



## **Interannual Variability and Trends of C2-C11 Non-Methane Hydrocarbons in a Subtropical Area close to the Gulf of Mexico**

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Speciated C2-C11 non-methane hydrocarbons (NMHC) have been measured online on an hourly basis at Lake Jackson/TX close to the Gulf of Mexico. Altogether 48 NMHCs, including the GAW NMHC compounds, along with NO, NO<sub>2</sub>, NO<sub>x</sub>, O<sub>3</sub> have been collected continuously from January 2004-December 2013 under the auspices of the Texas Commission on Environmental Quality.

Data was screened for background conditions representing marine wind sectors. The data set represents a combination of marine air masses mixed with local biogenic emissions. The data analysis addresses photochemical processing of air masses as reflected in the relationship of ln(n-butane/ethane) vs. ln(propene/ethane) and ln(i-butane/ethane) vs. ln(n-butane/ethane). In addition, key NMHC relationships for radical chemistry, e.g. i-butane vs n-butane for OH and Cl chemistry and i-pentane vs. n-pentane for NO<sub>3</sub> chemistry, are discussed.

Seasonal analysis revealed a clear trend with maximum NMHC mixing ratios in winter time and lowest mixing ratios in summer reflecting the impact of photochemical processes in summer. Propene equivalents were highest during summertime, with significant contributions from alkenes, including isoprene. The relation of propene/ethane vs ethane indicates seasonal variation with lowest values (i.e. most aged air masses) in winter.

Contrary to usual GAW NMHC sampling procedures, which at least requires routine daytime samples (e.g. for canister samplings), continuous NMHC data collection allows to analyze nighttime data, which is least impacted by photochemical processes and potentially well-suited for trend analysis. Corresponding trend analysis for the Lake Jackson data suggests an overall slight decrease of selected NMHCs over the 2004-2013 period.