

Supplementary material

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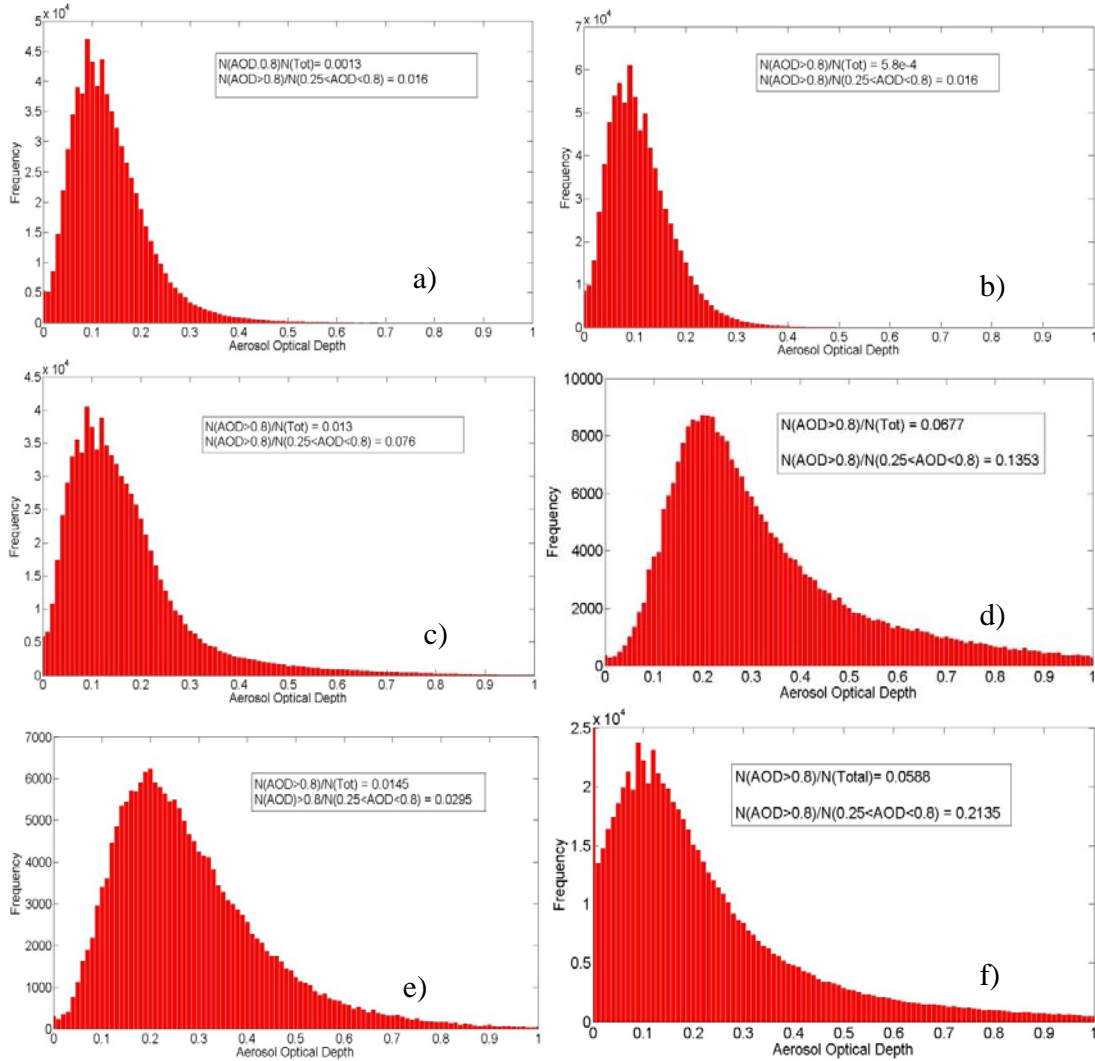


Figure S1. Histograms for AOD distribution for a) CAL, b) PE, c) SAF, d) AS, e) BoB, and f) BLA. Values in legend show the fraction of days with $\text{AOD} > 0.8$ relative to all days, $N(\text{AOD} > 0.8) / N(\text{Tot})$ and heavily polluted days, $N(\text{AOD} > 0.8) / N(0.25 < \text{AOD} < 0.8)$.

