



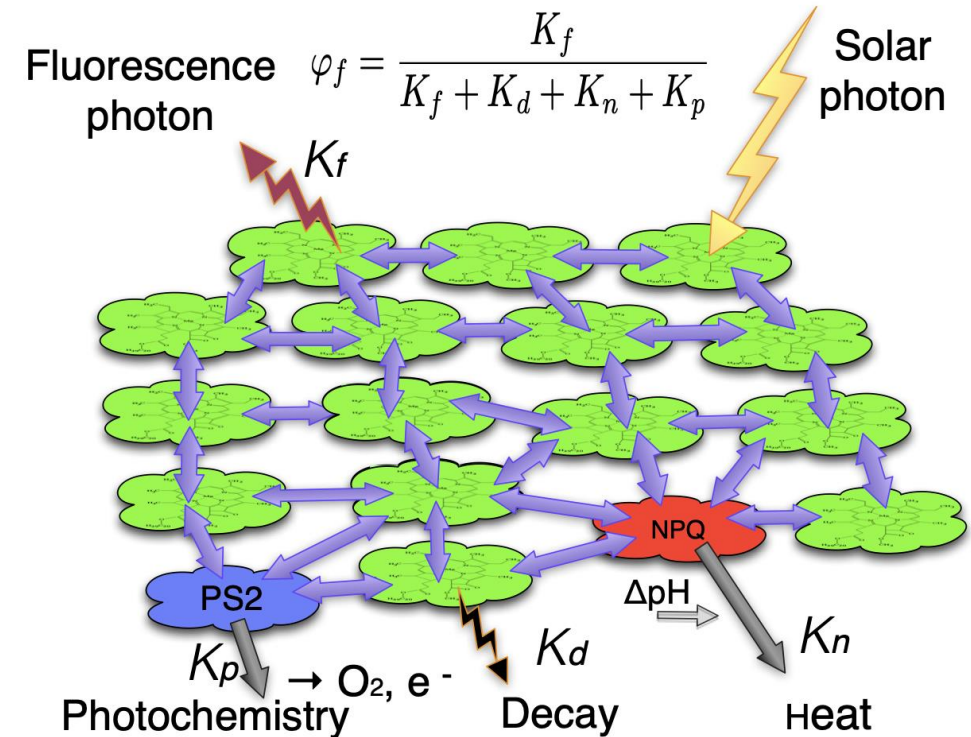
BAYFLUOR: A Bayesian Full-Spectrum Fluorescence Retrieval (for PACE)

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Co-I Suniti Sanghavi (JPL, RT expert)
Coll. Zachary Erickson, Kelly Luis,
Michelle Gierach (Ocean Experts)

