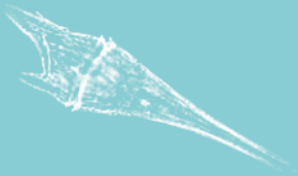




FluoroProbe



Submersible Spectrofluorometer for Algae Class and Chlorophyll-a Analysis

Yellow Substances and automatic Turbidity Correction



FluoroProbe –
a highly sensitive measuring
instrument

Get to know your water ...

The bbe FluoroProbe is a highly sensitive instrument for the analysis of microalgae in the water. The submersible FluoroProbe quickly and reliably determines chlorophyll-a concentrations in situ and in real time by fluorescence measurement. Recorded data are displayed online or stored internally. The FluoroProbe discriminates algae classes even in complex mixtures due to the spectral properties of green algae, blue-greens (cyanobacteria), brown algae consisting of diatoms, dinoflagellates, chrysophytes, and cryptophytes. The use of the FluoroProbe replaces a considerable amount of laborious analytical work in the lab.



1000 m depth version

Minimum set-up – maximum precision

- 'Click and Go'
- No sample preparation
- Autostart with plug-in
- Pre-adjustment of algae classes
- Measurements according to HPLC-pigment analysis
- Best fit for composite algae mixtures

Utilisation

- Water monitoring for cyanobacteria
- Analysis of bathing water for harmful algae
- Early Warning System
- Ocean research
- Limnological research
- Ecological education
- Supervision of aquaculture

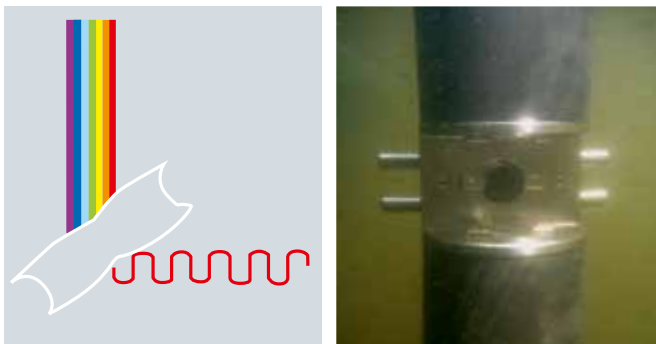


In situ profiling with algae class distinction

The principle

Fluorescence is a common phenomenon of algae and plants due to excitation by visible light. The ubiquitous pigment chlorophyll-a is mainly responsible for the red light emission. Accessory pigments close to chlorophyll-a affect fluorescence leading to typical excitation spectra of taxonomically diverse algae classes. These spectral “fingerprints” are extensively analysed and used to quantify algae from different classes.

To achieve a complete fluorescence response, the excitation light ranges from UV to red light. The fingerprints of four algae classes are already stored in the FluoroProbe: mathematical algorithms are used to calculate real algae concentrations of natural samples. Additional fingerprints can be added.

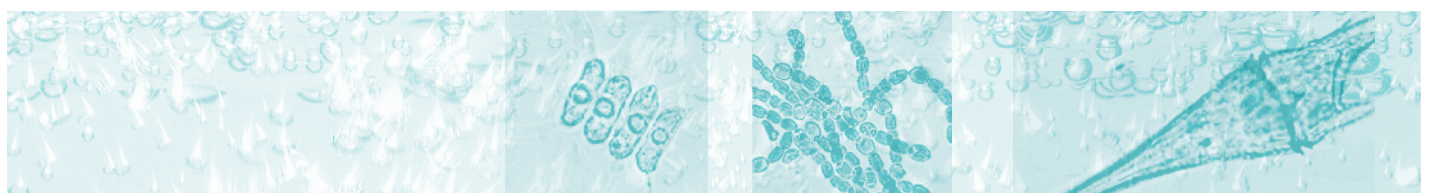


Yellow Substances (YS)

Decay of organic matter in natural waters results in coloured dissolved organic matter (CDOM) partially with fluorescent properties – the Yellow Substances (YS). YS can interfere with the chlorophyll determination with drastic effects at low chlorophyll concentrations. The YS spectra, stored in the FluoroProbe, are used for YS correction.

Turbidity correction

The occurrence of particulate matter which absorbs light causes turbidity and leads to reflectance. At higher concentrations, turbidity affects chlorophyll analysis. With the optional transmission measurement the bbe++ software automatically corrects turbidity effects and prevents chromic shifts of algae classes. The automatic correction is a unique feature of bbe fluorometers.



