

# Mini Workshop 1

## Chlorophyll fluorescence as a popular tool to study the physiological status

### Conveners

Bernard Lepetit, Jacco Kromkamp

### Workshop description

Chlorophyll fluorescence measurements, either via the PAM or the FRRF technique, are frequently used to study the physiological state of algae under varying conditions. If correctly applied, these techniques provide a wealth of important information about the photosynthetic activity, as well as the physiological state of the alga, and can potentially be used to derive primary productivity. However, often only the parameter  $F_v/F_m$  is used. In order to exploit the full potential of fluorescence based techniques, we will explain the different parameters and how to obtain them technically correct in the first part of the workshop. Potential pitfalls will be highlighted and some examples of specific applications will be provided. In the second part of the workshop, several experts will present their latest research results referring to photosynthesis in general, obtained via fluorescence based as well as other sophisticated techniques. For the third part applications for a 15 min talk (which includes 3 min discussion) covering the topic are very welcome.

### Program:

#### 1. part:

*Bernard Lepetit* (25+5 min)

Pulse amplitude modulated (PAM) fluorometry: The measurement principle, the parameters, the relation to electron transport rates and its use to study Non-Photochemical Quenching (NPQ)

*Jacco Kromkamp* (25+5 min)

Fast Repetition Rate Fluorometry (FRRF): what does it measure, relationships between optical and functional absorption cross section and can we derive primary production from absolute electron transport rates?

#### 2. part:

· *Ondrej Prasil* (15+5 min): GPP, NPP and assumptions regarding robustness of  $K_a$  (which is required to calculate  $[RCII]$  and  $aLHII$ ): how constant is  $K_a$ , thus  $K_P/K_F$  in conditions of unbalanced growth

· *Scarlett Trimborn* (15+5 min): Photophysiological strategies to iron limitation and high light differ between two Antarctic key phytoplankton species

· *Benjamin Bailleul* (15+5 min) Combining fluorescence and Joliot type spectrometry to quantify the redox reactions of the photosynthetic electron transport chain in algae

3. part: Four talks 12 min +3 min discussion. Applications are welcome.