Introduction to Solar Induced Chlorophyll Fluorescence

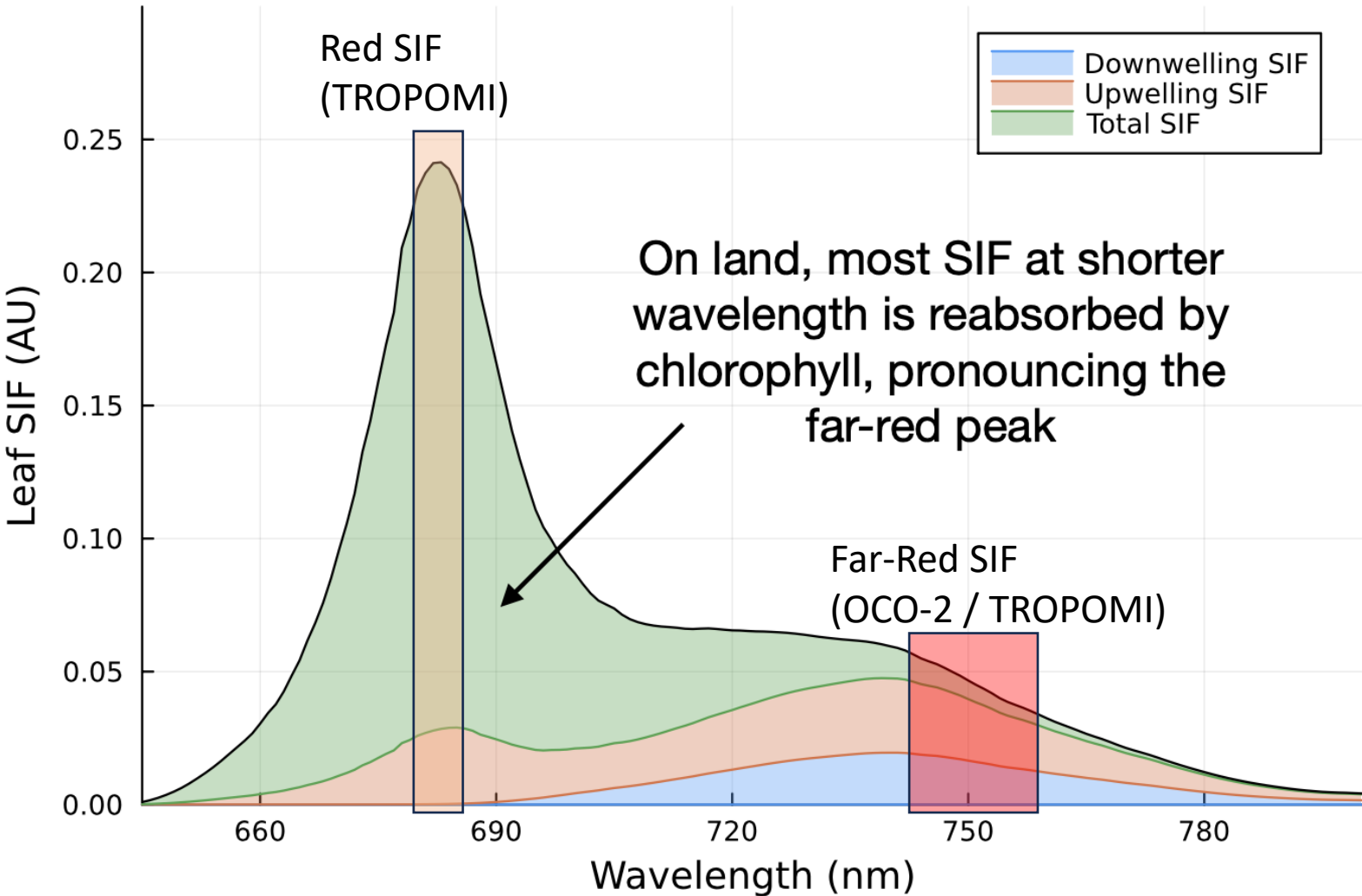
Same for Land and Ocean

- During photosynthesis, a small fraction of energy is reemitted as light (fluorescence).
- Remote sensing instruments include a measurement region that reveals this signal.
- This measurement is more directly tied to plant health and activity than traditional measurements like greenness.

