Smart Balloon Participation in TexAQS II

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TCEQ Meeting
Austin, TX
April 18, 2006
Smart Balloon Platform

Power from the solar panels is routed via separate wires to the Li-ion batteries attached to the lower portion of the balloon.

Release from Orient, Long Island
In July 2004 during ICARTT.
Smart Balloon Components

- Instrument Housing
- Instrument Package
- Drop Counting Rain Gauge
- UNH Mini-O₃
  - Top View
  - Bottom View
- Cut-Down Mechanism
Application by Max Planck Scientists in Forest-Atmosphere Study in Germany

Tethered blimp with mini-O³ sensors inside white styrofoam container (left) and example profile data collected with the system (right).

Collaboration with Sharon Zhong & Barry Lefer at Coastal Site During TexAQS II.
<table>
<thead>
<tr>
<th>Balloon Flight</th>
<th>Duration hrs. (d)</th>
<th>Distance Traveled (km)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>21 (0.88)</td>
<td>568</td>
</tr>
<tr>
<td>2</td>
<td>49 (2.0)</td>
<td>1030</td>
</tr>
<tr>
<td>3</td>
<td>295 (12.3)</td>
<td>6780</td>
</tr>
<tr>
<td>4</td>
<td>85 (3.5)</td>
<td>2530</td>
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In-flight Comparisons of O$_3$
Selected parameters (15 min. averages) measured along the flight path of balloon 4.
“Snap-shot image” of the MM5 instantaneous wind vectors at ~500 m altitude with CMAQ O₃ mixing ratios and balloon GPS/O₃ superimposed on the domain field for 2100 UT August 5. The O₃ mixing ratios from CMAQ and the balloons are on same color scale. Balloon 3 leads the way in the upper right hand corner of the domain.
Geographic distribution of surface $O_3$ during July 19 – 25 (dots) and August 3 – 8 (asterisks) from the *Ronald Brown* measurements (a), CMAQ model simulations (b), and as a time series comparison (c).
CMAQ - CO

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Mao et al., JGR, in press, 2006
Rob Griffin will conduct measurements with the UNH AMS at UH-Moody Tower Site