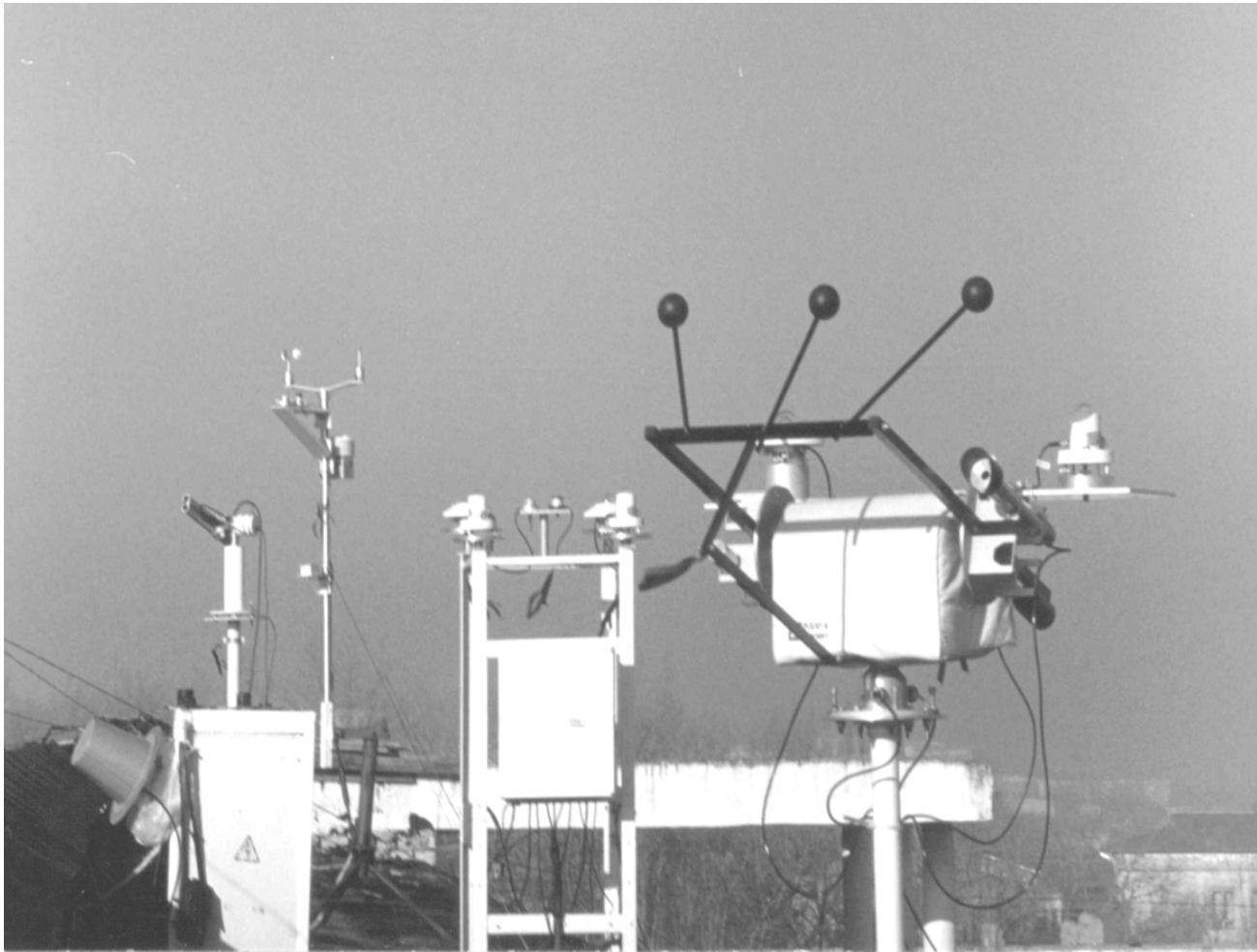


GROUND-BASED SOLAR RADIATION MONITORING STATION AT THE KISHINEV SITE: STRUCTURE AND OPERATION

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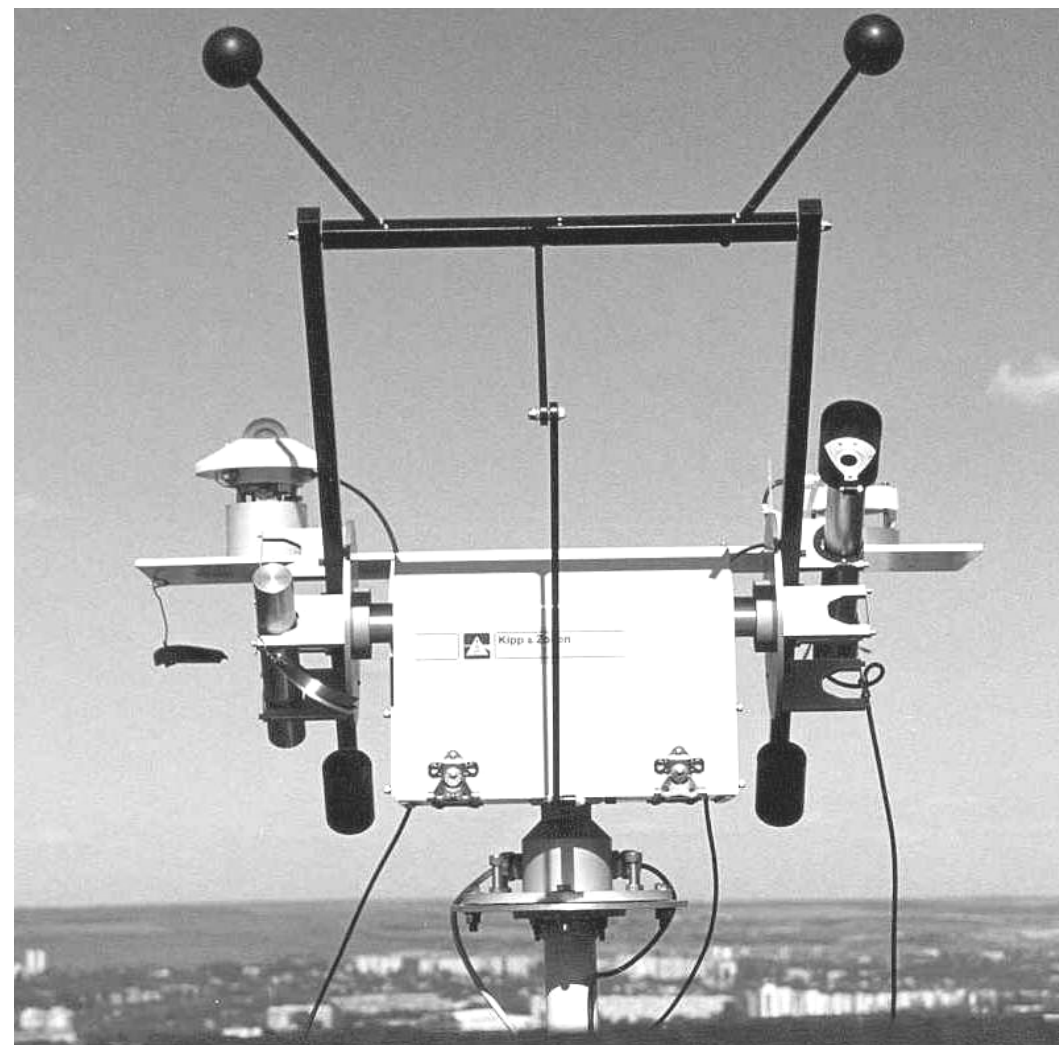
Ground-based solar radiation monitoring station in operation at the Institute of Applied Physics ($\varphi=47.0013^{\circ}\text{N}$, $\lambda=28.8156^{\circ}\text{E}$, $h=205$ m a.s.l.).

Station consists of multifunctional radiometric complex, Sunphotometer Cimel CE-318, hand-held ozonometer MICROTUPS II, automatic weather station MiniMet, and data logger CR10X.

Station is intended to carry out long-term continuous monitoring of radiative properties of atmosphere and to acquire datasets about broadband solar radiation (global, diffuse and direct components) from UV-B to IR, total column ozone content, spectral direct solar and diffuse sky radiance, basic meteorological observables. Ground based solar radiation monitoring station was registered in Global Atmosphere Watch Station Information System (GAW SIS) as a Regional fixed station in WMO RA VI – Europe.

