

Diel variations of the optical properties of oceanic phytoplankton - Preliminary results

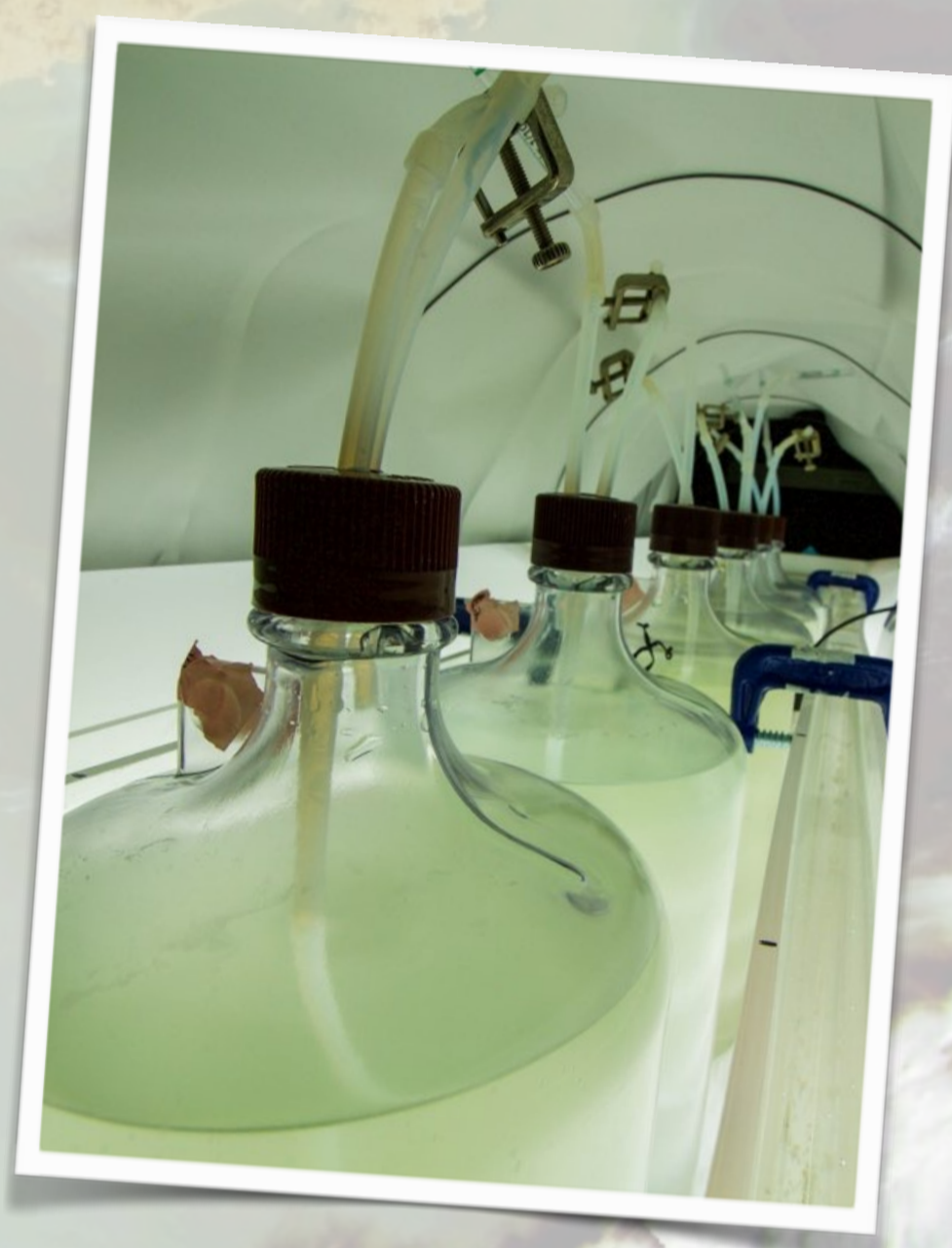
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Introduction

