

1. INTRODUCTION

Under Project H103B Baylor University continued and extended the preliminary data analysis that was performed as part of the measurement campaign funded under HARC project H63. The data collected in the H63 program included 50 flight hours performed in the Houston area as part of the TEXAQS II program. Measurements collected included ozone (O₃), reactive nitrogen compounds (NO, NO₂, and NO_y), carbon monoxide (CO), alkenes (RAD instrument), formaldehyde (HCHO), particle number density sized from 0.5-10 μm (particle spectrometer), integrated particle scattering (3-λ nephelometer), up and downward facing j(NO₂) filter radiometers, VOC canister grab samples, wind speed and direction, temperature, relative humidity, pressure, and GPS location.

The preliminary data analysis performed in H63 indicated several occasions where primary HCHO emissions may have been observed. These instances were examined in detail to identify the likely sources. In addition, the entire suite of measurements was examined to highlight what the expected emission ratios of HCHO/CO and HCHO/NO_x are as a function of source type. The airborne-based data was particularly well-suited for this analysis since the time a given plume has reacted in the atmosphere is often quite short and may be quantitatively understood based on the observed wind vectors. The data analysis resulting from this effort is presented in Section 2.1 of this report.

Also, as part of this data analysis effort Baylor University compared the aloft data collected on the Baylor aircraft with the various surface-based measurements. Particular attention was paid to comparison between the aircraft data and the data collected at the Moody Tower site, and to the comparative measurements collected in the TCEQ surface network. This portion of the analysis serves to establish a Level 2 quality assurance (NARSTO QA/QC guidelines) benchmark for both the airborne data and the comparative surface observations. The results of this data comparison effort are presented in Section 2.2 of this report.

Table 1-1 presents a summary of the flights performed during the 2006 measurement intensive period. The flights listed there constitute the source of data for both analysis tasks.

Table 1-1. Summary of flights performed.

Flight number	Flight date/time	General flight description
1	8/30/06, morning	SOF box – ship channel region
2	8/30/06, afternoon	Urban transport – Houston
3	8/31/06, morning	SOF box – ship channel region
4	8/31/06, afternoon	Urban transport – Houston
5	9/13/06, morning	SOF box – ship channel region
6	9/13/06, afternoon	Urban transport – Houston
7	9/20/06, afternoon	Coastal sources and SOF
8	9/27/06, afternoon	Coastal sources, Sweeney, SOF
9	10/5/06	Moody tower, Vertical Mixing Experiment (VME)