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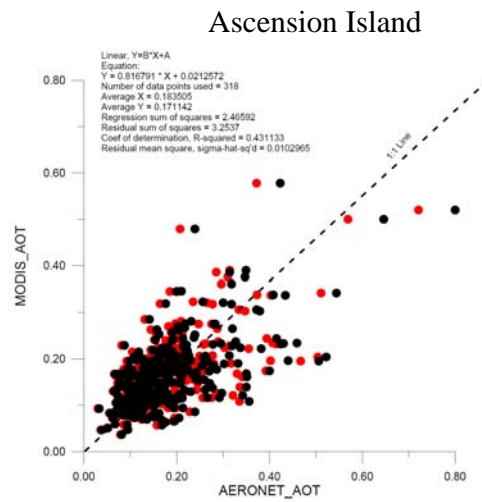
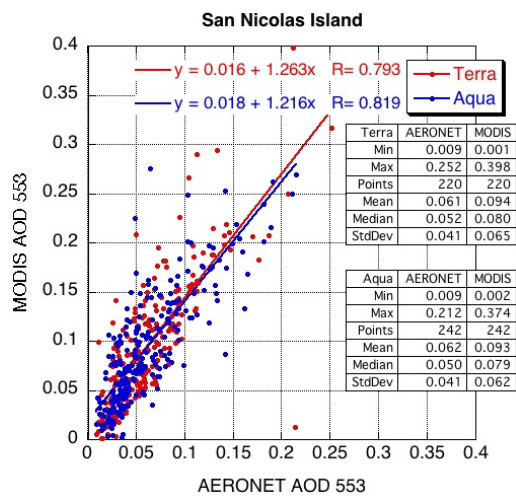
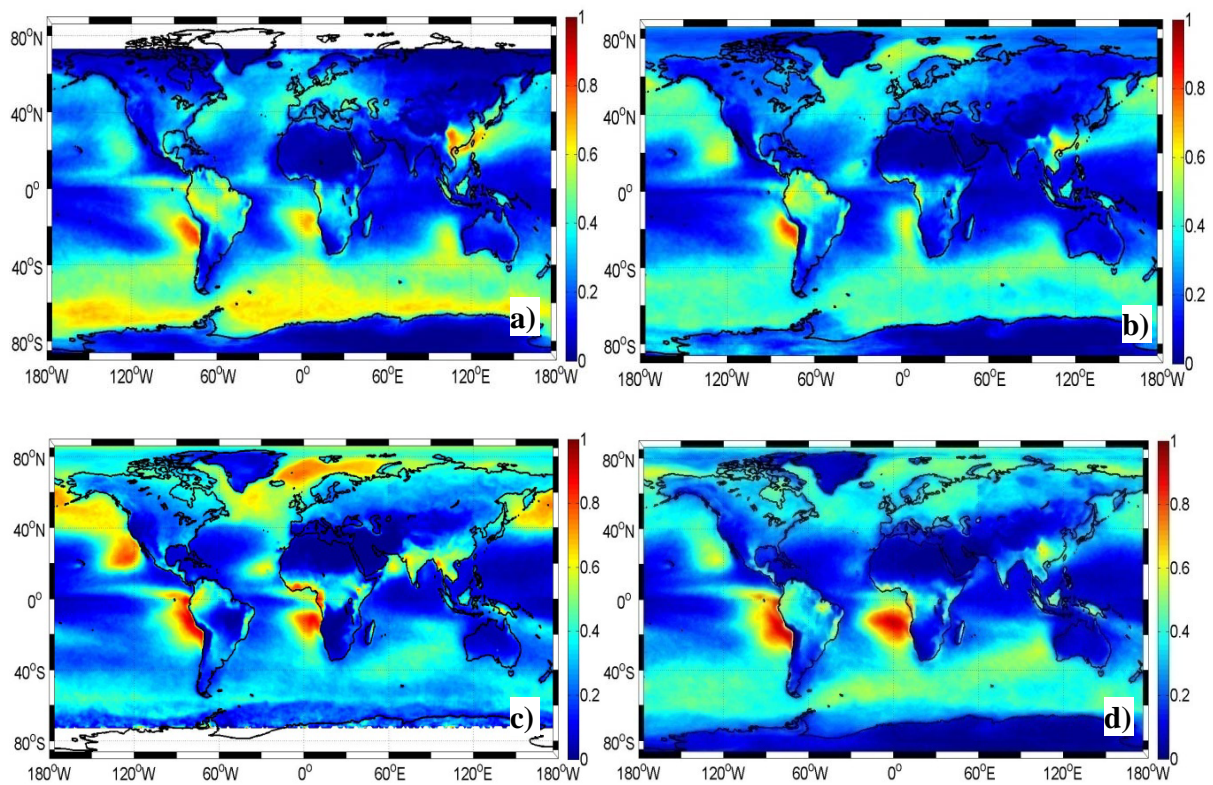
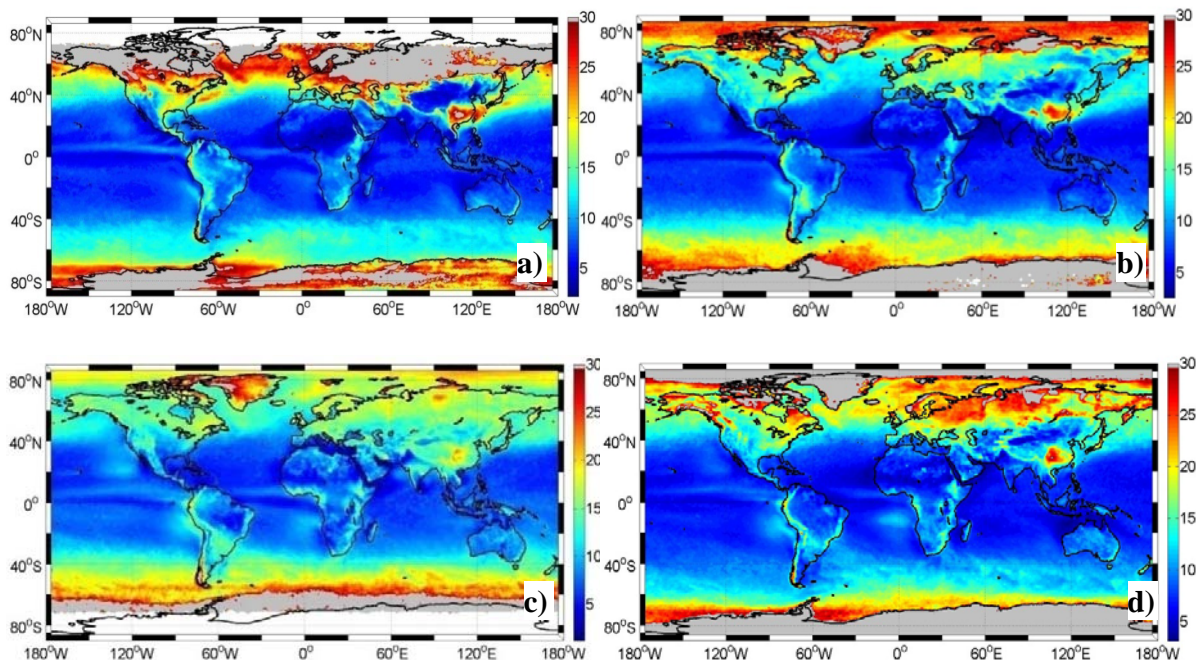


Figure S2. Comparison of co-located MODIS AOD retrievals with automatic Sun/sky
5 radiometers of the AERosol Robotic NETwork (AERONET) at San Nicolas Island (119.487W,
33.257N) and Ascension Island (14.415E, 7.976S) stations.



