

# Status of BSRN Station Lindenberg, Germany

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## October 1994 to October 2001

(first platform)

1994

30.09.

Start of measurements

Global radiation (G1):

Diffuse radiation (D):

Direct radiation (I1):

Direct radiation (Ir):

Atmospheric

downward radiation (A1): Eppley PIR 29344 F3

Kipp&Zonen CM21 930095

Kipp&Zonen CM21 930096

Eppley NIP 29536 E6

Eppley AHF 29221

## October 2001 to June 2003

(interim platform)

2001

01.10.

Start of measurements in parallel

Global radiation (G1):

Global radiation (G2):

Diffuse radiation (D):

Direct radiation (I1):

Direct radiation (I2):

Direct radiation (Ir):

Atmospheric

downward radiation (A1): Eppley PIR 32802 F3

Atmospheric

downward radiation (A2): Kipp&Zonen CG4 000517

Kipp&Zonen CM21 010824

Kipp&Zonen CM21 010825

Kipp&Zonen CM21 010826

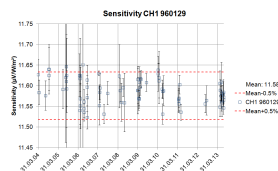
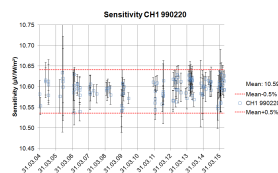
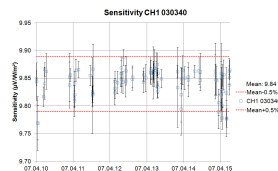
Kipp&Zonen CH1 99220

Eppley NIP 27804 E6

Eppley AHF 30113

## Time series of calibration results

The traceability of measured quantities to SI is important in meteorology and climatology, especially in the case of BSRN. Lindenberg Meteorological Observatory operates as a RRC/NRC a standard group consisting of two PMO6 and one HF absolute radiometer, having participated at the IPCs since 1985. Figures (right) show the daily averages of the sensitivity of the pyrheliometers CH1 used at the BSRN station determined from comparisons with this standard group. These averages are stable in time and the scatter is within  $\pm 0.5\%$  of the mean.



## Since June 2003

(roof platform of the radiation laboratory)

2003

05.06.

Start of measurements on the roof platform

Global radiation (G1):

Global radiation (G2):

Diffuse radiation (D1):

Diffuse radiation (D2):

Direct radiation (I1):

Direct radiation (I2):

Direct radiation (Ir):

Atmospheric

downward radiation (A1): Eppley PIR 32802 F3

Atmospheric

downward radiation (A2): Kipp&Zonen CG4 000517

Kipp&Zonen CM21 010824

Kipp&Zonen CM22 020074

Kipp&Zonen CM22 020073

Kipp&Zonen CM21 010826

Kipp&Zonen CH1 990220

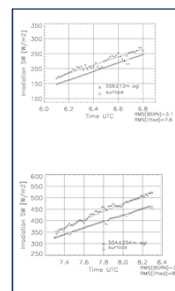
Kipp&Zonen CH1 030340

Eppley AHF 29221

- All radiometers are equipped with Pt-100 or YSI thermistores measuring instrument temperature
- The pyranometer measuring diffuse radiation and the pyrgeometers PIR and CG4 as well as the pyrheliometers CH1 and AHF are mounted on two Kipp&Zonen sun trackers (active tracking system).
- Data are recorded on five data loggers "COMBILOG" by Fa. Th. Friedrichs
- Since June 2003 the AHF has been equipped with a data logger immediately behind the AHF to minimize the distance to the voltmeter

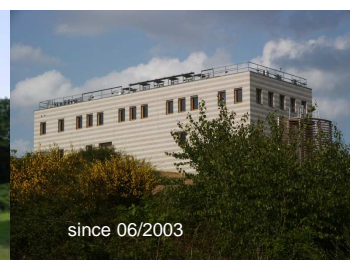
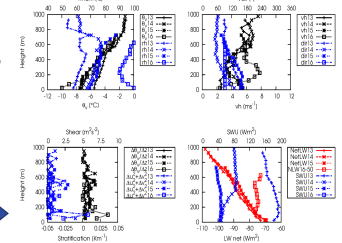
## Balloon-borne irradiation soundings at Lindenberg and Falkenberg

- Pairs of CM21 & CG4 up-/downward looking
- Tethered balloon 9 m<sup>3</sup> as carrier, limited to (all-season) fair weather conditions
- Operation height up to 1000 m, several hours
- Time series and profiles of net radiation and albedo



Estimation of error due to positional variations caused by turbulent wind: for a given clear sky scene the RMS error is doubled compared to surface based BSRN vs. linear fit

Sequence of profiles at 1322, 1444, 1505 & 1624 UT during wintertime, evolution of a boundary layer inversion



Sites of the BSRN Station. Picture (left): the platform in the first phase (1994 to 2001). Picture (middle): the interim platform during the construction of the new radiation laboratory (2001 to 2003). Picture (right): since June 2003 the BSRN instruments have been installed on the roof of the radiation laboratory, at the site of the first platform.