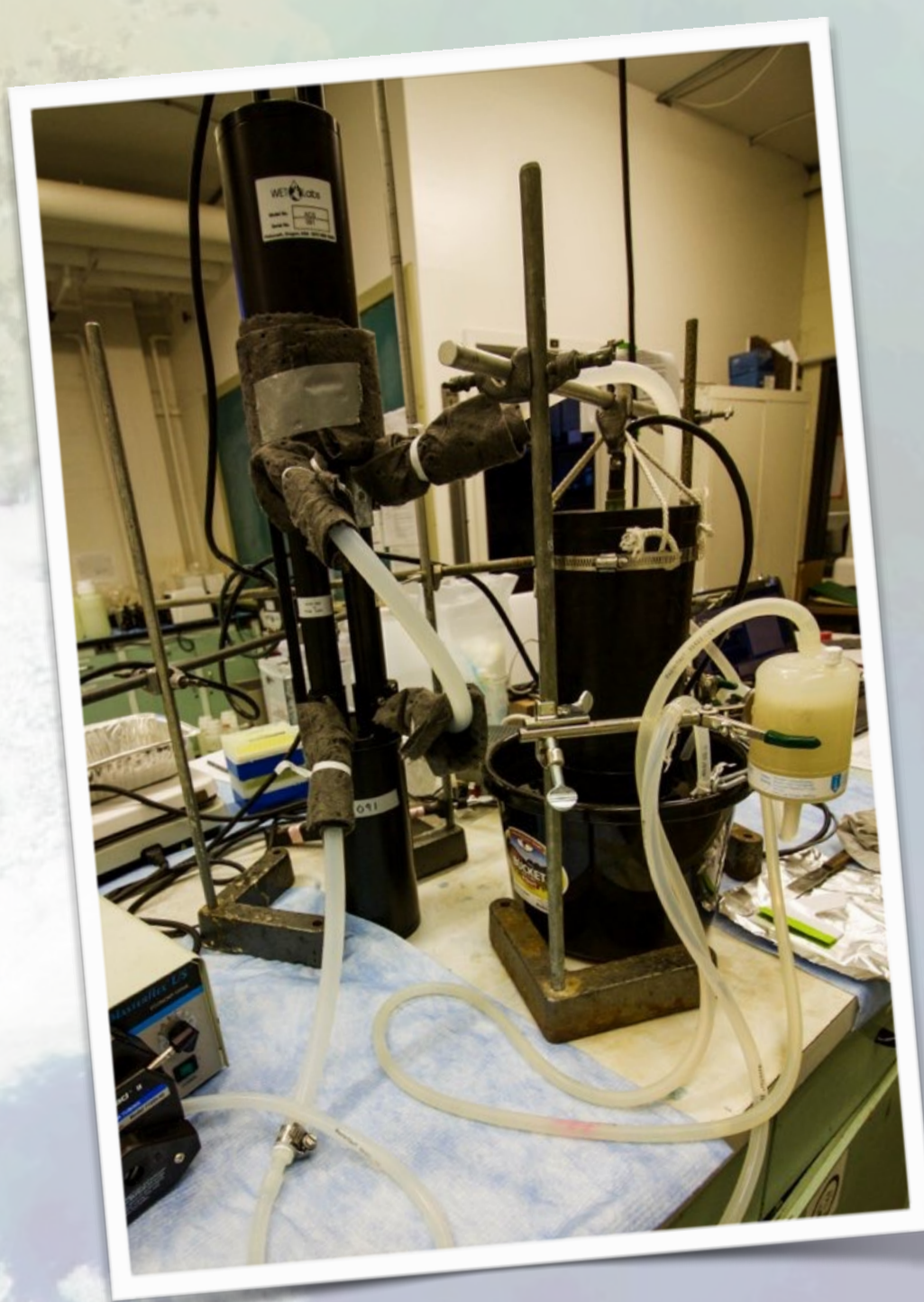
With the recent development of geostationary satellites equipped with ocean color sensors and the increasing availability of moored sensors, temporal resolution of ocean color data is higher than ever. This allows the investigation of diel variations of phytoplankton ecology and physiology from in situ and space potentially providing new insights into growth and physiology. This study aims to characterize the diel variations of phytoplankton optical properties and possible covarying factors in the lab, to understand what can be observed *in situ* and from space.