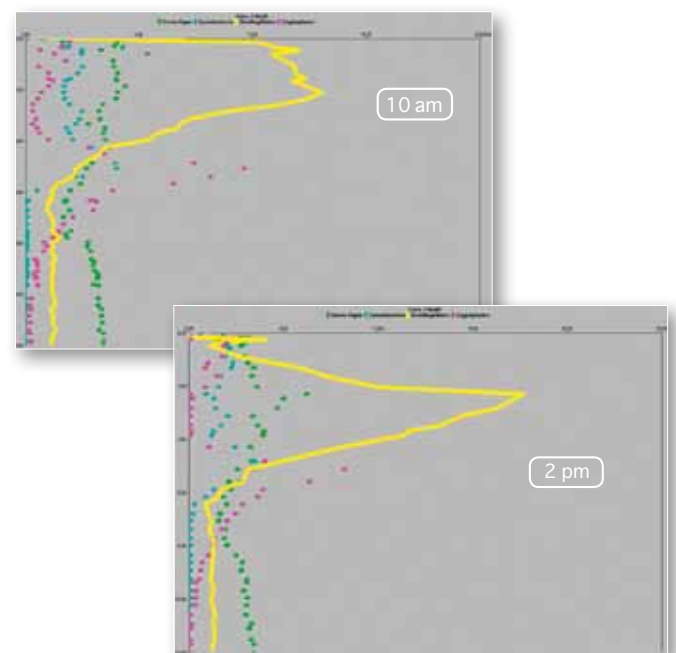
The bbe++ software of the FluoroProbe provides detailed data analysis

The bbe++ software controls all the FluoroProbe functions, initiates measurements and accumulates the results. These can be shown either as a table or a graph. Further processing allows printing, data export or comments.

A refit is an additional feature for recalculation with customised fingerprints. Also, parameter setting changes and calibration can be performed using the bbe++ software. To ease handling, 2 levels are selectable: basic and advanced functionality.

Example for a FluoroProbe profiling

The screenshots show distribution profiles recorded at the same location at 10 am and 2 pm in Lake Plussee (Germany). Clearly a migration from the surface downwards is shown. Dinoflagellates were dominant.



Profiles from lake Plussee at 10 am and 2 pm (same place)

The dinoflagellates had moved downwards in water layers with higher nutrient concentrations. Their maximum concentration was found at 3 m depth, whilst the other algal groups did not migrate. The peak of cryptophyta remained stable at 5 m depth throughout the entire day.

The FluoroProbe Bluetooth bundle

This accessory kit for the FluoroProbe consists of bbe Bluetooth adapter for the FluoroProbe, a latest smartphone and the bbe FluoroProbe application. The FluoroProbe application is already installed and enables quick and easy start-and-go. Data and parameters are transferred via BlueTooth between the smartphone and the FluoroProbe.



Workstation 25

Features

- determination and quantification of different algae classes within seconds by in situ measurement
- automatic turbidity and yellow substances correction
- rechargeable battery for standalone measurements
- internal data logger
- bbe++software for data analysis

Specifications FluoroProbe

Measurands	total chlorophyll [$\mu\text{g chl-a/l}$] and algae classes
Measuring range	0 - 200 $\mu\text{g chl-a/l}$
Measurement procedure	spectral fluorometry
Resolution	0.01 $\mu\text{g chl-a/l}$
Transmission	0 - 100%
Water temperature	-2 to 40°C
Housing material	reinforced carbon fibre/V4A steel
Weight	4.5 kg in the air
Dimensions (H x D)	450 x 140 mm
Voltage	12 V
Battery capacity	3900 mAh
Operating time	10 h @ 1 measurement per second or 30 days maximum @ 1 measurement per day
Memory capacity	10 million datasets
Interface	RS485 incl. USB-adapter
Maximum diving depth	0 - 100 m 0 - 300 m (extended range 1) 0 - 1000 m (extended range 2)
Options	Workstation 25 (cuvette device) Transmission measurement Temperature measurement Bluetooth kit including smartphone and bbe app 2, 10, 20, 50, 100 m cables Flow-Through Unit Hydro-Wiper Protective Cage

Subject to alteration!



The cleaning device Hydro-Wiper for long-term deployment

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