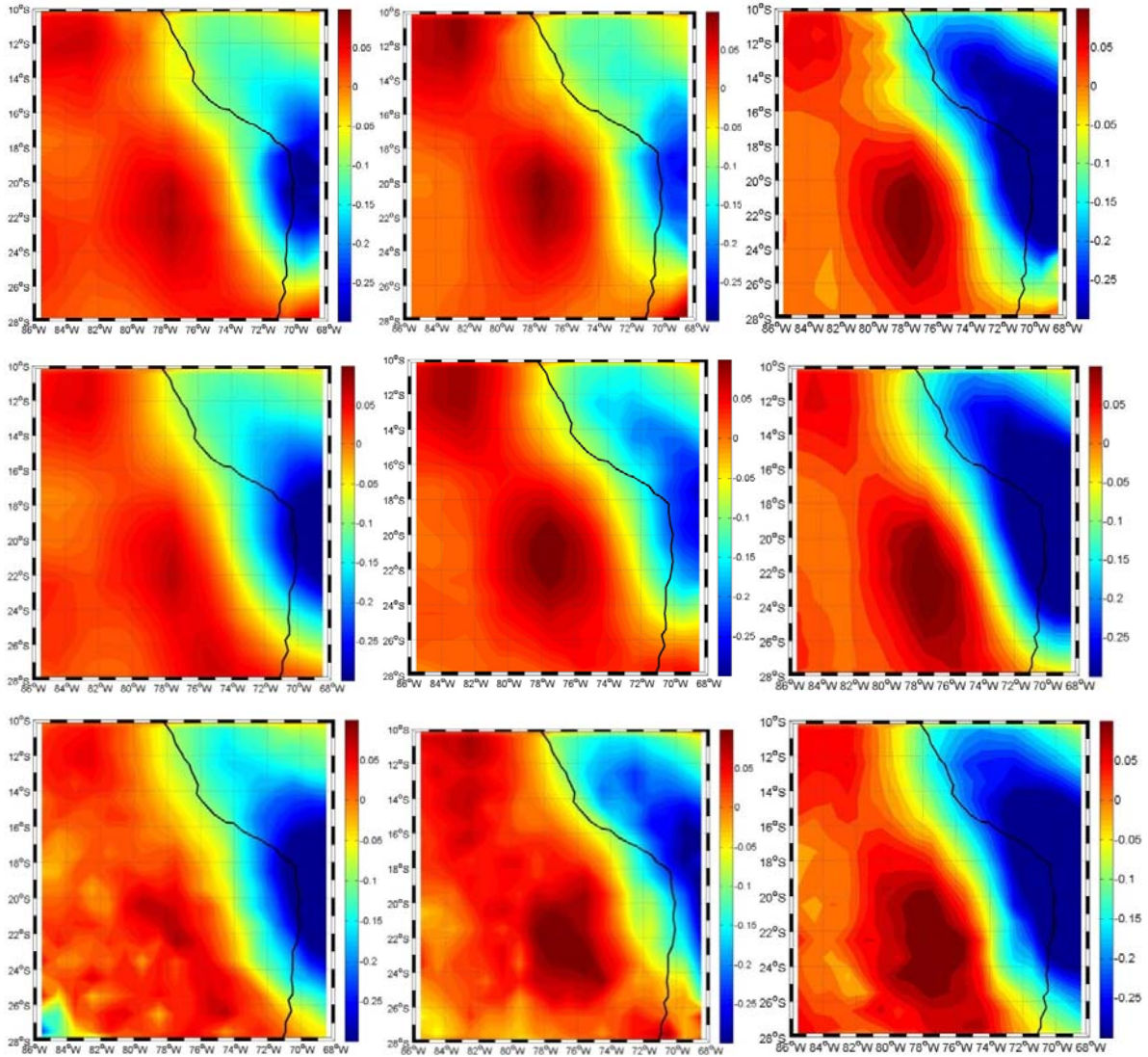
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Figure S3. Global distribution of 7-yr averaged liquid cloud fraction values (from *Terra* satellite) for different seasons: a) December – February; b) March – May; c) June – August; and d) September – November.