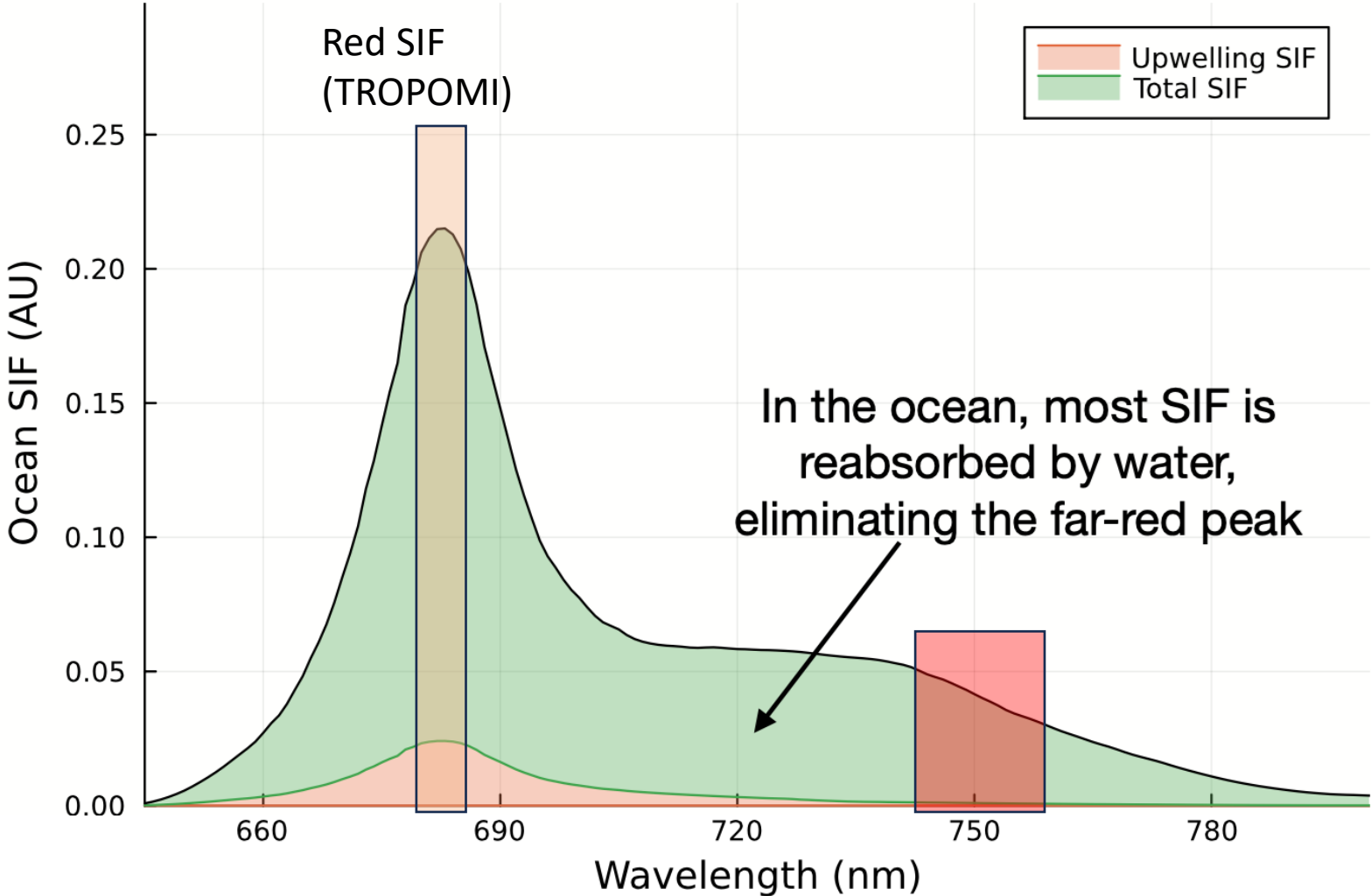


from Frankenberg, Berry, Guanter, Joiner (2012)

What is emitted at the chloroplast vs. what we see from space
(How can we compare **Total SIF** ($\mu\text{mol}/\text{m}^2/\text{s}$) over land and ocean?)

