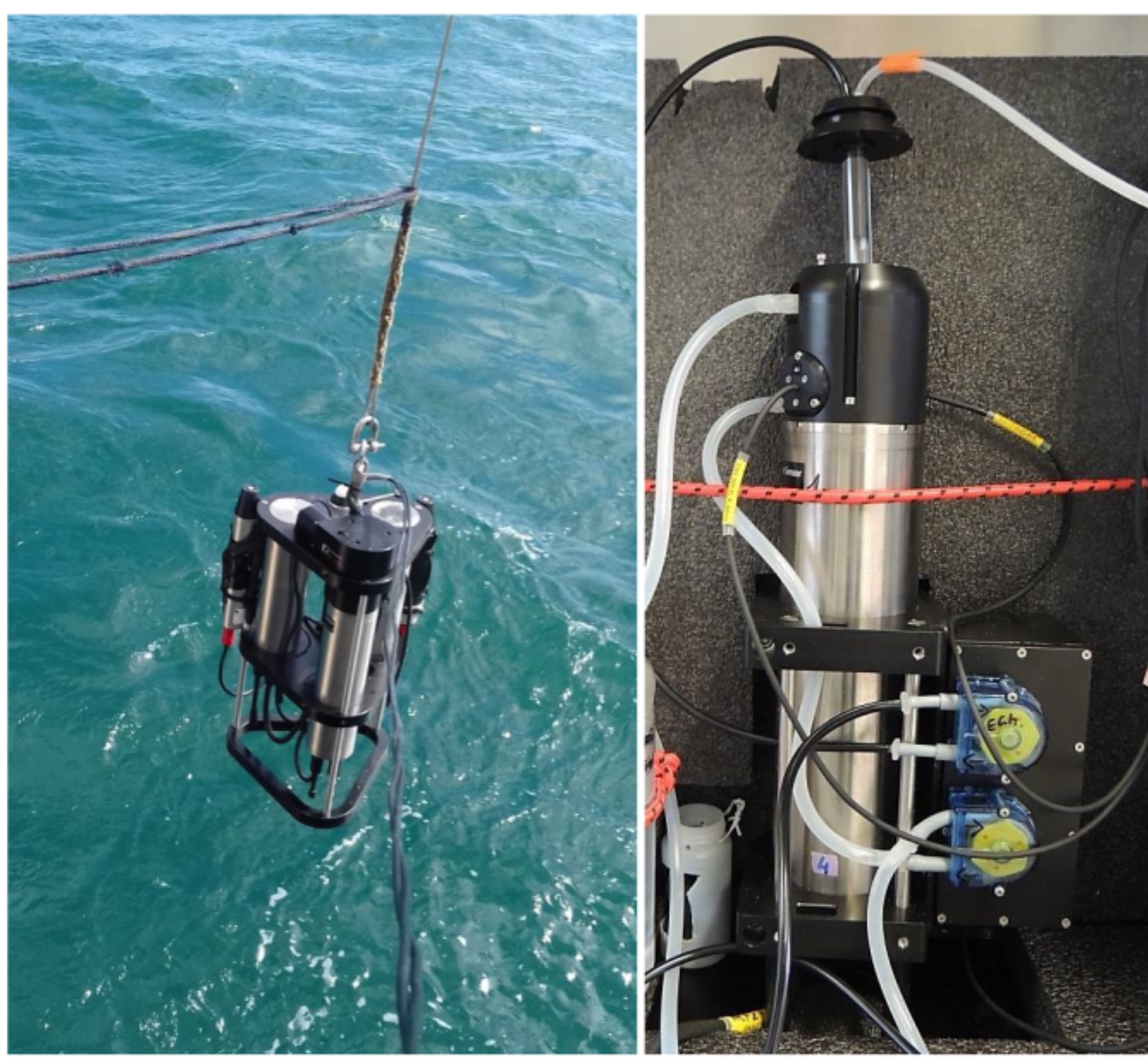


1. Introduction

The current measurement tools of the primary production of microalgae are based on the measurement of the variable fluorescence (FV, or active fluorescence) of the molecules of Chlorophyll-a in photosystems II. This technique allows to determine the photosynthetic parameters necessary to estimate the primary production capacity of microalgae in areas of interest and/or sensitivity of coastal ecosystems.[1]

