Update of IIP Tropospheric Infrared Mapping Spectrometers (TIMS) for measuring CO profile: Analysis of measurements obtained in a deployment on an airship

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Table 1. Comparison of precision of retrieved column in the 2008 IIP joint campaign with University of Denver vs preliminary results from the 2010 Zeppelin deployment

<table>
<thead>
<tr>
<th></th>
<th>CH4</th>
<th>CO</th>
<th>H2O</th>
<th>albedo</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIP 2008</td>
<td>0.40</td>
<td>1.86</td>
<td>17.2</td>
<td>7.44</td>
</tr>
<tr>
<td>Zeppelin</td>
<td>0.60</td>
<td>1.16</td>
<td>17.0</td>
<td>4.54</td>
</tr>
</tbody>
</table>

Table 3. Model & retrieved columns [molecules/cm²]

<table>
<thead>
<tr>
<th></th>
<th>CH4</th>
<th>CO</th>
<th>H2O</th>
<th>&quot;ncen&quot; columns</th>
<th>gats LC columns</th>
<th>retrieved columns</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH4</td>
<td></td>
<td></td>
<td></td>
<td>3.54E+19</td>
<td>3.45E+19</td>
<td>3.61E+19</td>
</tr>
<tr>
<td>CO</td>
<td></td>
<td></td>
<td></td>
<td>2.37E+18</td>
<td>2.37E+18</td>
<td>1.89E+18</td>
</tr>
<tr>
<td>H2O</td>
<td></td>
<td></td>
<td></td>
<td>5.70E+22</td>
<td>7.32E+22</td>
<td>6.48E+22</td>
</tr>
</tbody>
</table>

Conclusions from the zeppelin deployment
• performance is consistent with that reported from the 2008 joint field campaign with Denver University
  – This supports the conclusion from the IIP08 study that the TIMS will satisfy all the GEO-CAPE requirements for CO measurements
• Highly variability albedo is a non problem.
• We have shown an example of removing the smile.

Tasks still to be done
• Retrieval from data acquired
  ▪ a covered over land fill and
  ▪ Moffett Field

Example: sun glint off the bay
Sample spectral images & corresponding video frames

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