

## Scintillometer

Instrument name: Scintillometer BLS900

Instrument type: BLS900

Manufacturer: Scintec

Location: Institute for Geoscience, Section Meteorology, Bonn

Coordinates: Lat: 50.73052° N, Lon: 7.071663° E, Alt: 94 m asl

The Scintec scintillometer BLS900 observes small-scale turbulence, and fluctuations in the refractive index of the air in Bonn. These variations can be caused by temperature, humidity, and pressure and can be detected with an optical transmitter and receiver within a specific propagation path.

The propagation path of the scintillometer is installed between the top roof of a high rise building next to the Section Meteorology, Institute for Geoscience, University of Bonn, and its second component on the south east tower of the University of Bonn main building in the city center of Bonn. This results in a total propagation path of approx. 2.15 km through the Bonn urban area.

## Instrument specifications

Parameter	Specification
<b>Transmitter</b>	
Manufacturer	Scintec
Instrument type	BLS900
Main radiation source	888 GaAlAs LEDs
Degradation time MTTF	55000 hours
Auxiliary radiation source	36 LEDs
Maximal optical power	15 W
Wavelength	880 nm
Beam divergence	16°
Pulse repetition rate (PRR)	1 Hz, 5 Hz, 25 Hz, 125 Hz
Pulse length	8 ms
Modulation frequency	1750 Hz and 2500 Hz
Operation Voltage	12 VDC
Power consumption	80 W 16 W 4 W 1 W
Dimensions	364 x 180 x 135 mm
Weight	8.5 kg

<b>Receiver</b>	
Receiver Lens	Plan convex
Focal length	450 mm
Diameter	145 mm
Field of view	8 mrad
Detectors	2 Si Photodiodes
Sensitive area	15 mm <sup>2</sup> and 5 mm <sup>2</sup>
Dimension	Ø 160 x 590 mm
Weight	7.6 kg
<b>BLS SPU</b>	
Integration time	1 min
Data storage capacity	Approx. 2 years
Internal clock	Date and time
Operation temperature range	- 20 °C - + 50 °C
Operation Voltage	12 VDC
Weight	4.7 kg
Dimension	230 x 200 x 180 mm
Power consumption (incl. receiver)	15 W

## Instrument time-line

12/03/2004 – 29/05/2008	Propagation path between: high rise building next to Section Meteorology, Institute for Geoscience, University of Bonn, Bonn – south west tower, main building University of Bonn, Bonn
03/10/2009 – today	Propagation path between: high rise building next to Section Meteorology, Institute for Geoscience, University of Bonn, Bonn – south east tower, main building University of Bonn, Bonn

## Available measurement modes

- 1 min measurement intervals with extended data
- Change of propagation path (only for long term observations)

## JOYCE-CF Standard Operation Procedures

- Continuous operation at fixed propagation paths between: high rise building next to Section Meteorology, Institute for Geoscience, University of Bonn, Bonn – tower of main building University of Bonn, Bonn (changes in towers, only due to constructions)
- 1 min measurement intervals

## Data quality assurance procedures

- Raw data provided by the instrument. Quality control by operator.

## Available datasets

Data can be requested via the 'Messdatenportal' (<https://www.ifgeo.uni-bonn.de/abteilungen/meteorologie/messdaten/messdatenportal>).

Additional data, measurement time, or instrumentation can be requested via the JOYCE-CF request sheets.

### Level 1

- Available Data:
  - Structure function constant of temperature fluctuations  $CT^2$  in  $K^2/m^{2/3}$
  - Sensitive heat flux  $H$  in  $W/m^2$
  - Crosswind in m/s
- Data format:
  - Temporal resolution: 1 min
  - CSV download as requested
  - File size approx. 700 kB per day

## Contact

### Josephin Beer

University of Bonn  
Institute for Geoscience  
Section Meteorology  
Auf dem Hügel 20  
53121 Bonn, Germany  
Tel.: +49 (0)228 73-3152  
E-mail: [jbeer@uni-bonn.de](mailto:jbeer@uni-bonn.de)