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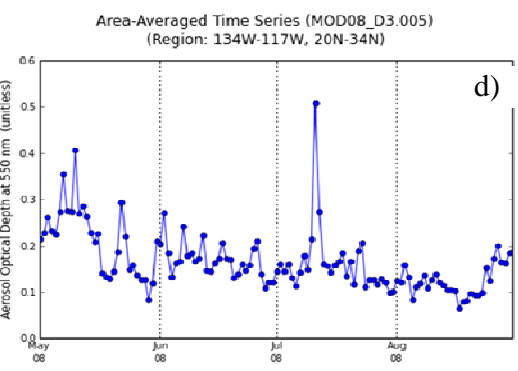
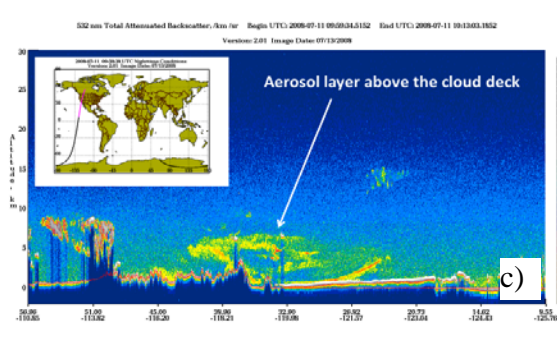
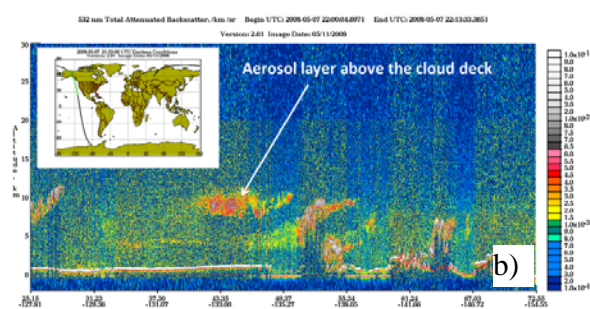
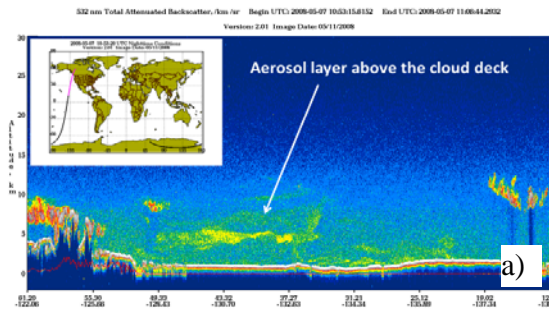
Figure S4. Global distribution of 7-yr averaged liquid cloud optical thickness values (from *Terra* satellite) for different seasons: a) December –February; b) March – May; c) June – August; and d) September – November.



