Airborne Lidar Measurements of Atmospheric Pressure using the Oxygen A-Band

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Need for O2 Measurements

- We need surface pressure for the 'determinant' of the dry mixing ratio of CO2

\[ \text{CO}_2 = \left(1 - 0.0286 \times 0.001 \right) \times N(\text{AR}) \]

- ATBDs to the CO2 dry run errors, N(AR) in ESP, at dusting wind stressed, return, and relative run, with a 2.1 m/s wind speed, with no effective pressure.

- Unresolved factors: ground, atmospheric, surface pressure. Is there an accumulation of dust from backscatter and optical coverage?

- If there are pressure measurements across the backscatter, a pressure correction needs to be done.

O2 Airborne Instrument with IPDA

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2011 Analysis Summary

- All flight analyzed
- Random D0D error - 2 - 3 % Systematic Bias - 8 %
- Paper submitted to Applied Optics

Summary and future plans

- Improved 2013 analysis using and enhanced approach to applied optics
- Improved O2 polarimetric (O4A) sensitivity determination
- Shaded 20D (CO2)
- Improved retrieval software and scaled output estimation
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