New mESYLIDAR system testing measurements: first results considering meteorological context in North East region of Romania

M.M. Cazacu (1,2), A. Timofte (1,3), P. Mark (4), O. Tudose (2), S. Gurlui (1), D.O. Dorohoi (1), and I. Balin (4)

(1) Faculty of Physics, Al. I. Cuza University, Iasi, RO (cazacumarius@gmail.com), (2) ESYRO (EnviroScopY SRL), Tehnopolis – Science & Technology Park, Iasi, RO (ovidiu.tudose@enviroscopy.com), (3) Regional Forecast Center, 1 Cuza Voda Str, Bacău, RO (adrian.timofte@gmail.com), (4) EnviroScopY SA, PSE - EPFL, Lausanne, CH (ioan.balin@enviroscopy.com/ +41 797 598 953)

Aiming the remote sensing low cost, up-gradable and modular tools development for monitoring relevant atmospheric parameters processes in whole troposphere (100 m to 12-15 Km ASL), the new mini LIDAR system i.e mESYLIDAR, dedicated for tropospheric aerosols and clouds high temporal (minutes) and spatial resolutions (meters) investigations is described.

The up-gradable configuration of mESYLIDAR is based on a powerful Nd:YAG 30 Hz pulsed laser (35 mJ at 355 nm, 100 mJ at 532 nm, 200 mJ at 1064 nm), a 40 cm Newtonian telescope and on an new opto-mechanics detection module built in an "eye geometry" considerations.

First measurements, performed on the site of Science and Technology Park TehnopolIS (IASI city), located on the North Eastern region of Romania, using a basic configuration with elastic detection at 532 nm with depolarization study module were performed. Different types of clouds (altocumulus, cirrus and cirrostratus) up to 12 km in daylight are highlighted using profiles obtained with mESYLIDAR system, confirmed also by satellite imagery.

The PBL height over the Iasi region was first time determined from the LIDAR data as well as the aerosols load and dynamics.

The HYSPLIT model (Hybrid Single Particle Lagrangian Integrated Trajectory model) was used to confirm the backward trajectories of aerosols and mixed depth layer. Synoptic situations and satellite data are useful for LIDAR data validation i.e. clouds occurrence.