

## A Seven-year (2006-2013) Record of NonMethane HydroCarbons (NMHC) in the Subtropical Marine Boundary Layer at the Cape Verde Atmospheric Observatory

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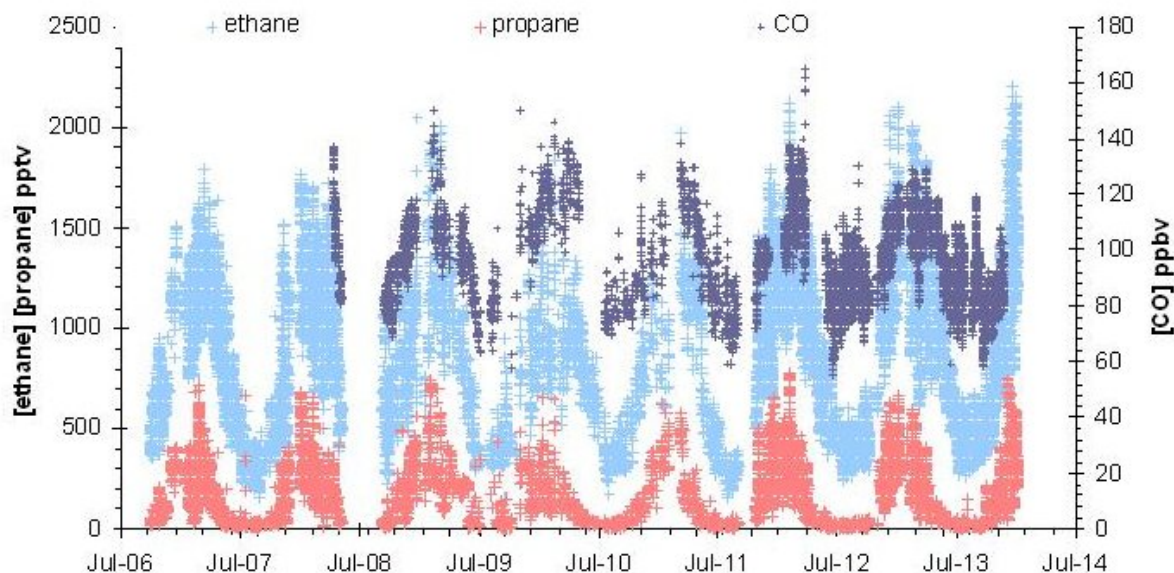
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We report observations of light NonMethane HydroCarbons (NMHC), methane ( $\text{CH}_4$ ) and carbon monoxide (CO) measured in the subtropical marine boundary layer at the Cape Verde Atmospheric Observatory ( $16^\circ 51'$  N,  $24^\circ 52'$  W) in the east Atlantic Ocean. Presented in Figure 1 is a time series of ethane, propane and CO measured during Oct 2006 - Dec 2013, showing well-defined seasonal cycles with spring maxima and summer minima, consistent with the seasonal variation of the OH radical. Simulations of NMHCs using the Community Atmosphere Model with Chemistry (CAM-chem) model show good agreement with the observations and allow an investigation of source attribution over the time series record. The major sources of ethane are shared with those of methane, and we investigate the relationship between ethane mixing ratios and the methane atmospheric growth rate over the past 7 years. The potential impact of Cl-atom reactions on the atmospheric removal of selected hydrocarbons in the marine atmosphere is also investigated. Oceanic emissions of alkanes may perturb such ratios, obscuring the discrimination of OH from Cl chemistry. Using hydrocarbon variability-OH lifetime relationships, we also show evidence for oceanic emissions of reactive alkenes (ethene and propene).



**Figure 1.** Time series of ethane, propane and CO during Oct 2006 - Dec 2013.