NDSC and the JPL Stratospheric Lidars

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Abstract

The Network for the Detection of Stratospheric Change is an international cooperation providing a set of high-quality, remote-sensing instruments at observing stations around the globe. A brief description of the NDSC and its goals is presented. Lidar has been selected as the NDSC instrument for measurements of stratospheric profiles of oz.one, temperature and aerosol. The Jet l'repulsion laboratory has developed and implemented two stratospheric lidar systems for NDSC. These arc located at 'J'able Mountain, California, and at Mauna Loa, Hawaii. These systems, which utilize differential absorption lidar, Rayleigh lidar, Raman lidar anti backscatter lidar, to measure ozone, temperature and aerosol profiles in the stratosphere arc briefly described. 1 examples of results obtained for both long-term and individual profiles are presented.

Keywords: Observational Networks, Lidar, Differential Absorption, Ozone, Stratosphere.

1. Network for the Detection Of Stratospheric Change (NDSC)

The idea for a network of high-quality, remote-sounding research stations for observing and understanding the physical anct chemical state of the stratosphere was first discussed at a workshop in 1986 [NASA UARP, 1986]. In the ensuing period planning for the network continued and new instruments were designed, implemented and tested leading to the official start of NDSC network operations in January 1991.

The NDSC has three stated primary goals [NDSC Brochure, June 1992]:

To make observations through which changes in the physical and chemical state of the stratosphere can be determined and understood. In particular, to make the earliest possible identification of changes in the ozone layer and to discern the causes of the changes.

To provide an independent calibration of satellite sensors of the atmosphere.

To obtain data that can be used to test and improve multidimensional stratospheric chemical and dynamical models, thereby enhancing confidence in the predictive and assessment capabilities of these models.

'J-o achieve these goals a number of species and parameters were identified for which global measurements, in the altitude region from the tropopause to approximately *50* km, arc of the highest priority. These measurements anti the associated NDSC instruments arc