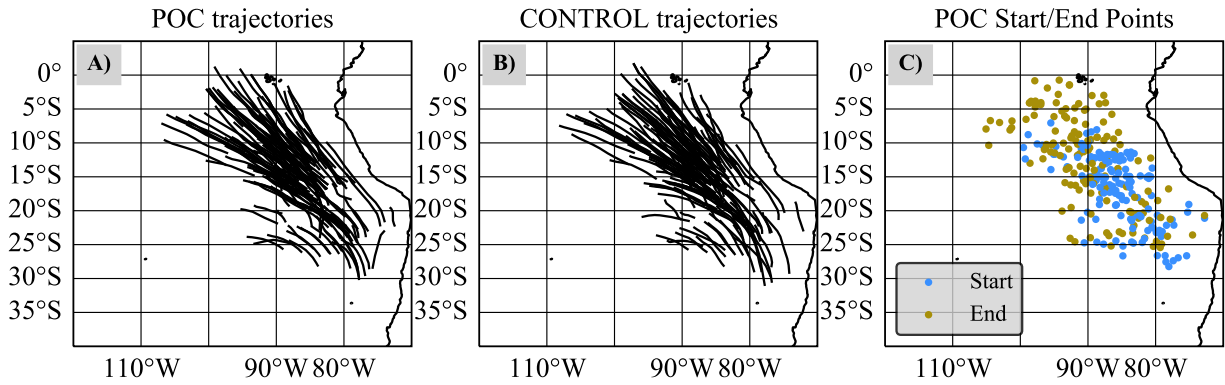
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Figure 3: Nighttime POC Identification Steps. In the third column, the stratocumulus deck borders are in yellow and POC borders are in red.



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 14 *Figure 4: AMSR-2 rain rates matched to the POC shown in Figure 2 overlaid on GOES-16 0.64-μm reflectance are shown in panel*
 15 *A). AMSR-2 rain probability as a function of rain rate for all September-November 2019 data over the entire domain are shown*
 16 *in panel B), where the solid black line represents the median probability at a given rain rate, grey fill represents the 10th-90th*
 17 *percentile spread at a given rain rate, and the dashed red line represents the rain rate threshold of 0.1 mm day⁻¹.*

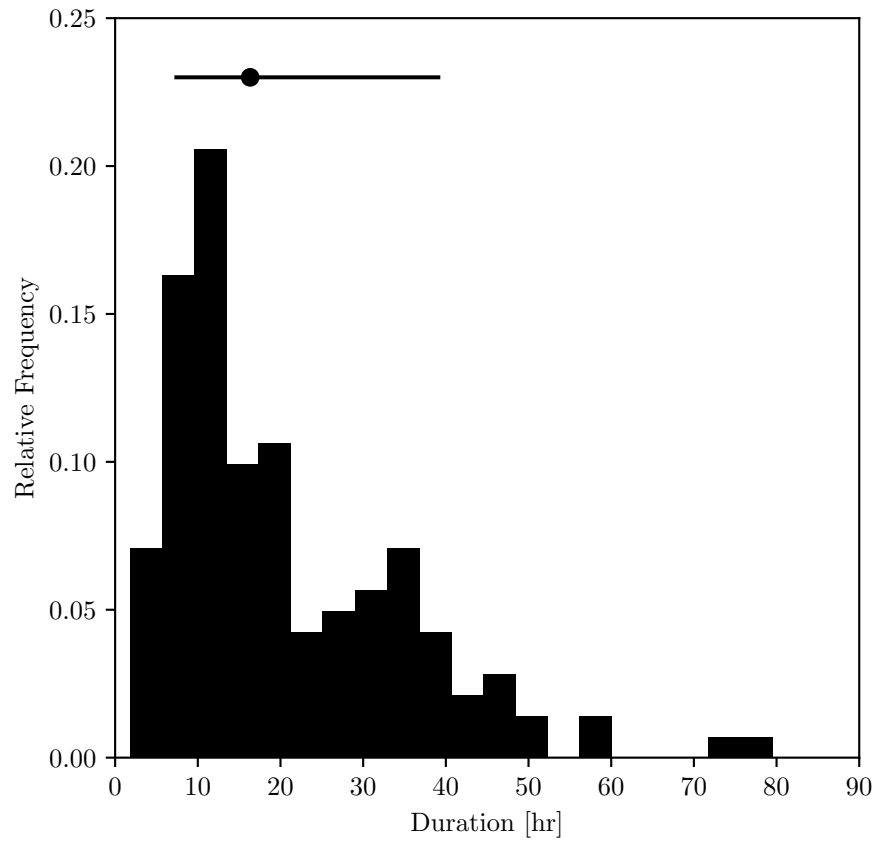
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Figure 5: MERRA-2 trajectories that traverse closed-cell stratocumulus and develop into pockets of open cells are shown in panel A), the MERRA trajectories that traverse through closed-cell stratocumulus and never develop into pockets of open cells are shown in panel B), and POC starting and ending points are shown in Panels C).