Materials and Methods

- 4 species
- 3 - 4.2 L semi-continuous cultures per species
- «Realistic» illumination with light intensity mostly following a sinusoidal curve during the day and no light at night
- Max PAR at midday in cultures : 400 $\mu\text{mol photons/m}^2$
- Temperature maintained at 19°C

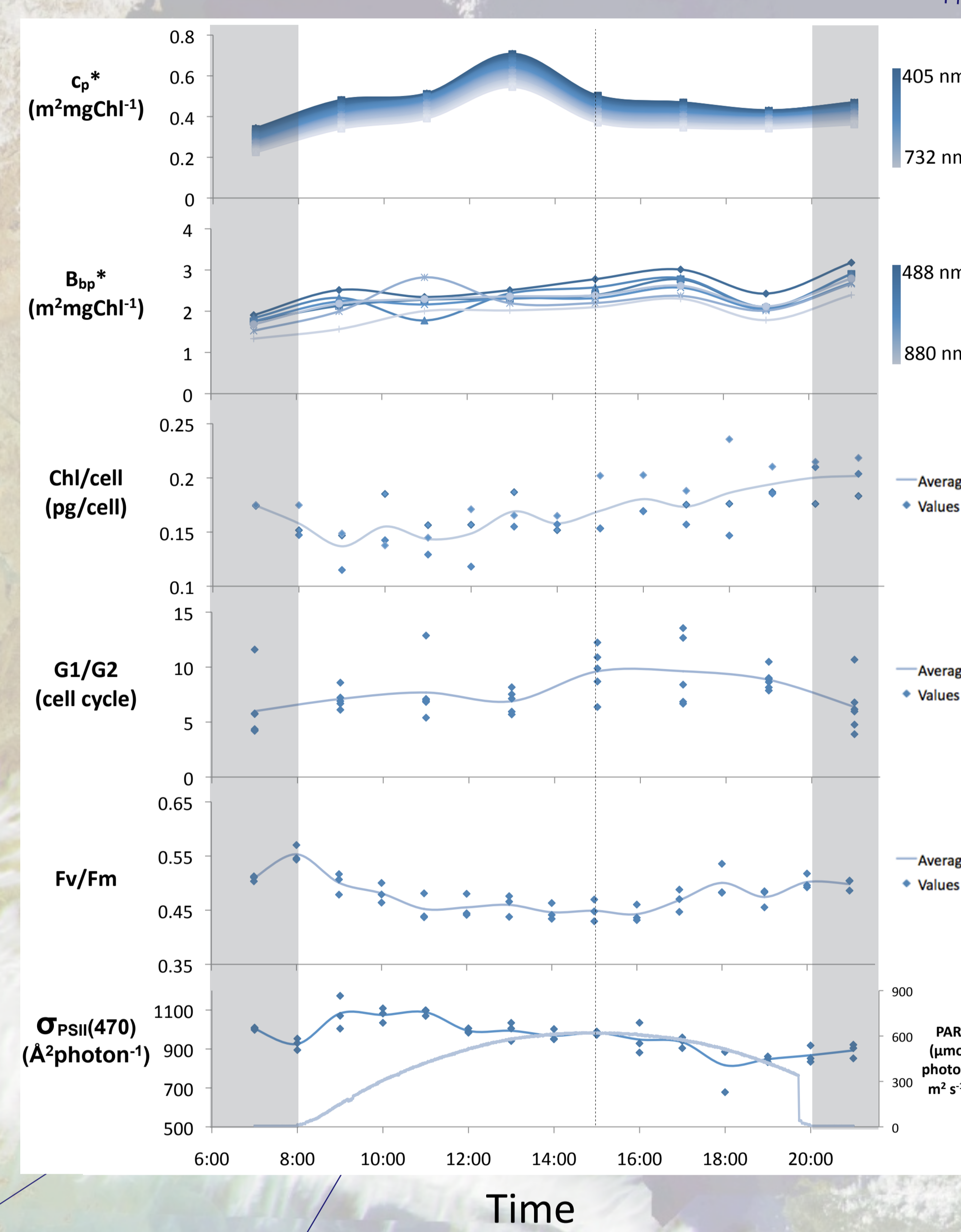
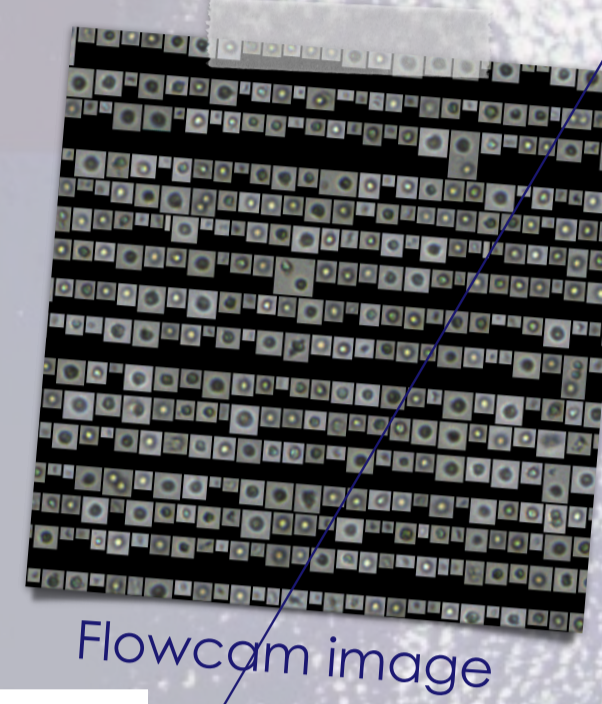