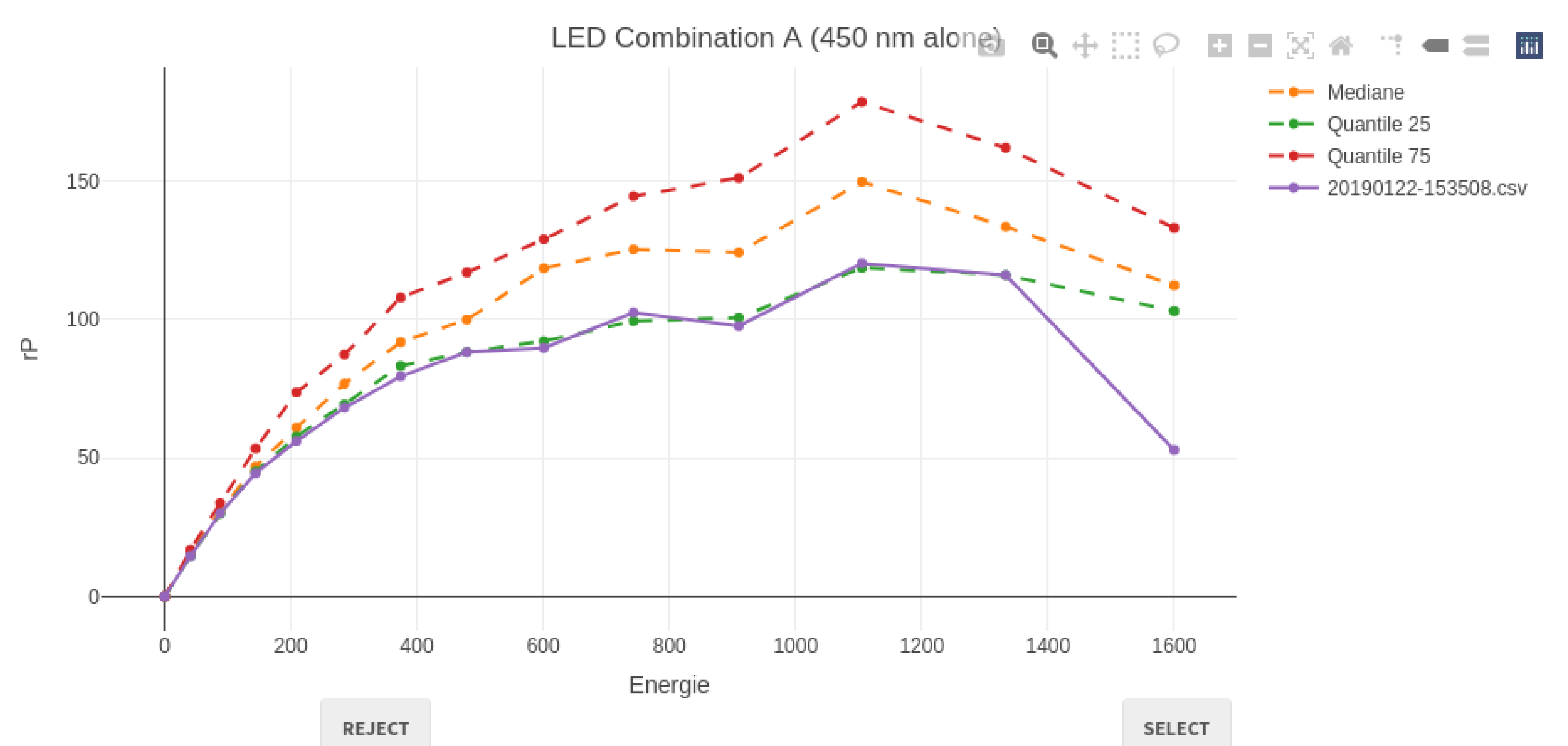
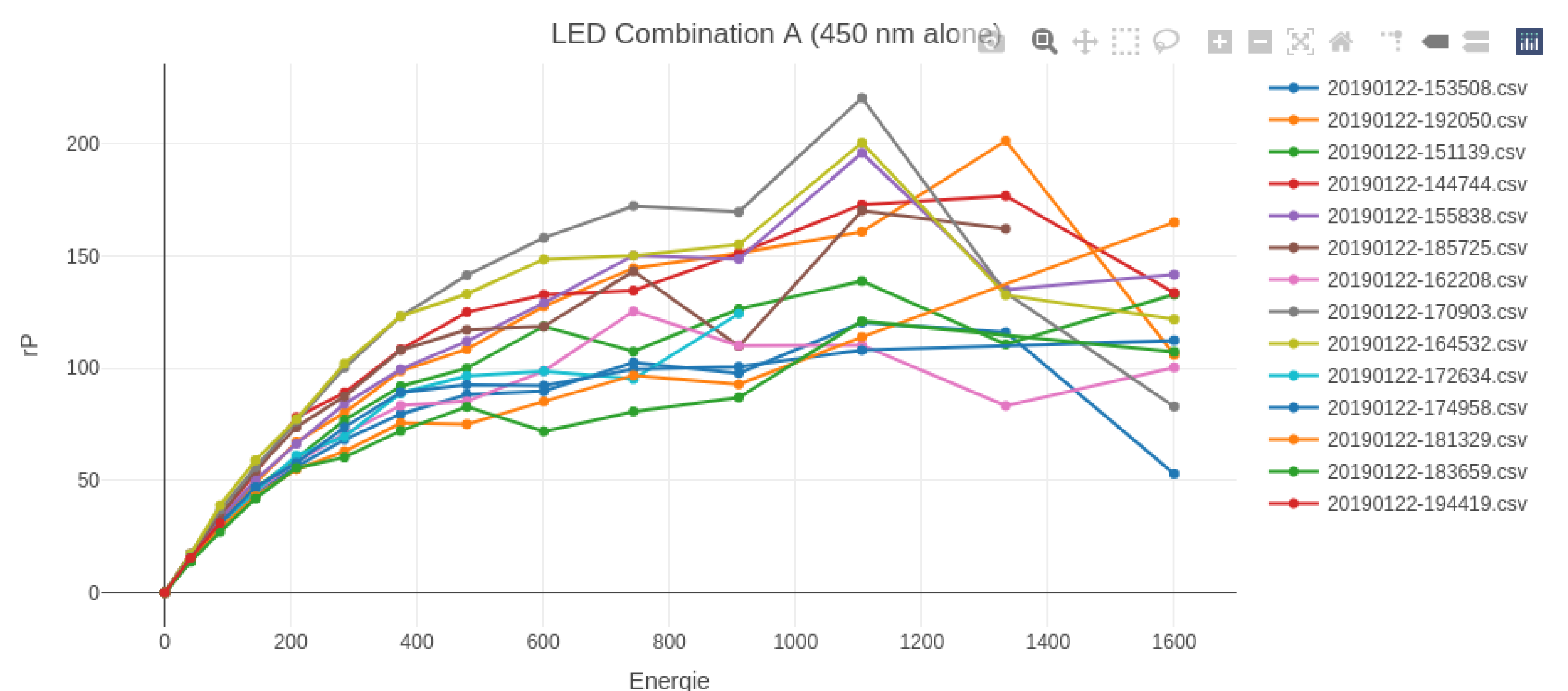
2. Objective

