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Measuring the global distribution of non-methane hydrocarbons utilizing the NOAA flask sampling network

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The NOAA flask sampling network is one of the most extensive global monitoring programs for atmospheric trace gases with currently 68 stations. Monitored species include carbon dioxide, carbon monoxide, methane, sulfurhexafluoride and hydrogen as well as the stable isotopes of carbon, oxygen and hydrogen. To further improve the understanding of atmospheric processes, we have developed an automated GC-FID system to quantify C2 to C6 non-methane hydrocarbons (NMHCs) from the sampling flasks. The instrumental set-up and calibration as well as data quality procedures will be detailed.

Since March 2005 more than 1200 samples (2400 flasks) were analyzed from 40 different stations expanding from 82 ˚N to 90 ˚S. These measurements have the potential to significantly improve our understanding of atmospheric processes especially in combination with measurements of the other trace gases conducted by NOAA. Global distribution profiles with good temporal and regional resolution for the most important NMHCs will be displayed. The global profile of concentration ratios of isopentane to pentane and of propane to ethane will be shown. These profiles can help to understand the role of atmospheric oxidants such as nitrate or the hydroxyl radical.