- 1 sampling day per species every hour from 7 am to 9 pm
- 7 time point with reduced dataset
 - Cell counts (Coulter Counter)
 - Chla (Turner fluorometer, N-A method)
 - Flow cytometry samples (ethanol fixation)
 - Flowcam
 - Fv/Fm (FRRF fluorometer, Soliense)
- 8 time points with complete dataset every two hours, including all samples from the reduced dataset and :
 - Optical measurements (b_{bp}^* from a BB9 (Wetabs Inc.) and c_p^* from an ACS (Wetabs Inc.))

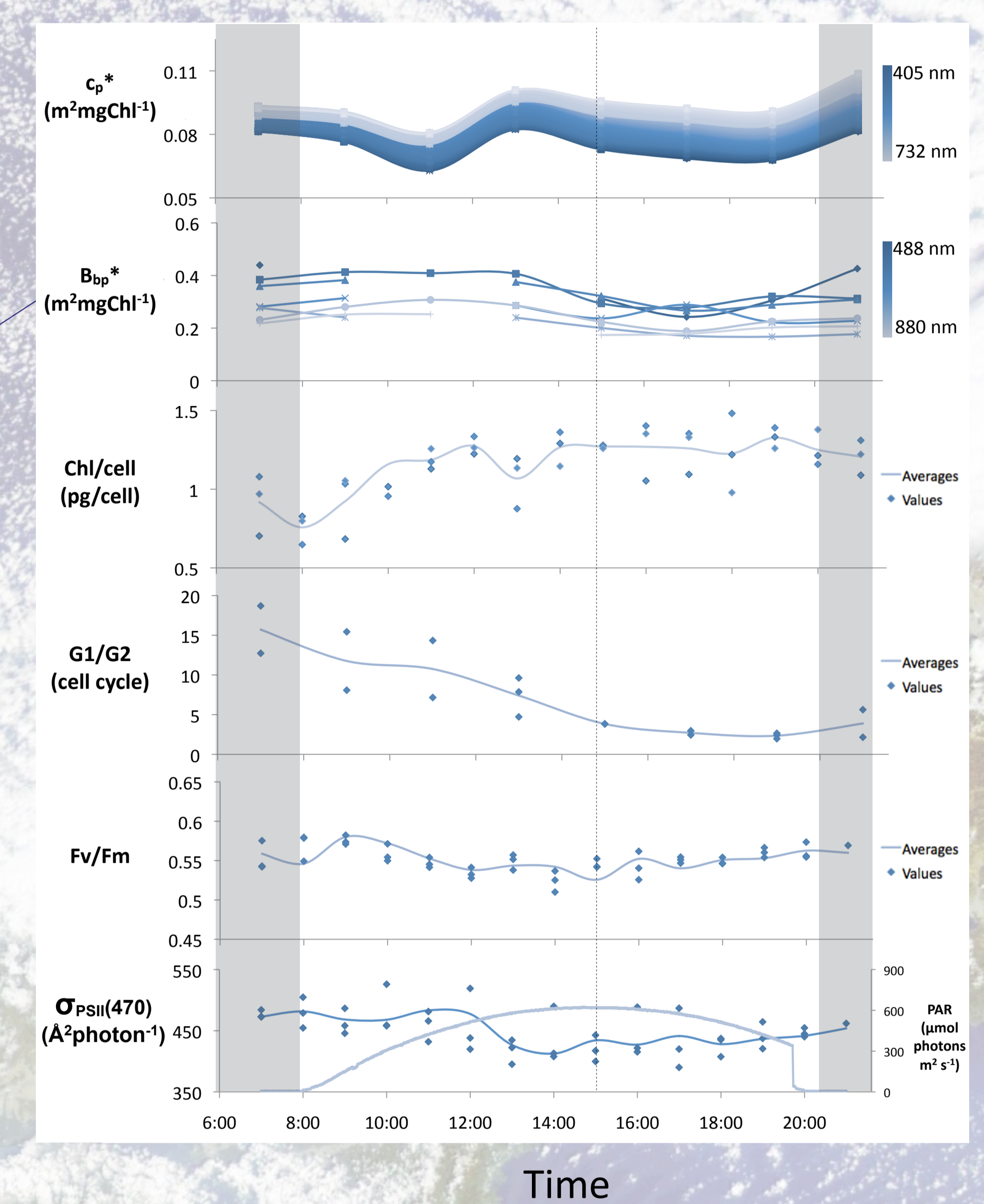
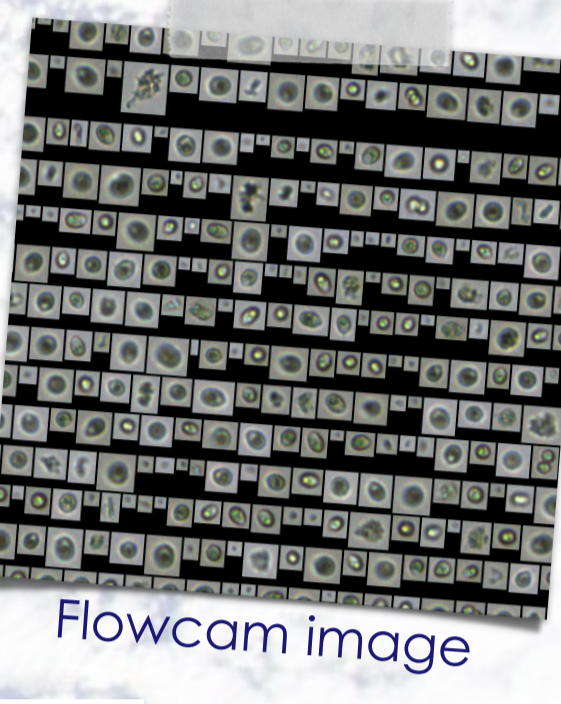