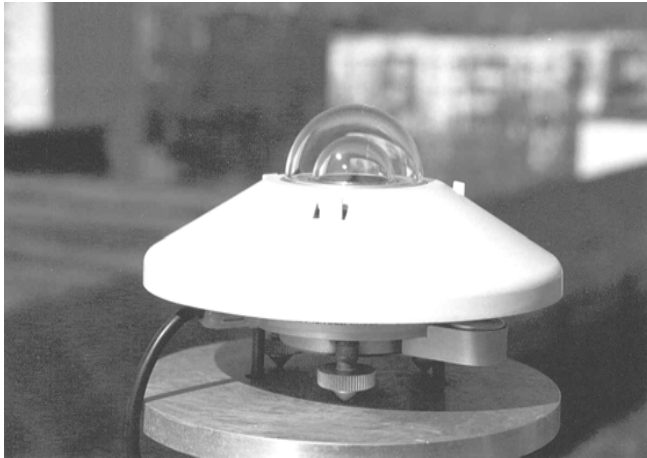


Stationary platform (with data logger CR10X) in operation

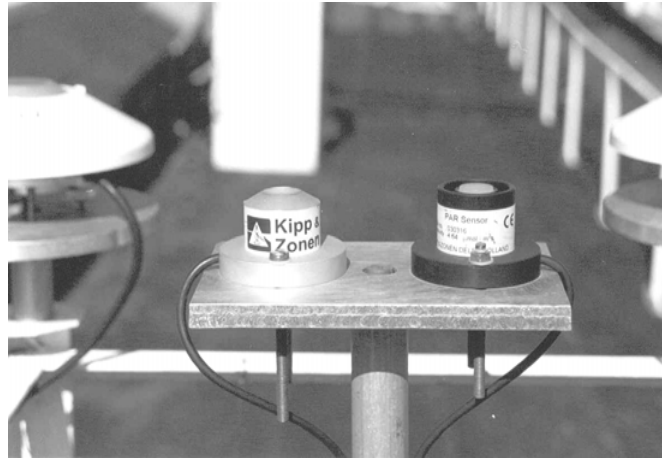


Moving platform in operation

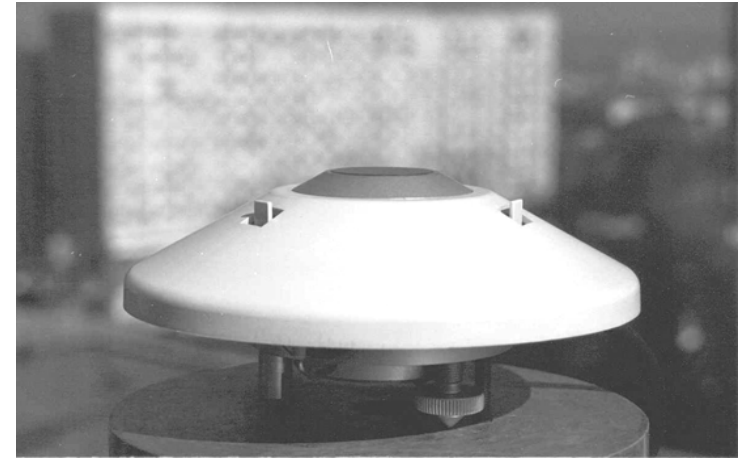
Multifunctional radiometric complex makes it possible to carry out the long-term continuous and simultaneous measurements of broadband solar and atmospheric radiation in a wide spectral wavelength region ranged from the ultraviolet biologically active (UV-B) radiation through the infrared atmospheric radiation (IR). Global components of solar and atmospheric radiation are measured at the stationary platform. Diffuse and direct components of solar radiation are measured at the moving platform based on automatic solar tracker 2AP BD. Data logger CR10X with memory module SM4M and multiplexer AM25T provides following mode of operation: scan rate of 1 Hz, 1-minute averaging and logging interval, and data archiving rate of 12 Mb/month.



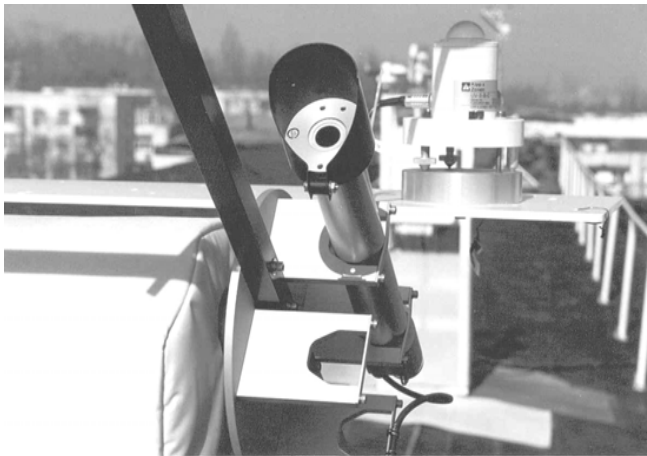
CM-11 sensors
for global & diffuse solar radiation
(305 – 2800 nm)



SP Lite & PAR sensors
for global solar radiation
(400 -700 nm & 400 – 1100 nm)



CG-1 sensor
for global atmospheric radiation
(4 – 42 μ m)