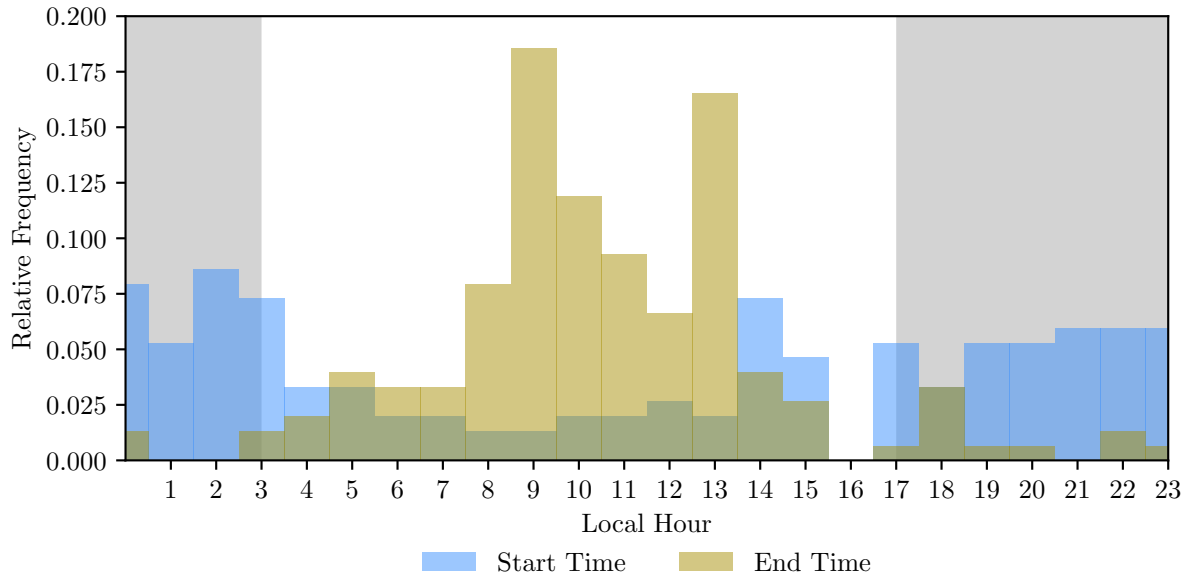
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25 *Figure 6: Histogram of POC duration. The black dot above the histogram represents the median and the horizontal black line*
 26 *represents the 10th to 90th percentile spread.*

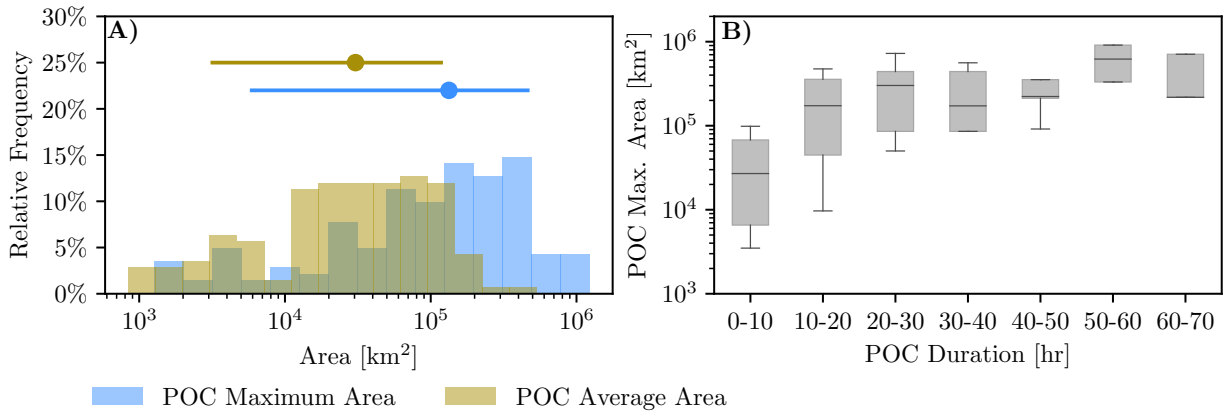
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29 *Figure 7: Histograms of POC start time (blue) and end time (brown).*

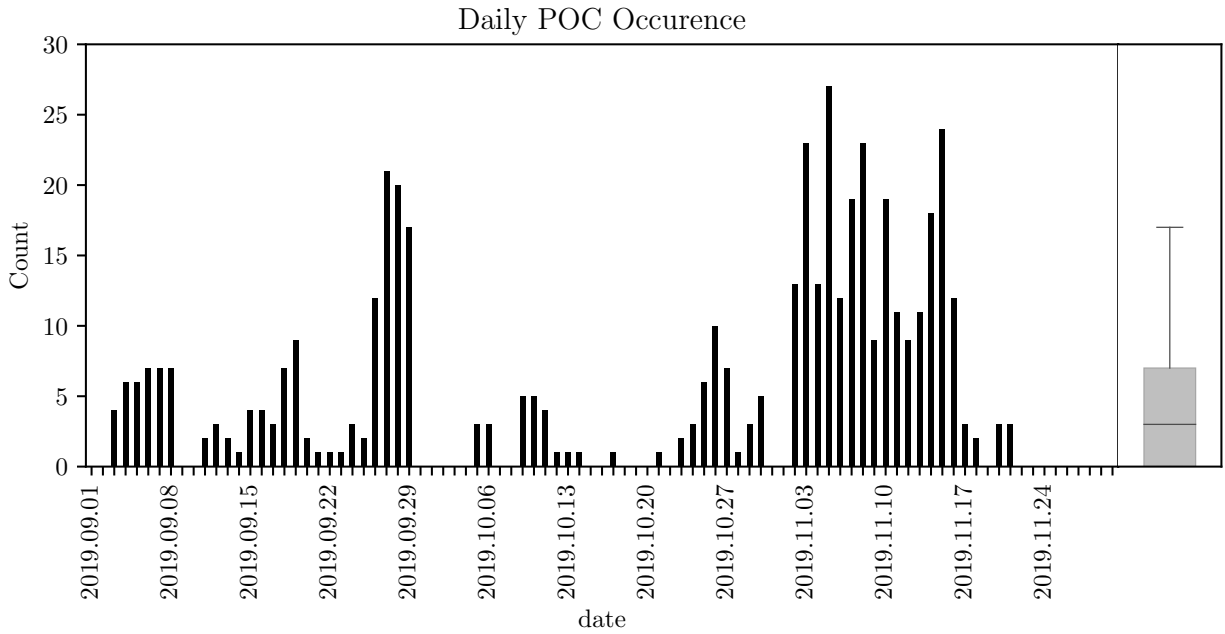
