

1. Redesign and Improved Performance of the Tropospheric Ozone Lidar at Table Mountain.

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4. Abstract

We describe improvements a lidar system located at the Jet Propulsion Laboratory (JPL Table Mountain Facility (TMF) for measuring ozone profiles the troposphere and lower stratosphere. The changes were primarily related to the optical receiver and the data acquisition system. The goals of these modifications were to increase the spatial and temporal resolution of the lidar, to extend the altitude range covered, and to improve the quality of the raw data.

There are two aspects to this presentation. First we will provide a description of the lidar system and then we will show ozone profile measurements that demonstrate the performance of the lidar. The system routinely makes nighttime measurements from approximately 5 to 20 km altitude with a maximum vertical resolution of 60 m. Daytime measurements are also possible but the upper altitude is lowered. The nighttime measurements extend to high enough altitudes that several kilometers of overlap can be achieved with the stratospheric ozone lidar also located at TMF. Thus, an ozone profile from 5 to 55 km altitude can be obtained if both systems are used.

The lidar uses a dual-beam Raman shifted Nd:YAG (IV harmonic, 266 nm) for the transmitter giving a choice of DIAL wavelength pairs: 289/294, 294/299, and 289/299 nm. The main receiver telescope has a 0.9 m aperture and this is augmented with two 50 mm telescopes for lidar returns close to the ground. Optical fibers are used to couple the telescopes to the four-channel receiver in a novel arrangement.

The work described in this paper was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under an agreement with the National Aeronautics and Space Administration. Georg Beyerle is now at the Alfred Wegener Institute, Potsdam, Germany.

5. Topic: (2) Observation techniques and intercomparisons.

Presentation: Poster preferred

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