

FAST AND NON-SEQUENTIAL MEASUREMENT METHOD FOR THE LIGHT RESPONSE OF CHLOROPHYLL α FLUORESCENCE



TECHNOLOGY SUMMARY

New method for the measurement of the *in vivo* emission of chlorophyll α fluorescence by photosynthetic organisms, through the generation of light-response curves with independent observations, measured in a non-sequential and much faster way than the existing methods. The method combines the (i) projection in the sample of spatially separated light beams of different intensity or quality, using a digitally-controlled projector, with (ii) the measurement of the emitted fluorescence as a response to each light beam using an image fluorometer.

BENEFITS

NON-SEQUENTIAL MEASUREMENTS

TEMPORALLY-INDEPENDENT MEASUREMENTS

MUCH FASTER than the established methods.

HIGH FLEXIBILITY: to define and control the range of light intensity and color applied to the samples.

CONTEXT

The measurement of the *in vivo* emission of chlorophyll α fluorescence using a type of instrument called “pulse modulation amplitude fluorometer” is a technique widely used in fundamental and applied studies on the photosynthetic activity of plants, lichens, algae and other photosynthetic organisms. One of the most commonly used methods consists in the measurement of “light response curves”, based on the quantification of fluorescence emission of a sample exposed to different levels of light intensity.

The methods currently used are affected by two main problems: they are time consuming and based on independent measurements. This technology enables the construction of light response curves consisting of independent measurements in a much faster way than any previously described method.

APPLICATIONS

Method to be used as a modular component to couple to fluorometry imaging systems, with several applications in photosynthetic organisms:

EVALUATION OF PHYSIOLOGIC STATES

PREDICTION OF VARIATIONS IN PHOTOSYNTHETIC EFFICIENCY UNDER DIFFERENT LIGHTNING CONDITIONS

IDENTIFICATION AND SELECTION OF VARIETIES WITH HIGHER PHOTOSYNTHETIC EFFICIENCY

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IP RIGHTS

National patent granted.

DEVELOPMENT STAGE

TRL 4: tested in laboratory and available for presentation.

The method was extensively tested in a wide variety of samples and measurement conditions. Protocols and operating parameters were defined enabling to guide the development of new equipment (Serôdio et al. 2013 Plant Physiology).

KEYWORDS

CHLOROPHYLL α FLUORESCENCE

PULSE AMPLITUDE MODULATION (PAM) FLUOROMETRY

LIGHT CURVES

DIGITAL PROJECTOR

LIGHT MASK



DEVELOPED BY

Researchers of Centre for Environmental and Marine Studies (CESAM) of the University of Aveiro.

BUSINESS OPPORTUNITY

License agreement.

Joint further development.

Testing of new applications.

Adaptation to specific needs.

CONTACT

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PARTNERSHIP

The University of Aveiro seeks partners within the sector of electronic equipment development and manufacture, as well as other universities and research institutes.