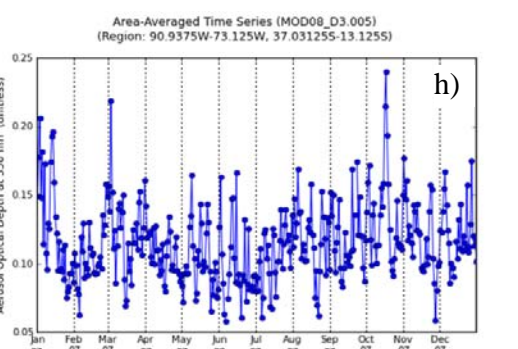
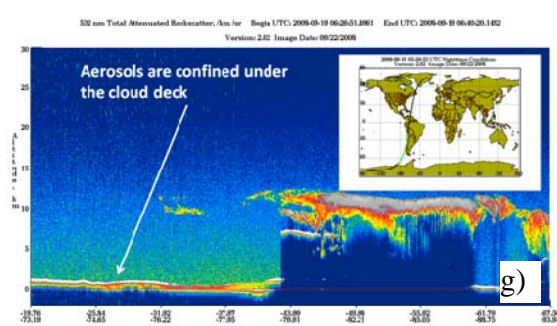
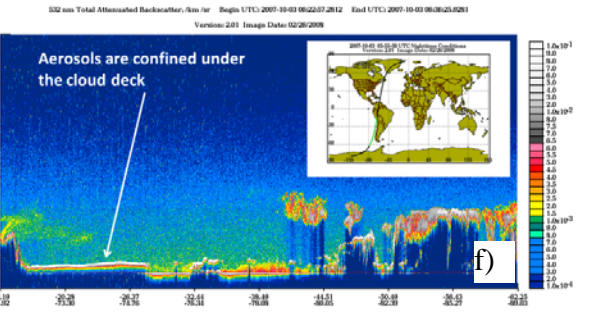
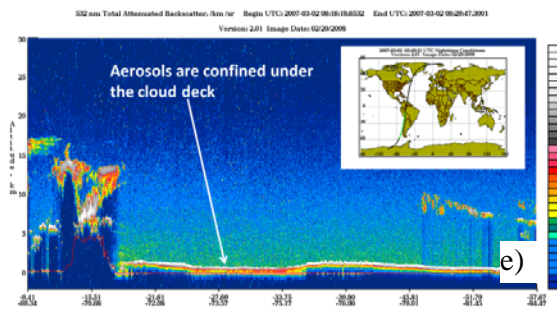
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Figure S5. The 7-yr averaged vertical pressure velocity (Pa/s). Left column - March to May, middle column - Jun to August and right column - September to November. From top to bottom: clean, moderately and heavily polluted cases.

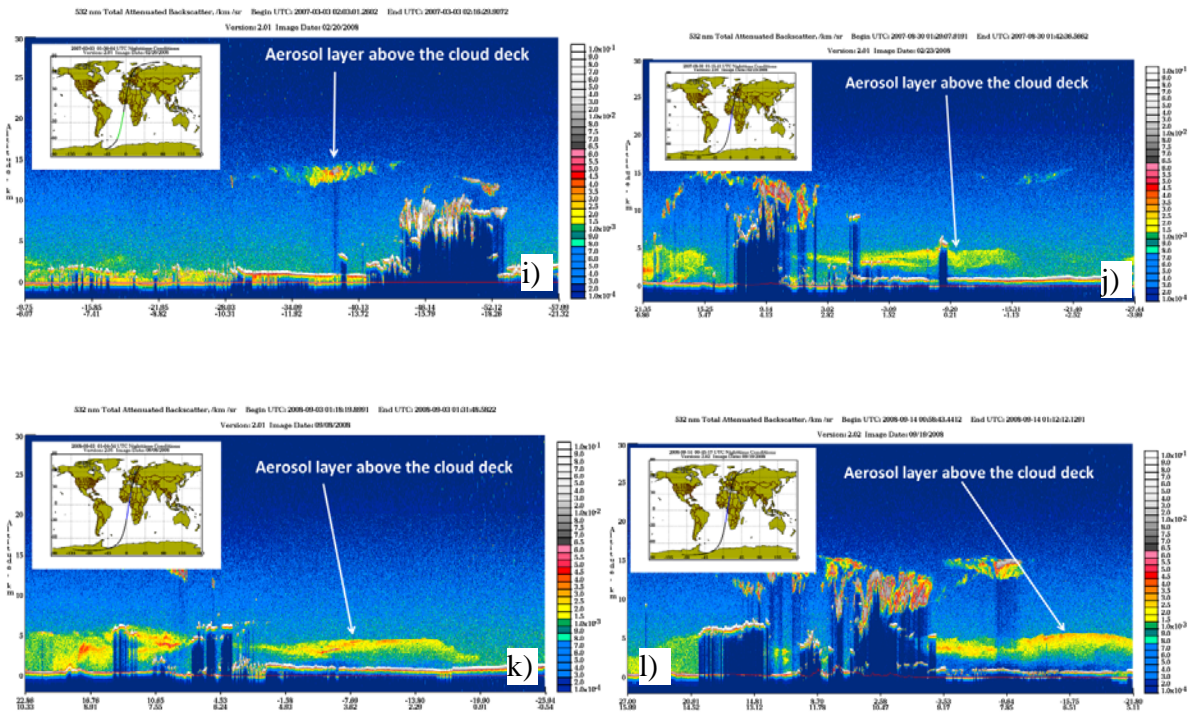