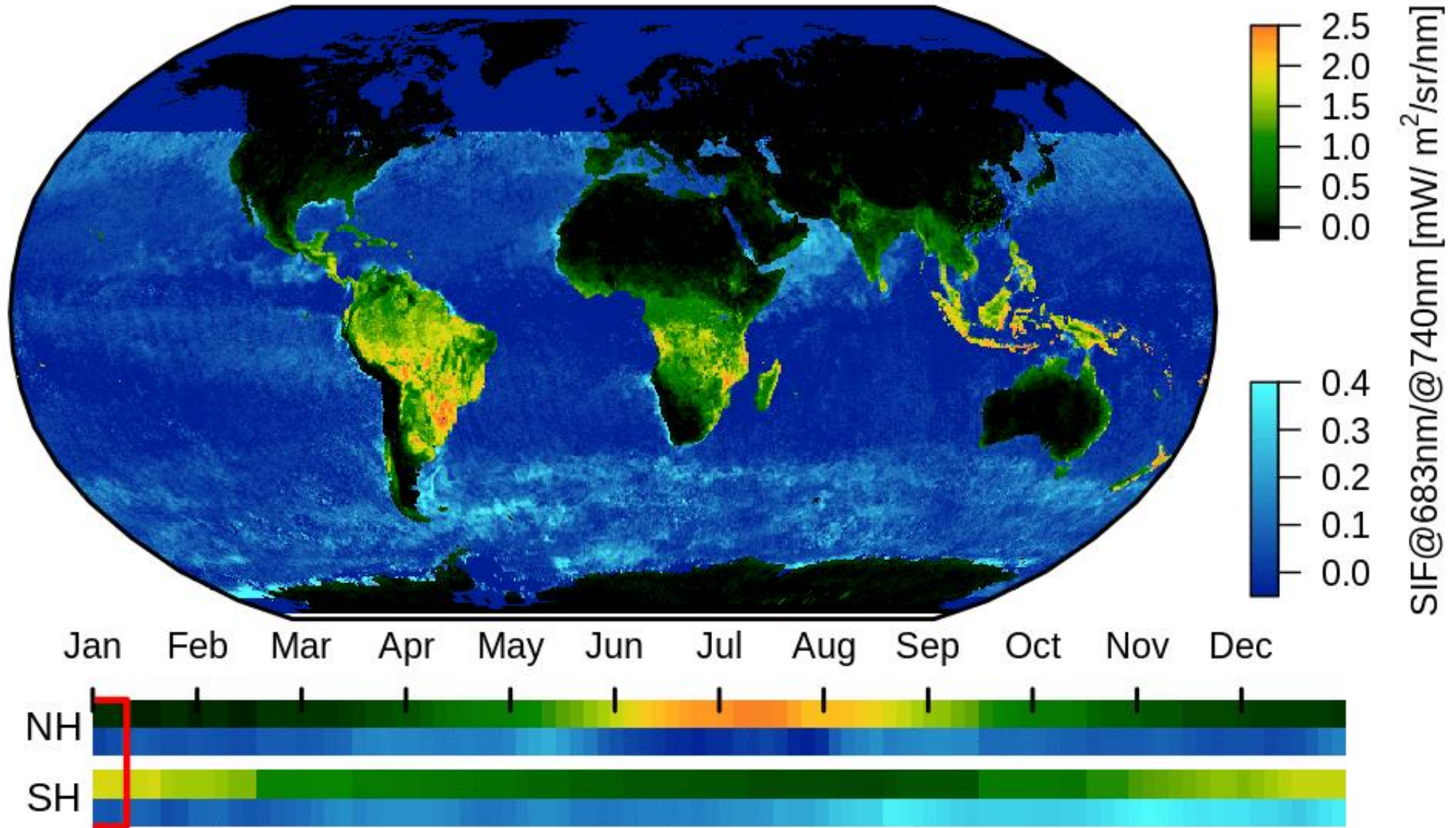


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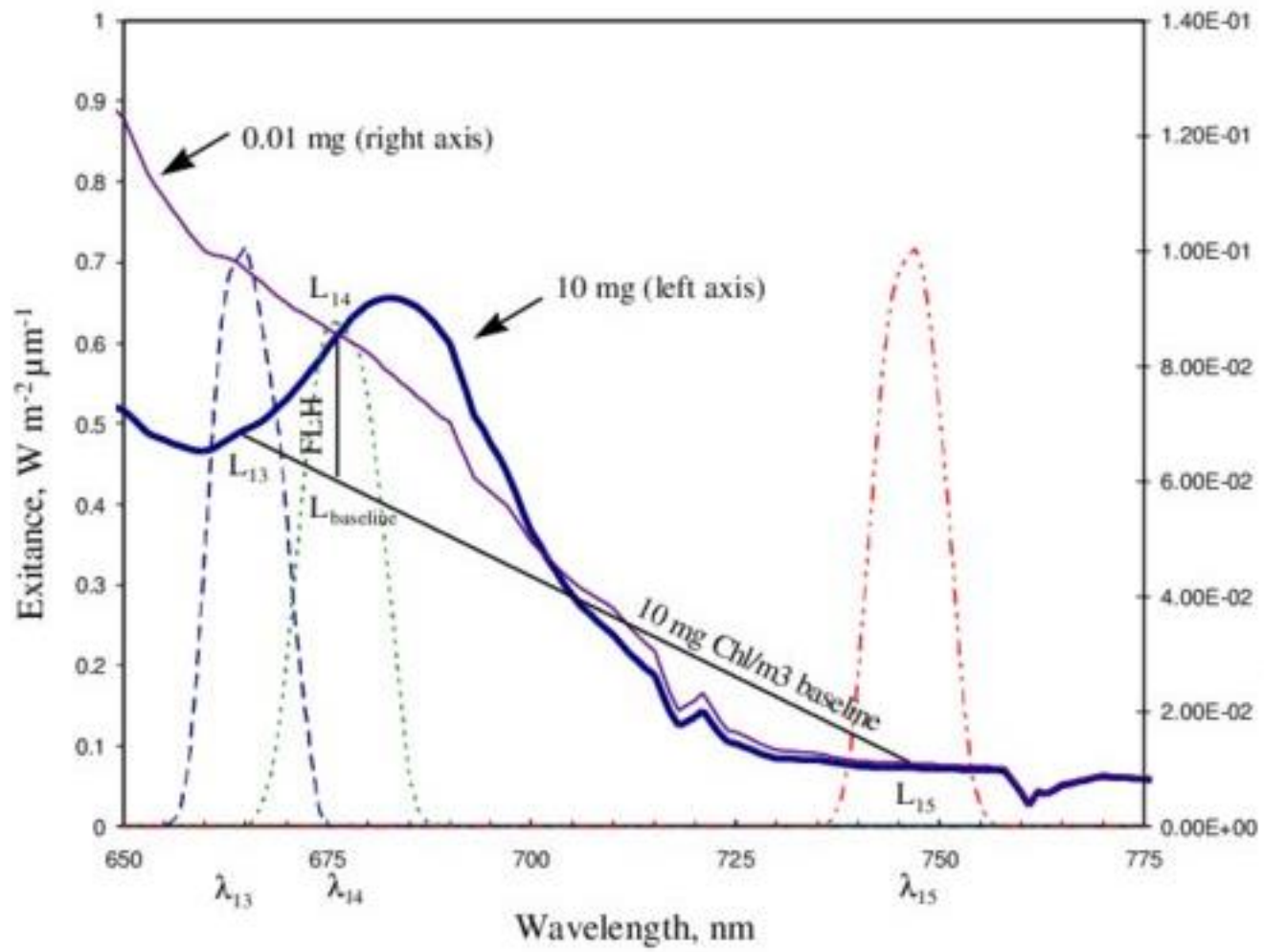