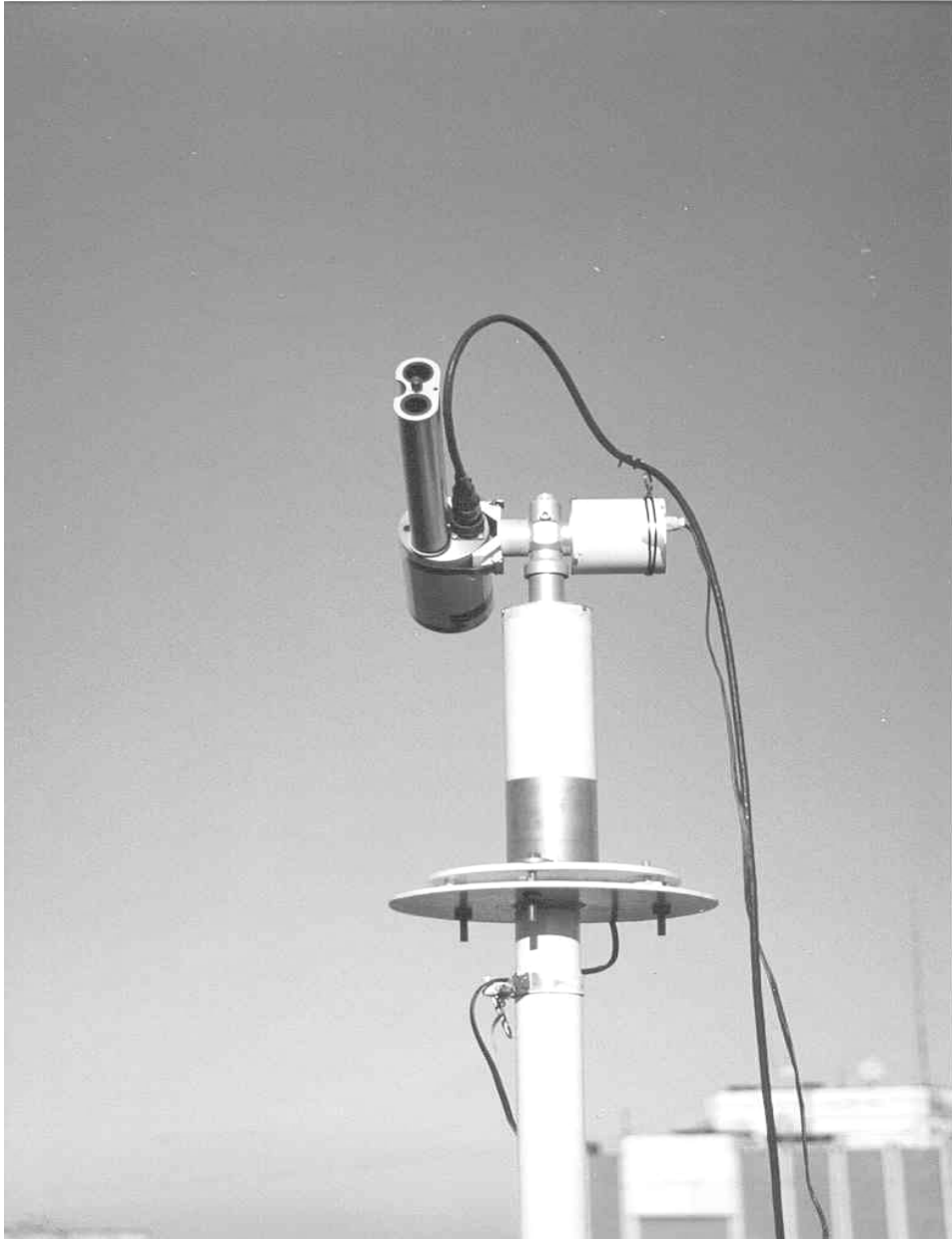


CH-1 sensor
for direct solar radiation
(200 – 4000 nm)

Broadband Solar Radiation Sensors



UV-S-B-C & UV-S-A-C sensors
for global & diffuse solar UV radiation
(280 – 315 nm & 315 – 400 nm)



Sunphotometer Cimel CE-318 in operation at the ground-based solar radiation station.

Sunphotometer Cimel CE-318 provides measurements of the direct solar radiance at 8 wavelengths in visible spectrum, $\lambda=340, 380, 440, 500, 670, 870, 940$ and 1020 nm; sky radiance in almucantar and in a solar principal plane at 4 wavelengths, $\lambda=440, 670, 870$ and 1020 nm. The channel at 940-nm is used to retrieve the precipitable water vapour content in atmosphere. Sunphotometer consists of the sensor head, electronics box with microprocessor and store module, and robot.

Sunphotometer was incorporated into the ground-based station with the aim to retrieve column-integrated aerosol optical properties such as spectral aerosol optical depth, volume size distribution function, single scattering albedo, phase scattering function, complex refractive index of aerosol matter.

Sunphotometer operates within the framework of international AERosol RObotic NETwork (AERONET) programme, managed by NASA/Goddard Space Flight Center. Kishinev site is a part of the globally distributed AERONET network including more than 200 stations all around the world.

Automatic weather station MiniMet (with DataHog 2 datalogger)

Weather station is used for measurements of the basic surface meteorological elements.