Results

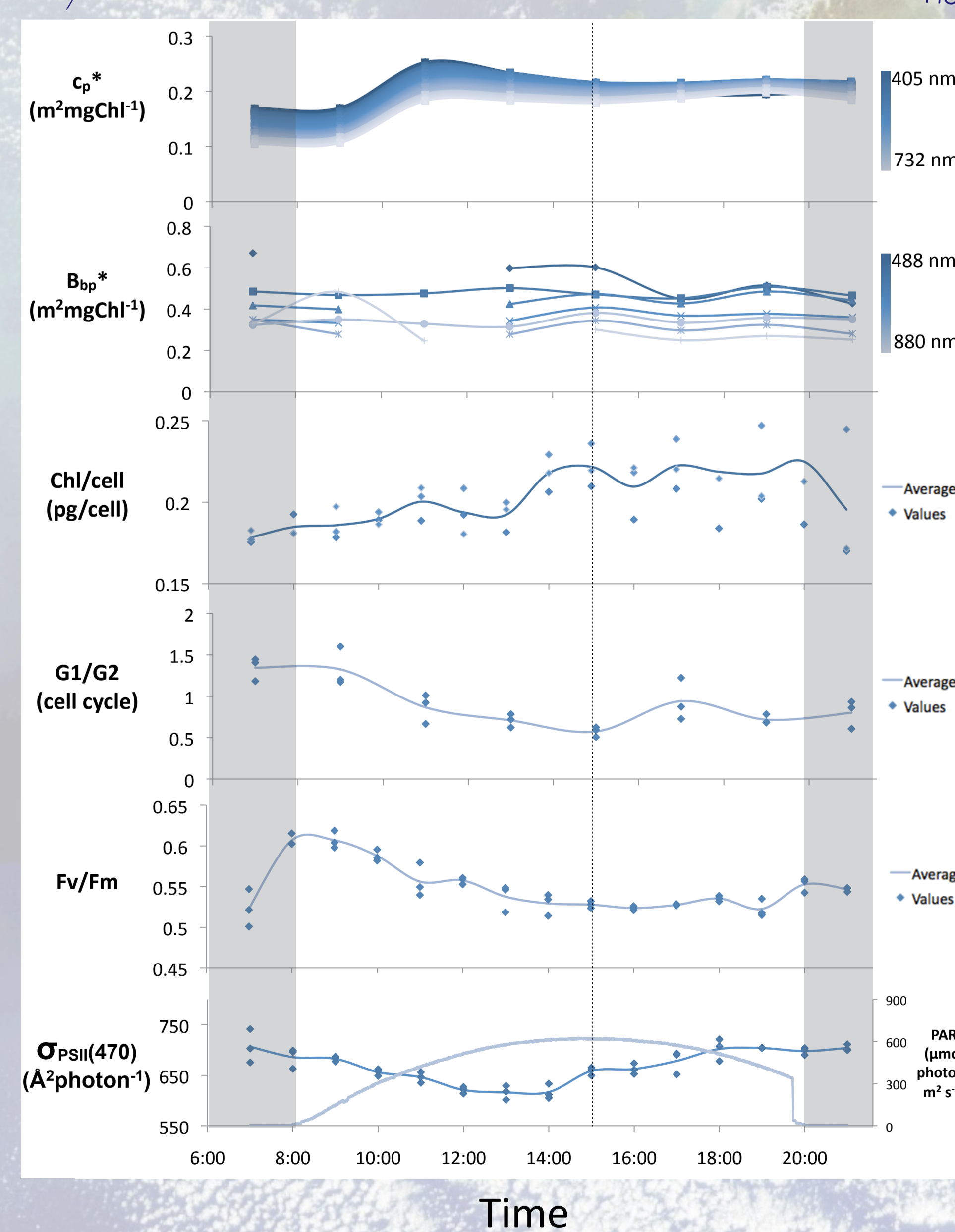
E. Huxleyi (cocolithophore)