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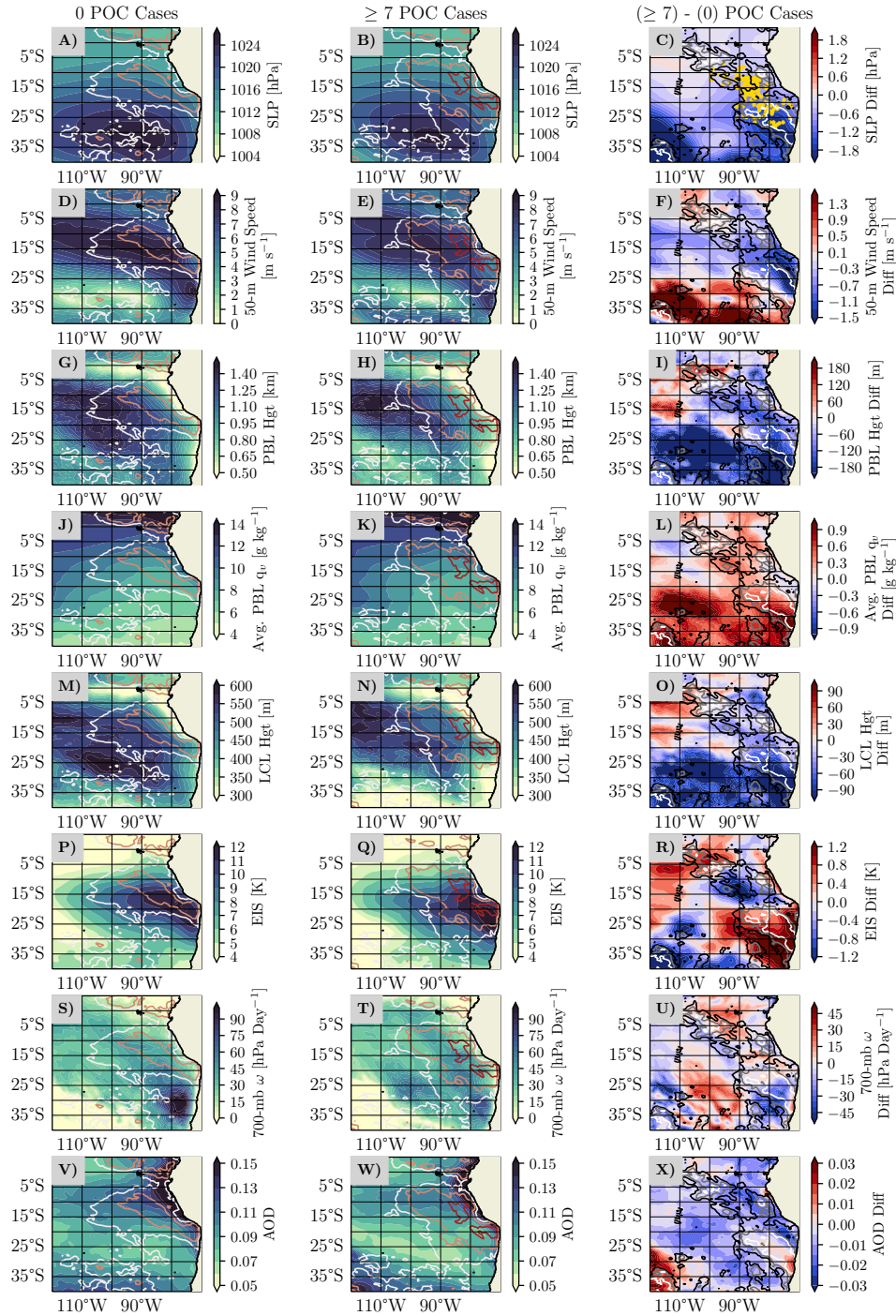
Figure 8: Histograms of POC maximum (blue) and average (brown) area are shown in panel A). The distribution of POC area as a function of POC duration is shown as box plots in panel B), where the solid line represents the median duration, the shaded box represents the interquartile range, and the whiskers represent data between the 10th and 90th percentiles.