The aim of our application developed in R Shiny is to provide an open-source, rapid analysis tool for FRRf Act2 Run data relative to the photophysiology of microalgae [2]. Our application will allow to visualize, correct and extract parameters from the collected data.



3. How does the application work ?

First, the biologist can visualize the curves of his acquisitions according to the different parameters. Then comes the automatic correction phase. At this level, a first sorting of the data is made according to different criteria: number of E excitations, presence of a plateau, etc... We can also allow the user to validate or not the corrections made. The PE curves obtained by FRRf Act2 Run [3] are then adjusted by the equation of Eilers and Peeters (1988) to determine the slopes (photosynthetic efficiency α) and the maxima (photosynthetic capacity rETR max) as well as the parameter Eop corresponding to the optimal energy of electron transfer.



4. References

- [1] Hedy M. Aardema Machteld Rijkeboer Alain Lefebvre Arnold Veen and Jacco C. Kromkamp. High-resolution underway measurements of phytoplankton photosynthesis and abundance as an innovative addition to water quality monitoring programs. *Ocean Science*.
- [2] Fabrice Lizon. Apports de la fluorescence variable fv de type frf (fast repetition rate fluorometer), sur la caractérisation biologique des masses d'eau (campagnes 2017-2019). *ResearchGate*, 2020.
- [3] Kevin Oxborough. Act2run software and act2 system. *J. Chem. Inf. Comput. Sci.*, 2018.

5. Conclusions

The studied data are of interest in the framework of programs dedicated to ecological monitoring or long-term observation of ecosystems. Our Web application will provide via an adaptation of the R package Phytotools, a metafile that will be easily exploitable and made available to the community on SENA OE.[2]

Partners