



CIS-LiNet - lidar network in CIS countries

A. Chaikovsky (1), Yu. Balin (2), A. Elnikov(2), G. Tulinov (3), I. Plusnin (4), O. Bukin (5), and B. Chen (6)

(1) B.I.Stepanov Institute of Physics, National Academy of Sciences of Belarus

Minsk, Belarus. (chaikov@zege.bas-net.by / Phone: 375-17-2842891, Fax: 375-17-2840879)

(2) Institute of Atmospheric Optics, Siberian Branch of the Russian Academy of Sciences, Tomsk, Russia

(3) Fedorov State Institute of Applied Geophysics (IAG), Moscow, Russia

(4) Surgut State University (SSU), Surgut, Russia

(5) Ilyichev's Pacific Oceanological Institute, Far Eastern Branch of the Russian Academy of Sciences, Vladivostok, Russia

(6) Kyrgyz-Russian Slavic University (KRSU), Bishkek, Kyrgyz Republic

Introduction

Atmospheric aerosol and ozone monitoring appears an important prerequisite to validly forecast climatic changes and solve ecological problems. Global and regional measuring networks are being arranged to obtain reliable data on spatial and temporal transformations of atmospheric components. v

In 2000, the European Aerosol Research Lidar Network (EARLINET) has been formed. It provides the coordinated operation of 24 lidar stations to monitor large-scale aerosol transport in the European region and investigations of aerosol effects on climate and ecological conditions.

Lidar studies of Asian dust outbursts to the Pacific Ocean regions are being performed within the Asian Dust Network (AD-Net).

Thus, routine coordinated lidar observations began to be carried out on the West and South-East of the Euroasian continent.

However, no coordinated lidar observations are carried out commonly with International networks at the CIS territory, except those made by the lidar station of the Institute of Physics, National Academy of Sciences of Belarus within the scope of the EARLINET network. The absence of systematic data on parameters of atmospheric components at the huge CIS territory is a critical factor introducing the ambiguities to prevent from forecasting climatic and ecological changes. It is impossible to study global processes of the transformations of atmospheric components and effectively solve ecological problems at the Eurasian continent without having the information on parameters of atmospheric species and on their transport over the CIS regions.

The formation of the lidar network in CIS countries should change the present situation. In December 2004 the project on CIS-LiNet (lidar network in CIS countries) formation was started, supported by the International Science and Technology Center (ISTC). The main Project aim will be the development of a lidar station network at the CIS territory implementing atmospheric monitoring at the Eurasian continent in cooperation with International measurement networks and providing data on the formation of aerosol and ozone transport in the atmosphere available for users.

CIS-LiNet structure

The concept of CIS-LiNet creation, list of tasks and methodology of their solution have been developed from the results and experience of EARLINET activities with the account of specific requirements to the users' information in CIS countries.

The following stations constitute CIS-LiNetL at the first stage of the network formation:

- Stationary lidar station in Minsk, Belarus, 53.917N, 27.383E (IP).
- Stationary lidar station in Tomsk, Russia, 56.48N, 85.05E (IAO).
- Seasonal lidar station on the base of a mobile lidar at the Lake Baikal region, 51.44 N, 105.06 E (IAO).
- Stationary lidar station in Surgut, Russia, 61.25 N, 73.50E (SSU).
- Stationary lidar station near Moscow, Russia, 55N, 37E (IAG).
- Stationary lidar station and mobile shipboard lidar in Vladivostok, Russia, 43.01N, 131.9E (POI).
- Alpine stationary lidar station in Teplokluchenska in Central Asia, Kyrgyz Republic, 42.5N, 78.4E (KRSU).

All stations will carry out coordinated aerosol observations in the troposphere and

stratosphere. Two stations in Minsk and Tomsk will implement ozone sounding in the stratosphere layer.

Specific feature of CIS-LiNet stations is combined investigations with solar radiometric measurements, forming a constituent part of the AERONET. That is why, an important role in the observations program is featured to complex lidar and radiometric measurements.

Methodology

An important task for CIS-LiNet and every participating group is to provide measurements quality. To achieve this aim, a unification program of lidar equipment and the station on the whole is presupposed. Lidar equipment should be upgraded so that a multiwavelength sounding mode, measurement of lidar signal depolarization degree as well as Raman channel could be realized at every station.

Files format for primary and processed data, algorithms and software for data processing appear common for all network stations

Current state of activities

Presently, main efforts of the participating scientific groups are directed to equipment upgrade, methodology and software development to provide measurements and data processing. Coordinated routine measurements are scheduled for June 2005.

1 Acknowledgements

This work was supported by the International Science and Technology Center (ISTC), under Project B-1063.