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 37 *Figure 9: The number of POCs occurring on each day is shown. The boxplot represents the overall distribution of daily POC*
 38 *occurrence, where the solid line represents the median duration, the shaded box represents the interquartile range, and the*
 39 *whiskers represent data between the 10th and 90th percentiles.*

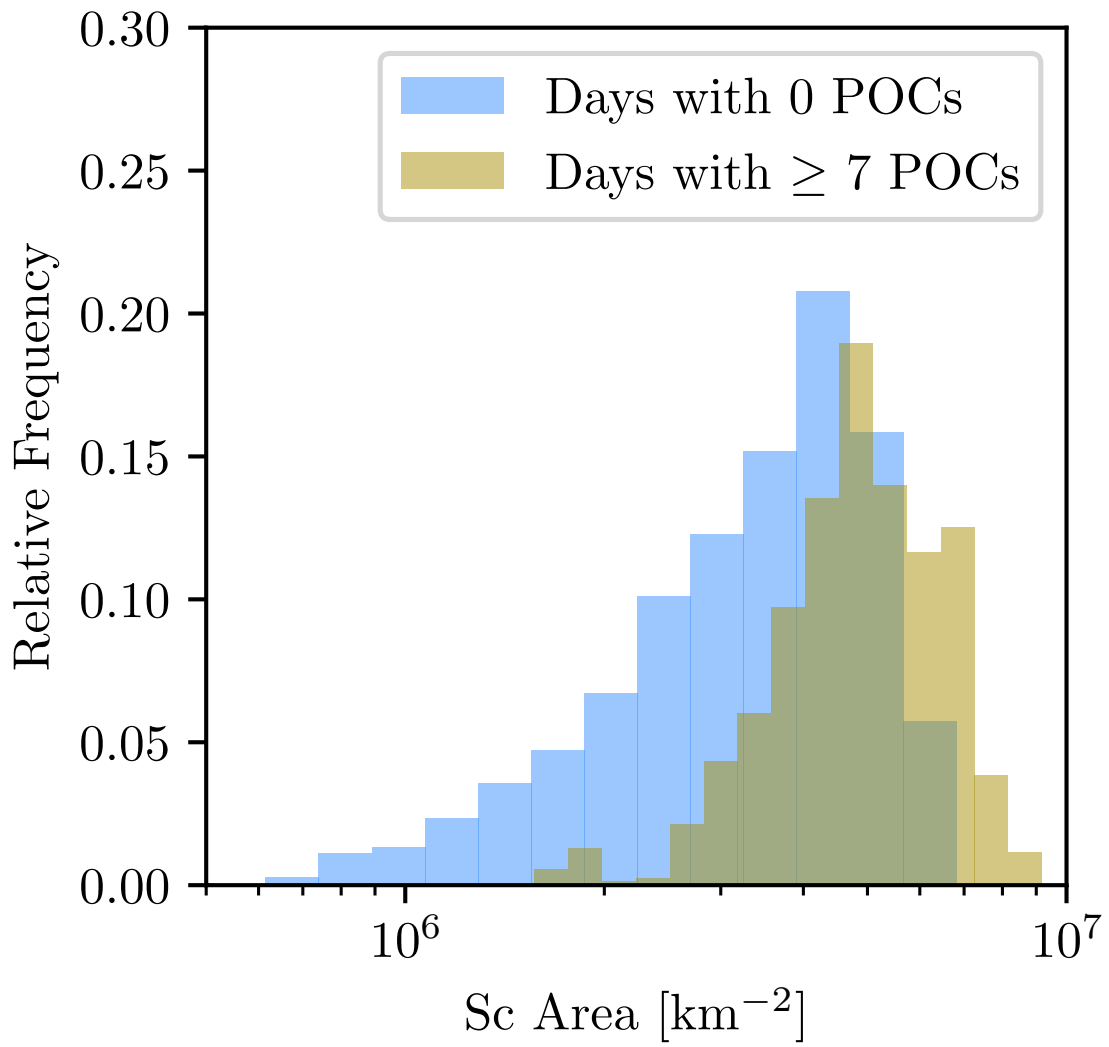
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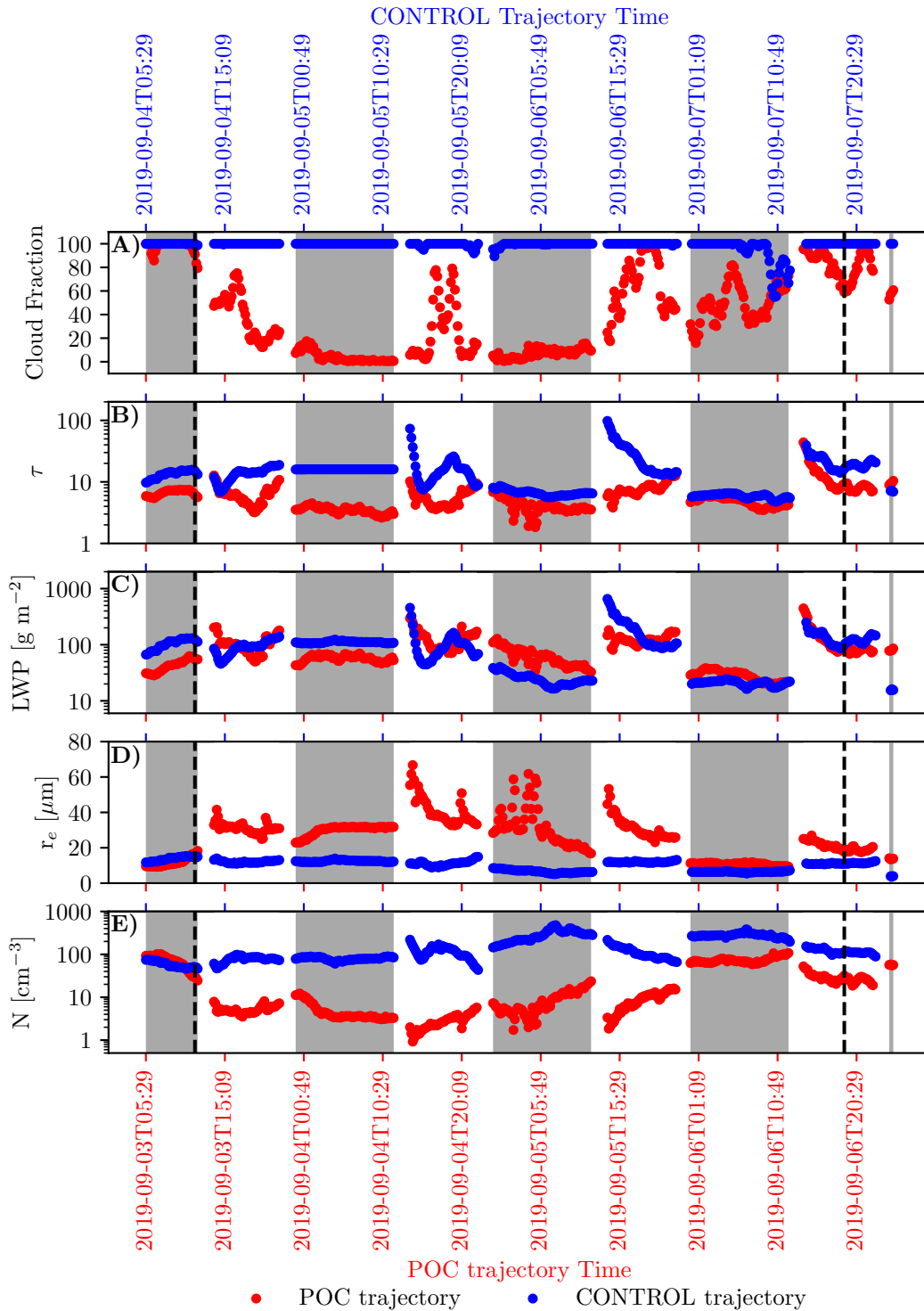
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43 Figure 10: Average sea-level pressure (SLP; panel A), 50-m winds (panel D), planetary-boundary layer (PBL) height (panel G),
 44 average PBL water vapor mixing ratio (q_v ; panel J), lifted-condensation level (LCL; panel M), estimated-inversion strength (EIS;
 45 panel P), 700-mb omega (ω ; panel S), and total-column aerosol-optical depth (AOD; panel V) are shown in the first column for
 46 days when no POCs occur. The second column shows the same variables for days when > 7 POCs occur. The third panel shows
 47 the difference between each variable for days with > 7 POCs and days with no POCs. The non-filled contours overlaid in all
 48 panels represent cloud fraction, where white represents 70%, orange represents 80%, and red represents 90%. The gold dots
 49 shown in panel C) overlay POC starting point.