Period of operation: since June 17, 2003;

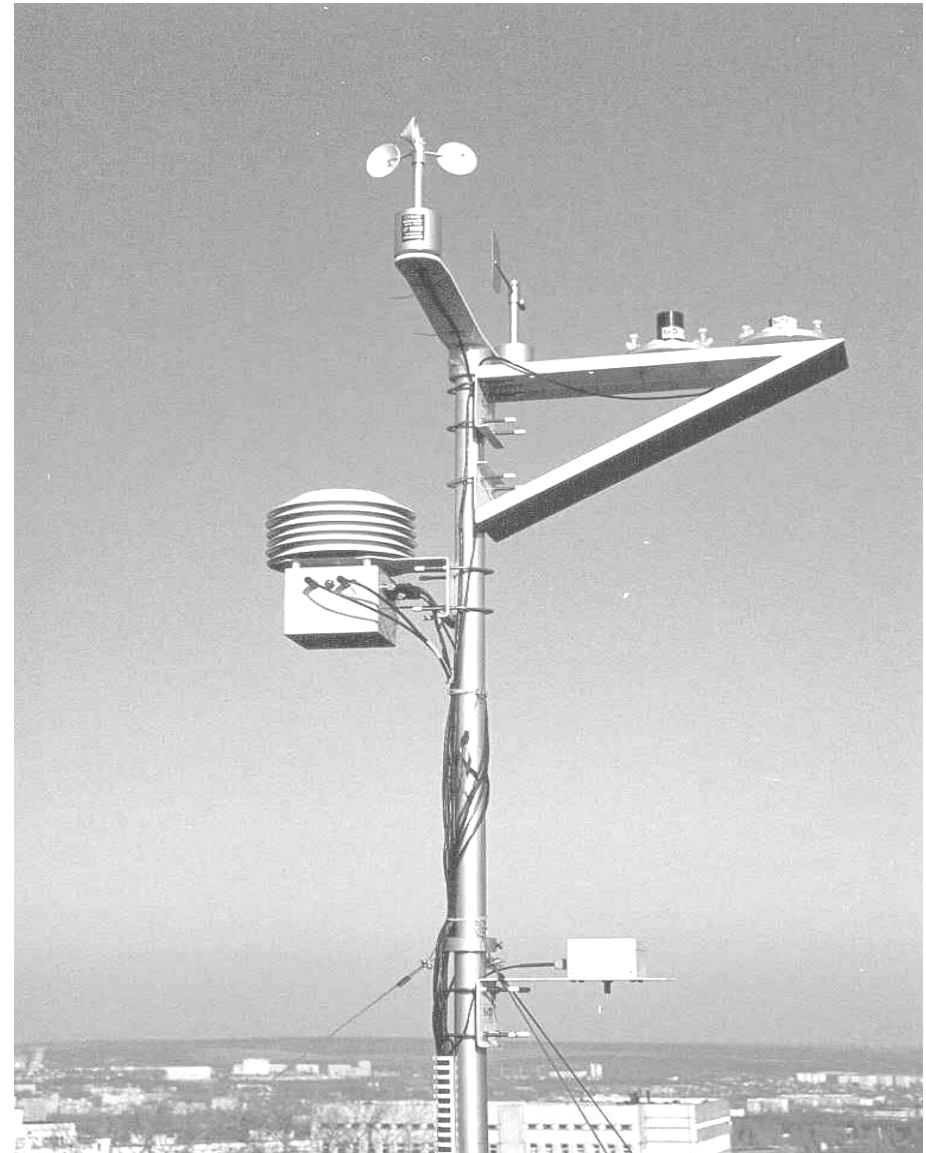
Measuring values: air temperature, atmospheric pressure, relative humidity, wind mean velocity and direction, solar irradiance in the wavelength range 400 – 1100 nm, and solar UV-B irradiance (280 – 315 nm).