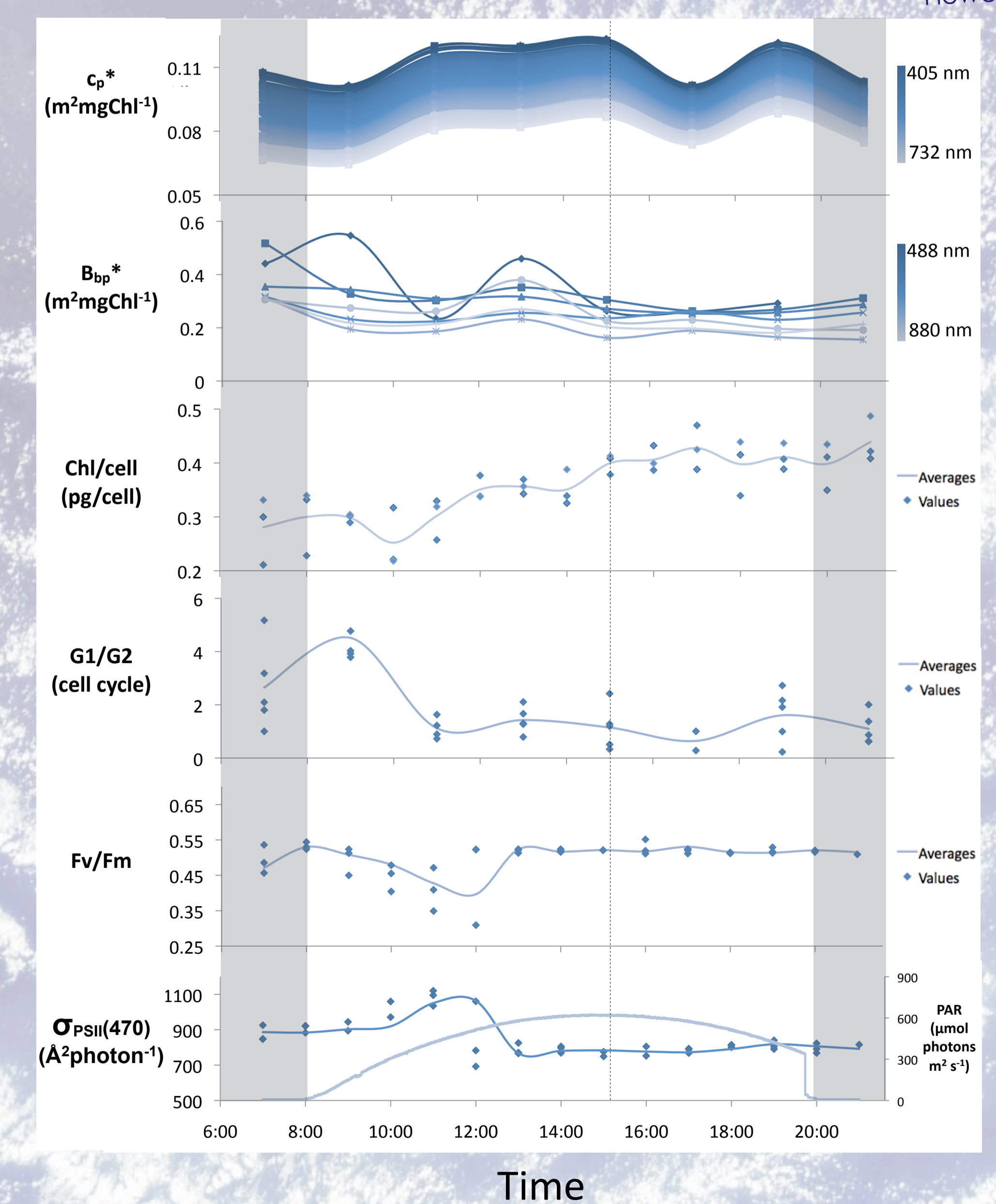
D. Tertiolecta (green algae)



T. Pseudonana (diatom)



P. Tricornutum (diatom)



Discussion and conclusion

We did not observe clear diel variations for b_{bp}^* , but some changes in c_p^* . This poster presents only preliminary results, further analyses are planned with additional measures to understand more deeply these results.

This work is part of a PhD project which will compare the results obtained in this lab experiment with in situ data and eventually GOCI data.

Acknowledgments

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Background image: Geostationary Ocean Color Imager (GOCI) Satellite, Korea Ocean Satellite Center (KOSC).