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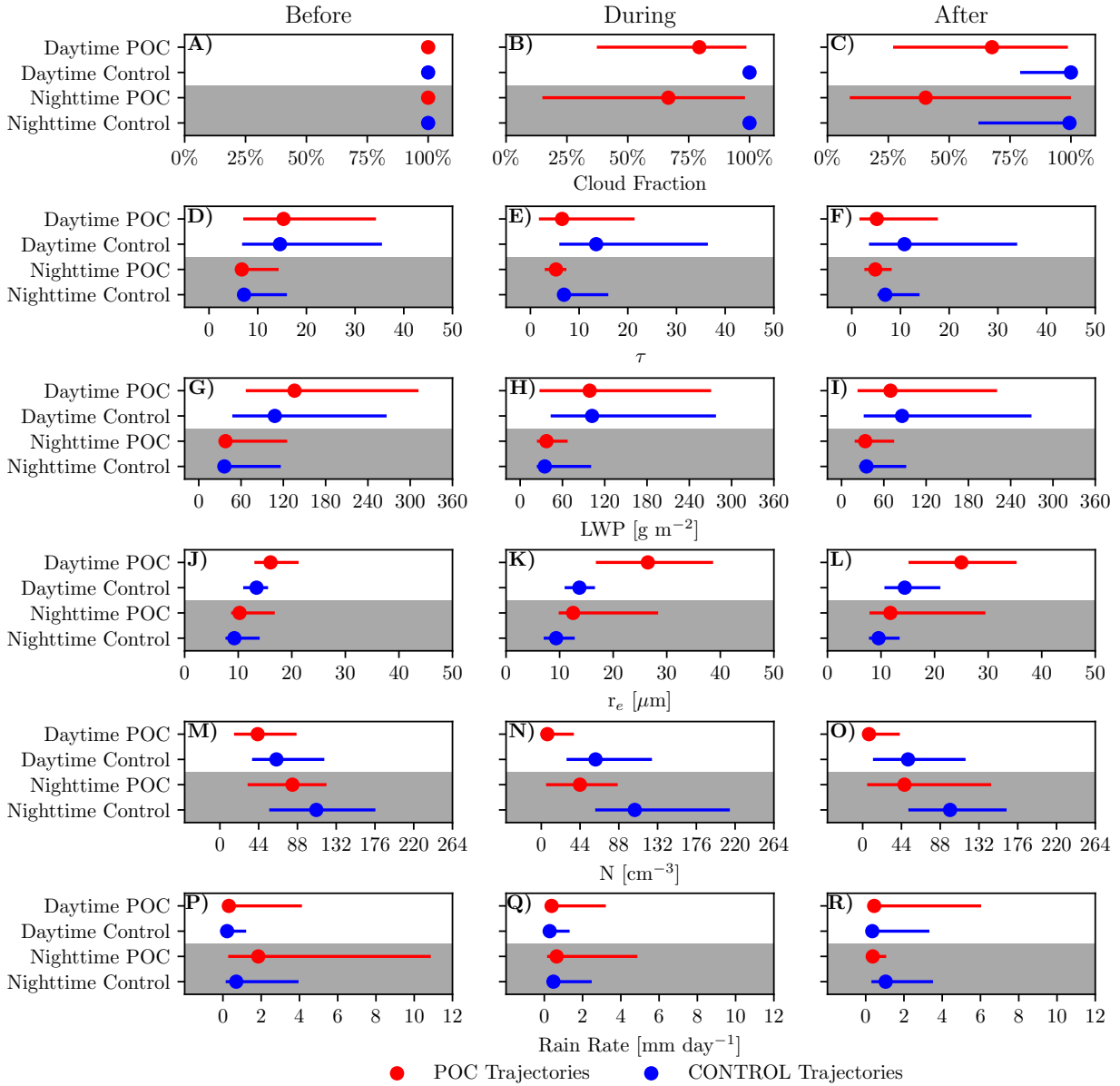
Figure 11: Distributions of stratocumulus area for days with no POCs (blue) and days with > 7 POCs (brown) are shown above.



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54 Figure 12: Changes in cloud fraction (panel A), cloud optical depth (panel B), liquid water path (panel C), effective radius (panel
 55 D), and cloud drop number concentration (panel E) are shown along the trajectory for a sample POC case that occurred between
 56 09/03/2019 and 09/07/2019. The purple dots correspond to the sample POC trajectory, while the green dots correspond to the
 57 corresponding CONTROL trajectory. Gray shading indicates night time periods.