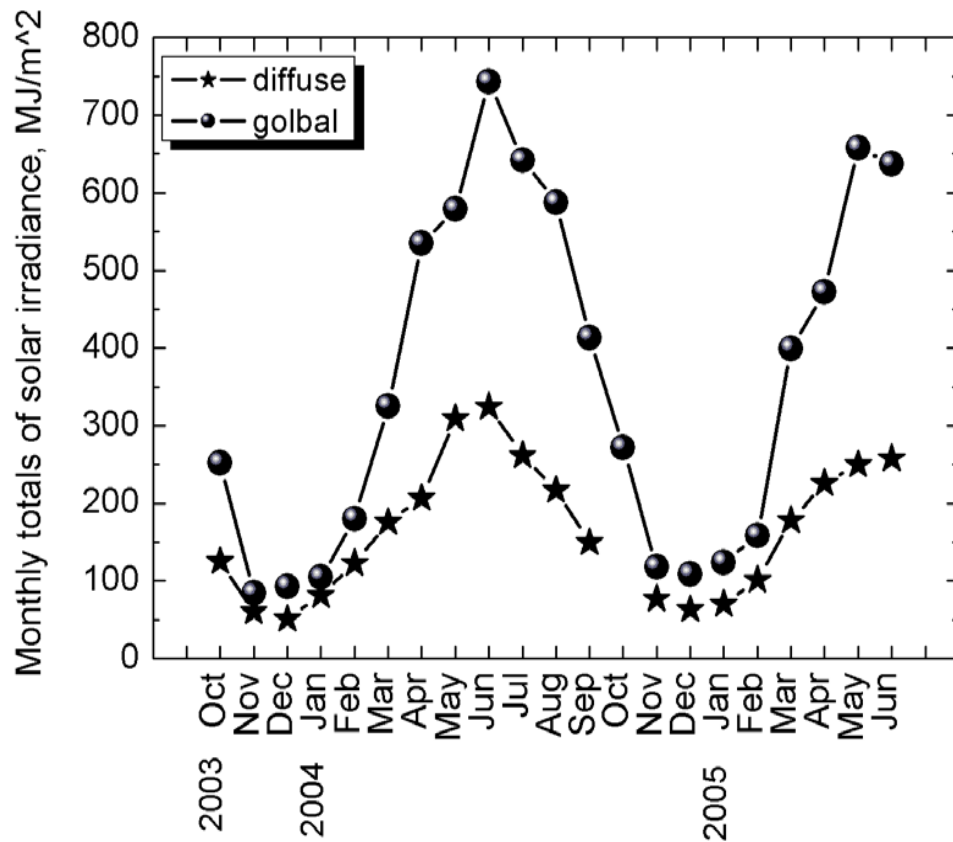
Scan rate (for each channel): 0.1 Hz ;

Averaging interval: 5 minutes;

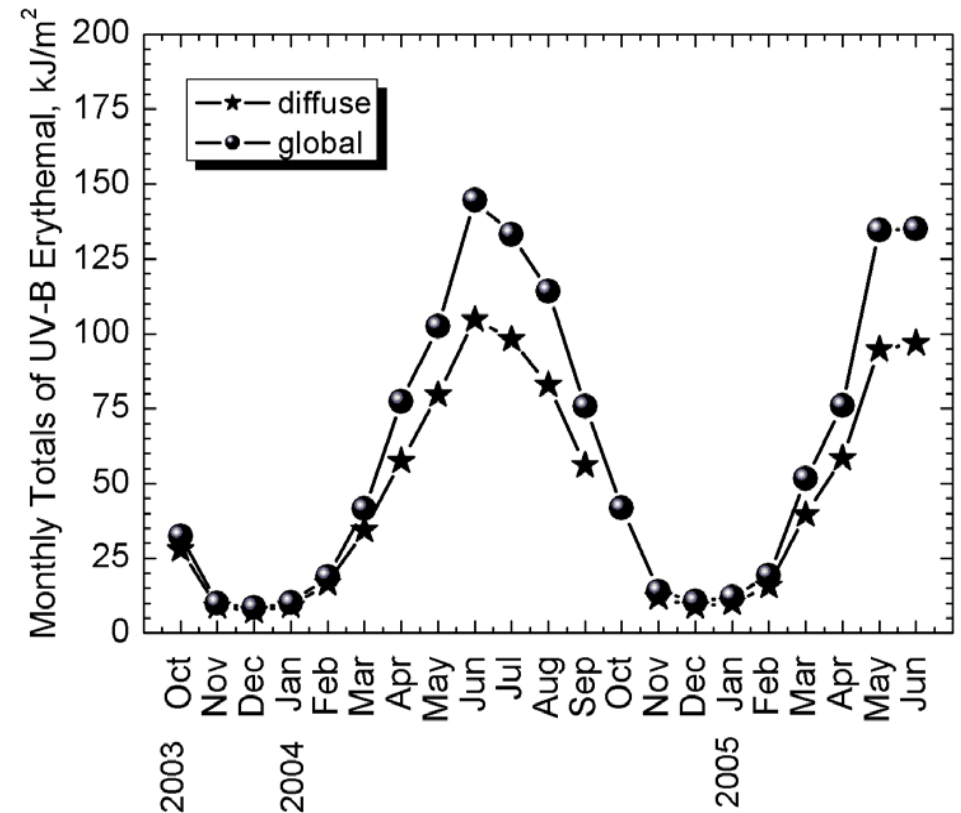
Logging interval: 5 minutes;

Data archiving rate: 1,2 Mb/month.