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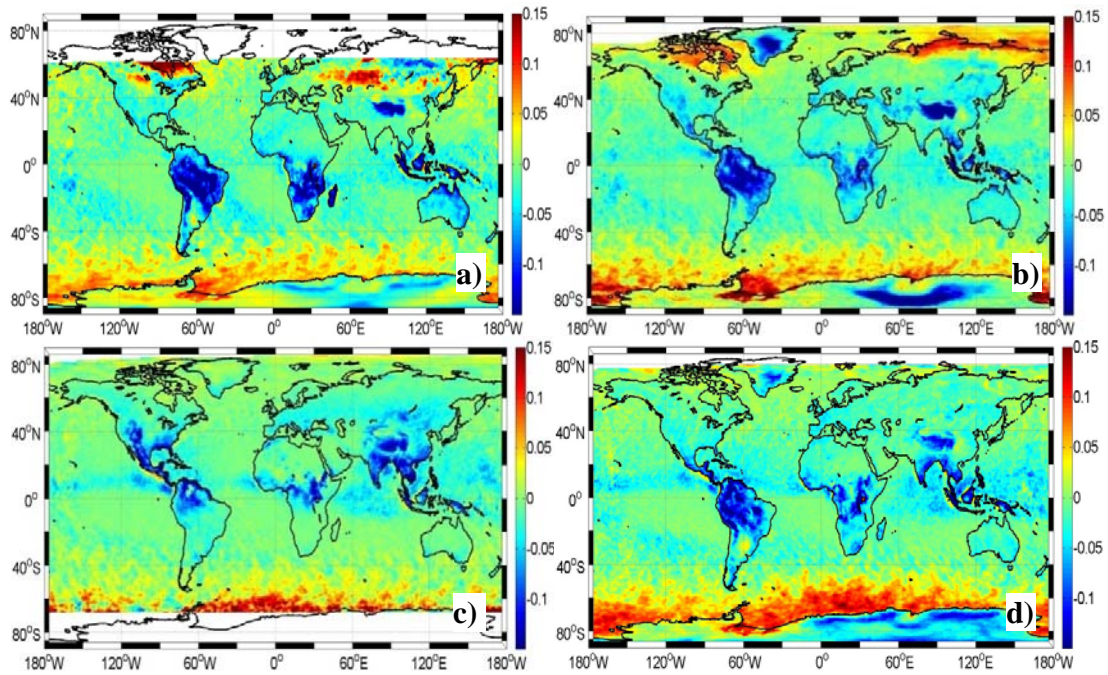


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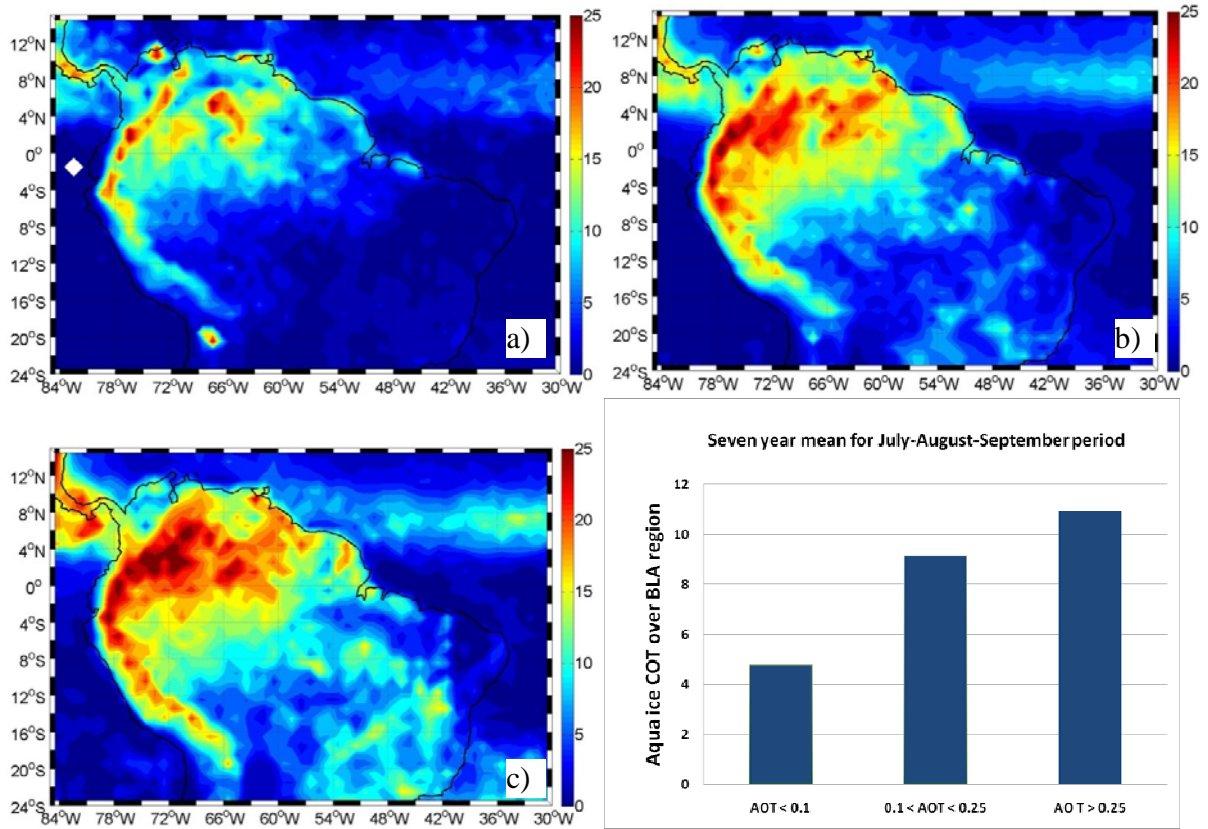
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Figure S6. Case studies for the vertical distribution of aerosols and clouds in selected three stratocumulus cloud regions: a) b) c) d) – CAL; e) f) g) h) – PE, i) j) k) l) - SAF.



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Figure S7. Global distribution of 7-yr averaged morning minus afternoon values for ice cloud fraction (IF) for a) December –February; b) March – May; c) June – August; and d) September – November.



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Figure S8. 7-year averaged Aqua ice cloud optical thickness for a) Clean, b) moderately polluted and c) heavily polluted cases. Bar graph shows 7-year mean for July-August-September period over Brazilian Legal Amazon region.

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