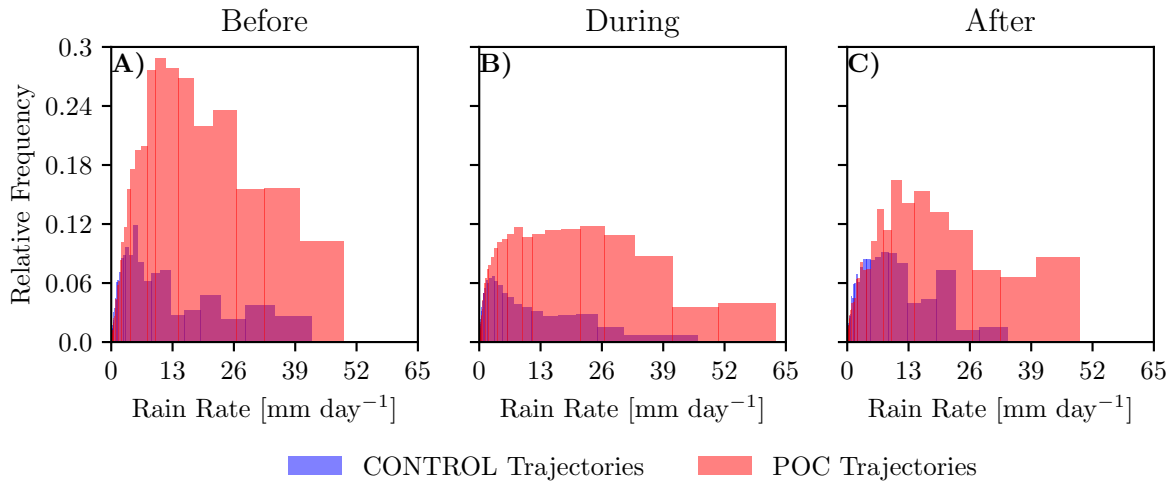
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60 *Figure 13: Daytime statistics for cloud fraction (A, B, and C), cloud-optical depth (D, E, and f),*
 61 *cloud-top effective radius (J, K, and L), cloud-drop number concentration (M, N, and O), and AMSR-2 rain rate (P, Q, and R)*
 62 *are shown in the upper-white half of each panel, while the nighttime statistics are shown in the grey-lower half of each panel. Red*
 63 *values represent the POC trajectories, while the blue values represent the CONTROL trajectories. The colored dots represent the*
 64 *median of each distribution, and the horizontal lines represent the spread between the 10th and 90th percentiles.*

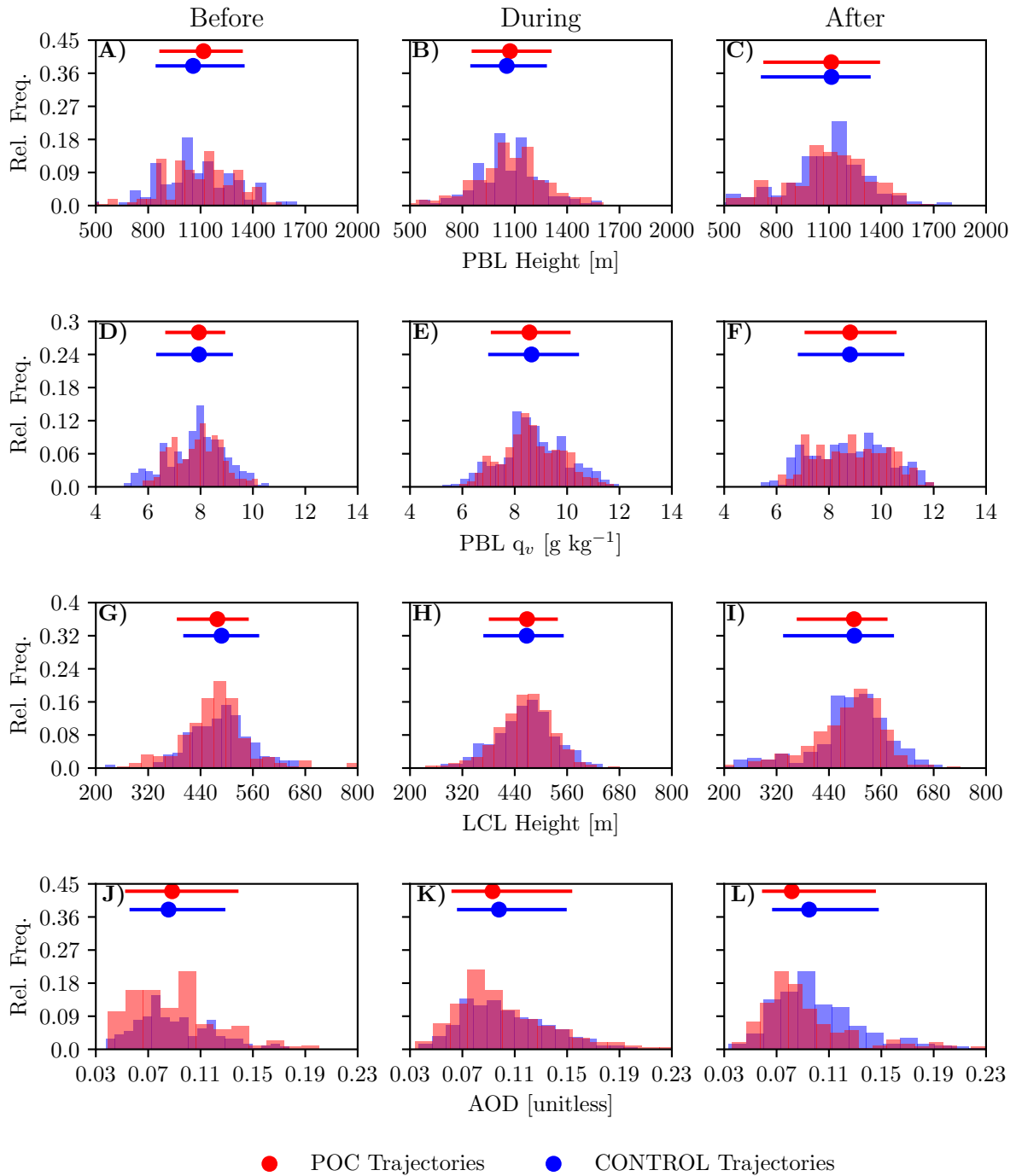
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67 *Figure 14: Histograms of rain rate along the POC (red) and CONTROL (blue) trajectories before (A), during (B), and after (C) POC*
 68 *lifetime are shown, where each bin is multiplied by bin-center rain rate (e.g. accumulation weighted) and the area under each*
 69 *curve is normalized to mean rain rate for each distribution.*

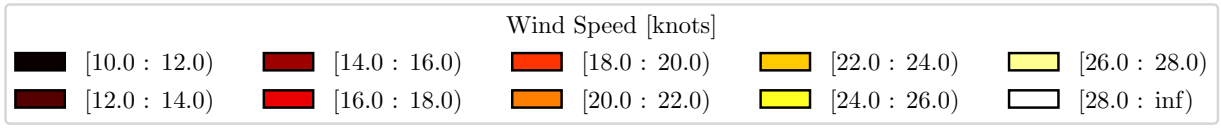
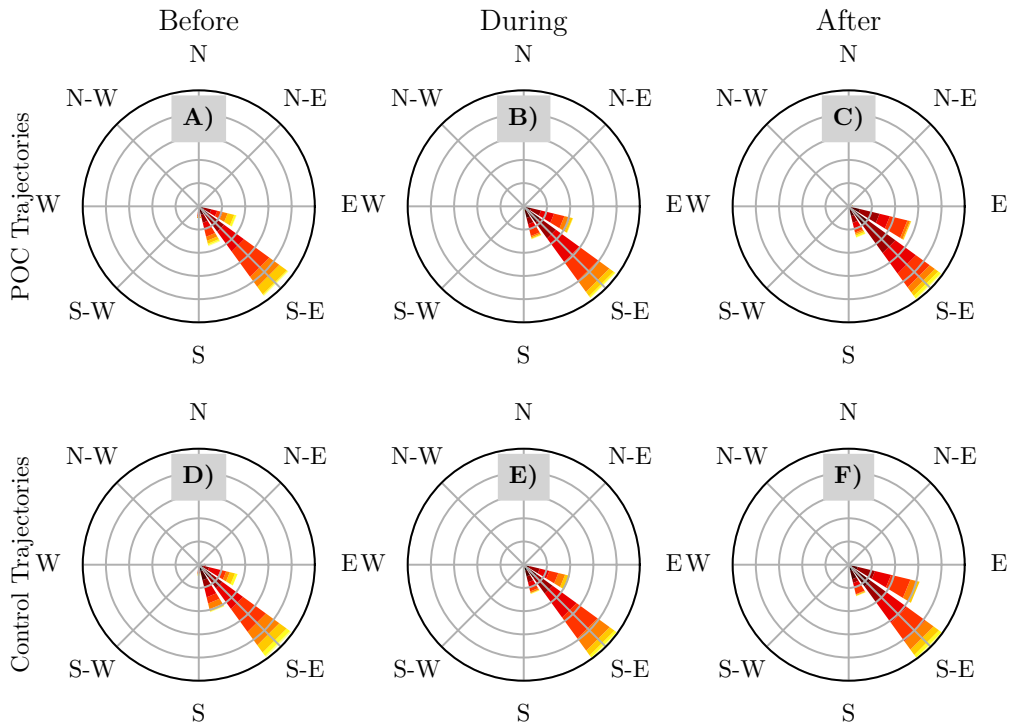
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72 *Figure 15: Distributions of environmental properties before a POC forms (left column), during POC lifetime (middle), and after*
 73 *POC dissipation (right). Top row (A, B, and C) shows planetary boundary layer (PBL) height. PBL-average water vapor mixing*
 74 *ratio q_v is shown in the second row (D, E, and F). Lifted-condensation level height is shown in the third row (G, H, and I). Aerosol*
 75 *optical depth is shown in the fourth row (J, K, and L). Red represents distributions mapped to the POC trajectories, while blue*
 76 *represents the distributions mapped to the CONTROL trajectories. The colored dots represent the median of each distribution,*
 77 *and the horizontal lines represent spread between the 10th and 90th percentiles.*

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80 *Figure 16: Wind rose plots are used to show the most common 925-mb wind speed and direction before a POC (panels A and D),*
 81 *during a POC (panels B and E), and after a POC ends (panels C and F). The wind rose plots in the top row represent the*
 82 *trajectories that intersect a POC, while those in the bottom row represent the trajectories that do not intersect a POC.*

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