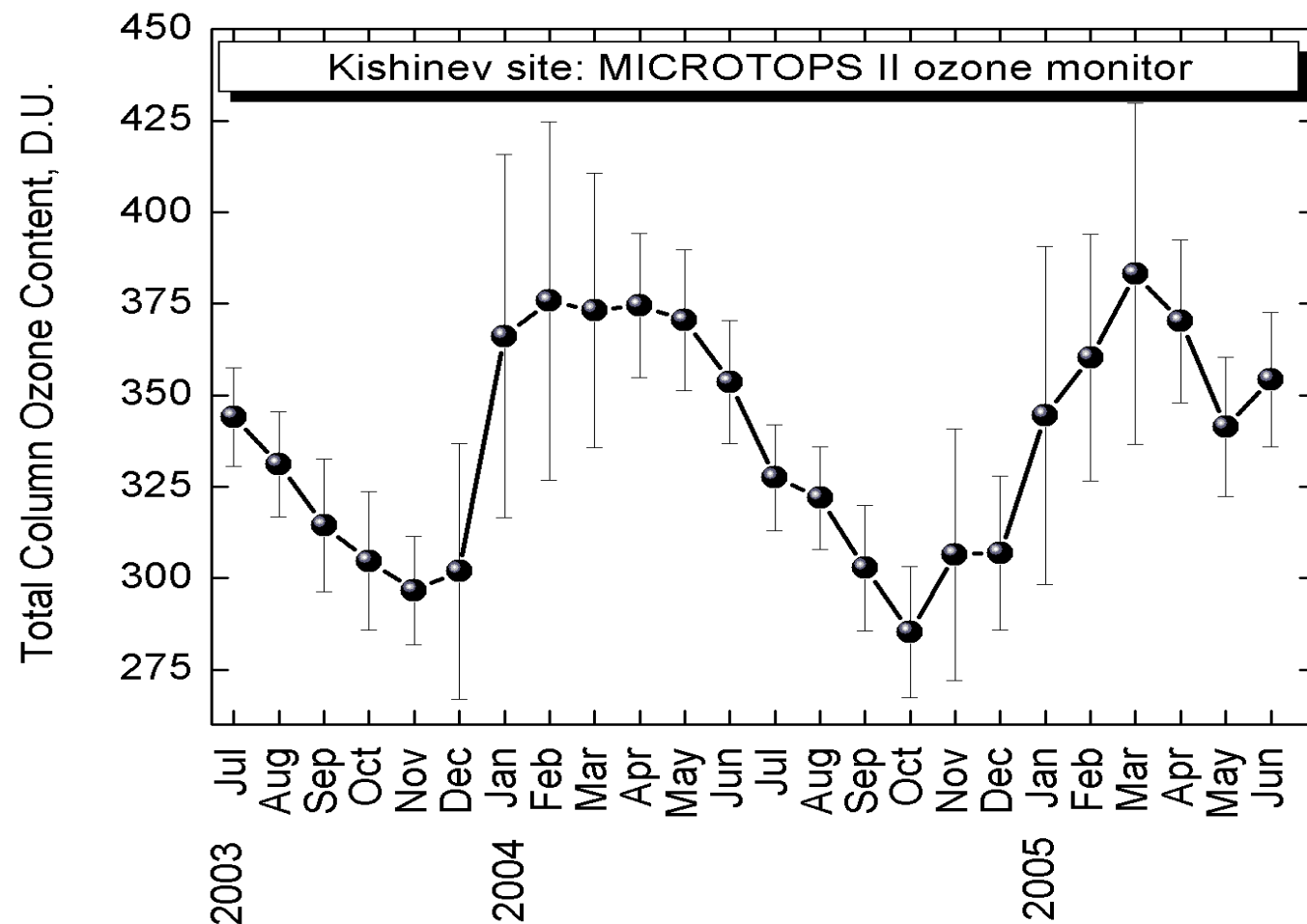




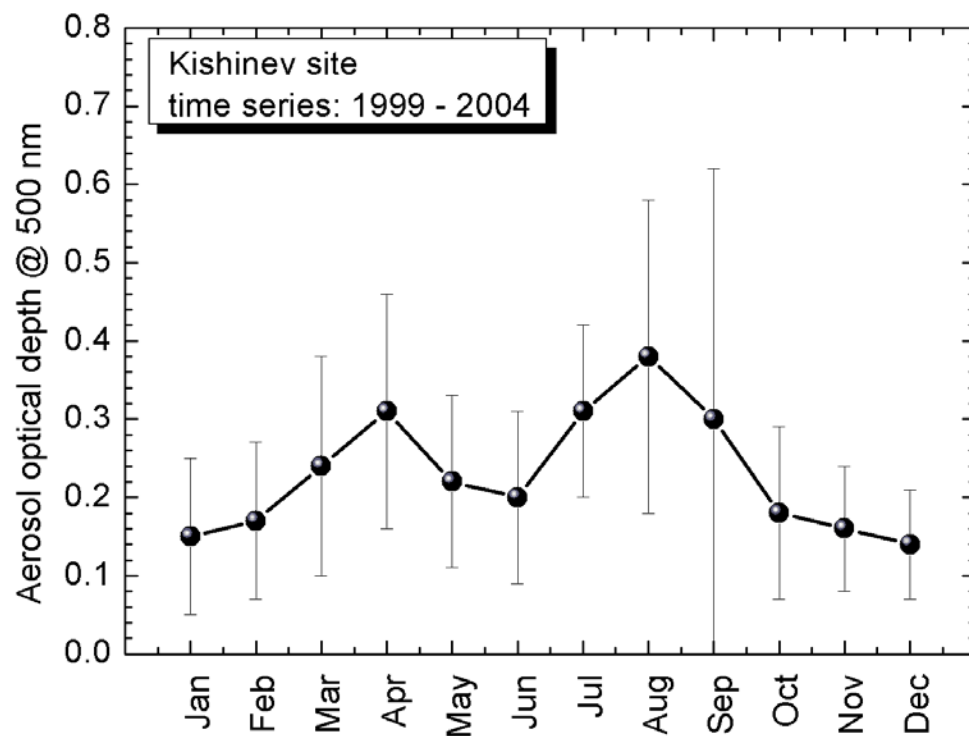
Time series of the monthly totals for diffuse and global components of solar radiation measured with the CM-11 sensors (305 – 2800 nm) at the ground-based solar radiation station. Period of observation from the October 2003 through the June 2005.



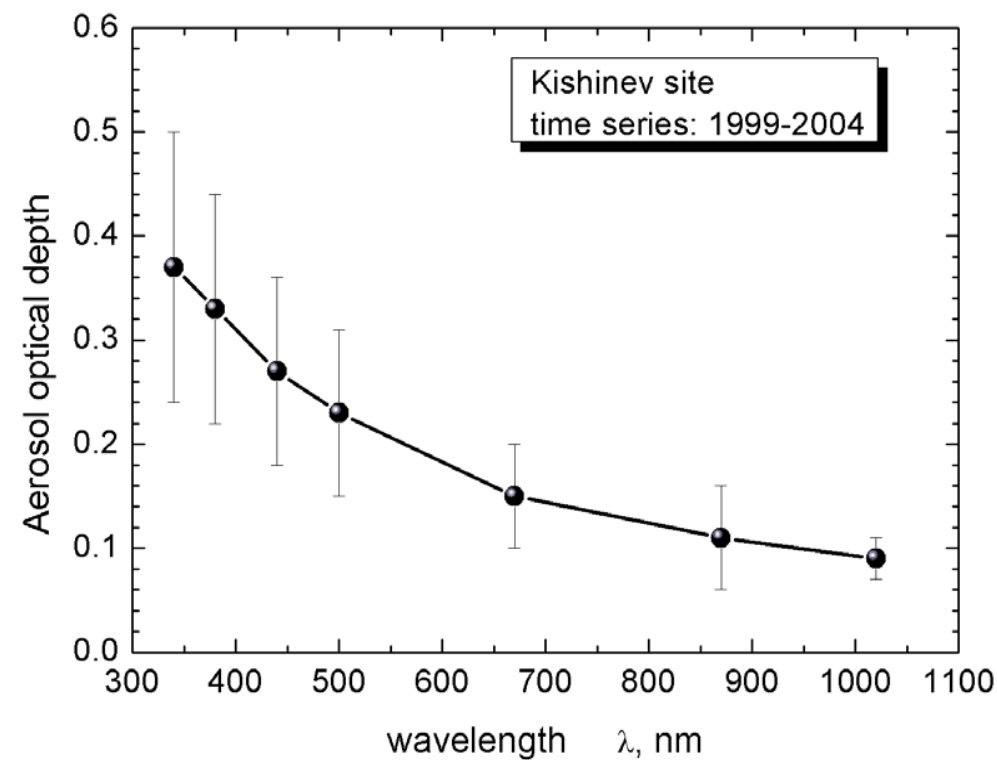
Time series of the monthly totals for diffuse and global components of solar UV-B erythemally weighted radiation measured with the UV-S-B-C sensors (280 – 315 nm) at the ground-based solar radiation station. Period of observation from the October 2003 through the June 2005.



Time series of the monthly mean values of the total column ozone content (in D.U.) measured with hand-held ozonometer MICROTOPS II at the ground-based solar radiation station. Period of observation from July 2003 through the June 2005.



Climatology of monthly mean values of the aerosol optical depth $\tau_a(500)$ at 500 nm based on the multiyear statistics from 1999 to 2004.



Spectral variability of the yearly mean value of the aerosol optical depth $\tau_a(\lambda)$ based on the multiyear statistics from 1999 to 2004.