

**EARLINET:
A European Aerosol Research Lidar Network
to Establish an Aerosol Climatology.**

Contract EVR1-CT1999-40003

Addendum to Handbook of Instrumentation.

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1 Introduction

In connection with the expansion of EARLINET to the Newly Associated States (NAS) in 2002, three new lidar stations have been included into the project. The groups started routine operation with the existing lidar systems at their institutes. Due to the short time period of EARLINET-NAS and because no funds were available for this task, significant upgrades of the systems (e.g. with additional elastic and/or Raman detection channels) could not be done.

This addendum to the handbook of instruments describes the additional lidar systems in tabular form. The basic methodology, the common features of all systems, and the individual system properties of the other systems are given in the handbook of instruments, published in September 2000. It is available at the EARLINET webpage <http://lidarb.dkrz.de/earlinet>.

2 Lidar Instruments, Individual Descriptions

The individual systems are described in tabular form, giving the main system characteristics.

2.1 Institute of Geophysics, Polish Academy of Sciences (IGF-PAS)

Contractor	: IGF.PAS
Location	: Belsk
Coordinates	: 51.5 N, 20.47 E
Laser type	: Nd:YAG, Ruby
Emitted wavelengths	: 532 nm, 694 nm, 1064 nm
Pulse energy (typ.)	: 25 mJ (532 nm), 500 mJ (694 nm), 100 mJ (1064 nm)
Repetition rate (typ.)	: 20 Hz (Nd:YAG), 0.08 Hz (Ruby)
Detector Channels	
1.	
Wavelength	: 532 nm
Detector	: PMT, FEU 84 (analog), FEU 140 (photon counting)
Data acquisition mode	: analog 12 bit, 20 MHz ADC, 100 MHz photon counting
Filter bandwidth	: 1.5 nm interference filter
2.	
Wavelength	: 694 nm
Detector	: PMT, FEU 84
Data acquisition mode	: analog 12 bit, 20 MHz ADC
Filter bandwidth	: 1.5 nm interference filter
3.	
Wavelength	: 1064 nm
Detector	: PMT, FEU 83
Data acquisition mode	: analog 12 bit, 20 MHz ADC
Filter bandwidth	: 4 nm interference filter
Scanning capability	: yes
Altitude range (typ.)	: 200-10000 m
Range resolution (raw)	: 15 m
Time resolution (raw)	: 1 s
Continuous acquisition	: yes
Transportable system	: no
Additional instruments	: Meteorological data (P,T,U) on a continuous basis, sun photometer, UV-B radiometer, visibility, SO ₂ , O ₃

2.2 Institute of Electronics, Bulgarian Academy of Sciences (IE-BAS)

System 1

Contractor	: IE.BAS
Location	: Sofia
Coordinates	: 42.65 N, 24.38 E
Laser type	: CuBr
Emitted wavelengths	: 511 nm
Pulse energy (typ.)	: 0.05 mJ
Repetition rate (typ.)	: 14 kHz
Detected wavelength	: 511 nm
Detector	: PMT, EMI 9863QB100
Data acquisition mode	: 40 MHz photon counting
Filter bandwidth	: 0.9 nm interference filter
Scanning capability	: no
Altitude range (typ.)	: 1000-10000 m
Range resolution (raw)	: 150 m
Time resolution (raw)	: not given
Continuous acquisition	: yes
Transportable system	: no
Additional instruments	: radiosonde data from nearby available

System 2

Contractor	: IE.BAS
Location	: Sofia
Coordinates	: 42.65 N, 24.38 E
Laser type	: Nd:YAG
Emitted wavelengths	: 532 nm
Pulse energy (typ.)	: 320 mJ (532 nm)
Repetition rate (typ.)	: 10 Hz (Nd:YAG)
Detected wavelength	: 532 nm
Detector	: PMT, FEU 84-3
Data acquisition mode	: analog 10 bit, 40 MHz ADC
Filter bandwidth	: 1 nm interference filter
Scanning capability	: no
Altitude range (typ.)	: 400-5000 m
Range resolution (raw)	: 120 m
Time resolution (raw)	: not given
Continuous acquisition	: yes
Transportable system	: no
Additional instruments	: radiosonde data from nearby available

2.3 Polytechnic Nova Gorica (PNG)

Contractor	: PNG
Location	: Noca Gorica
Coordinates	: 46.0 N, 14.5 E
Laser type	: Continuum Minilite I, Nd:YAG
Emitted wavelengths	: 355 nm
Pulse energy (typ)	: 5 mJ
Rep. Rate	: 1-15 Hz
Detected wavelengths	: 355
Detectors	: PMT, Hamamatsu 7400 R, Philips 2020Q
Data acquisition	: analog via 8 bit, 500 MHz oscilloscope
Filter bandwidth FWHM	: 50 nm (355)
Scanning capability	: yes
Altitude range (typ.)	: 400-5000 m
Range resolution (raw)	: 7.5 m
Time resolution (raw)	: 1 s
continuous acquisition	: yes
Additional instruments	: none