Red and Far-Red SIF, covering phytoplankton as well

2019



nFLH (Fraunhofer Line-Height) – very simple algorithm (prone to errors?)



Our Approach: Use the full PACE spectrum

Remote Sensing of Chlorophyll Fluorescence in the Ocean Using Imaging Spectrometry: Toward a Vertical Profile of Fluorescence

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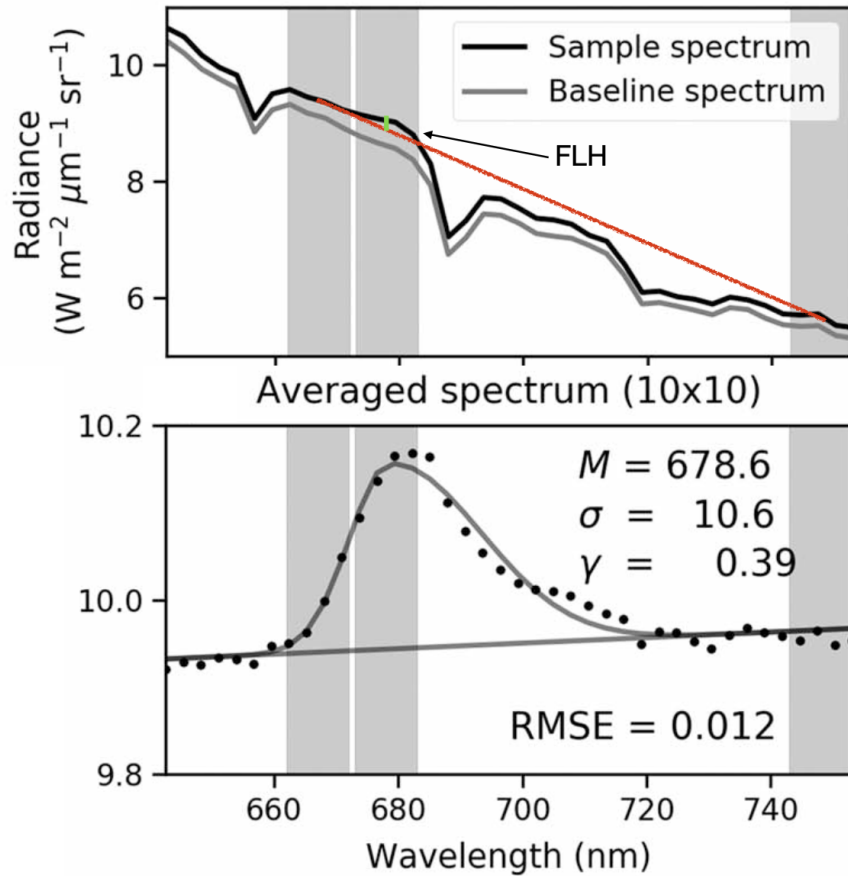


Figure 5: Prototype full spectrum fit in the Southern Ocean using PRISM. We can now fit the spectral shape of fluorescence, using a slightly adapted approach developed in Erickson et al. [2019].

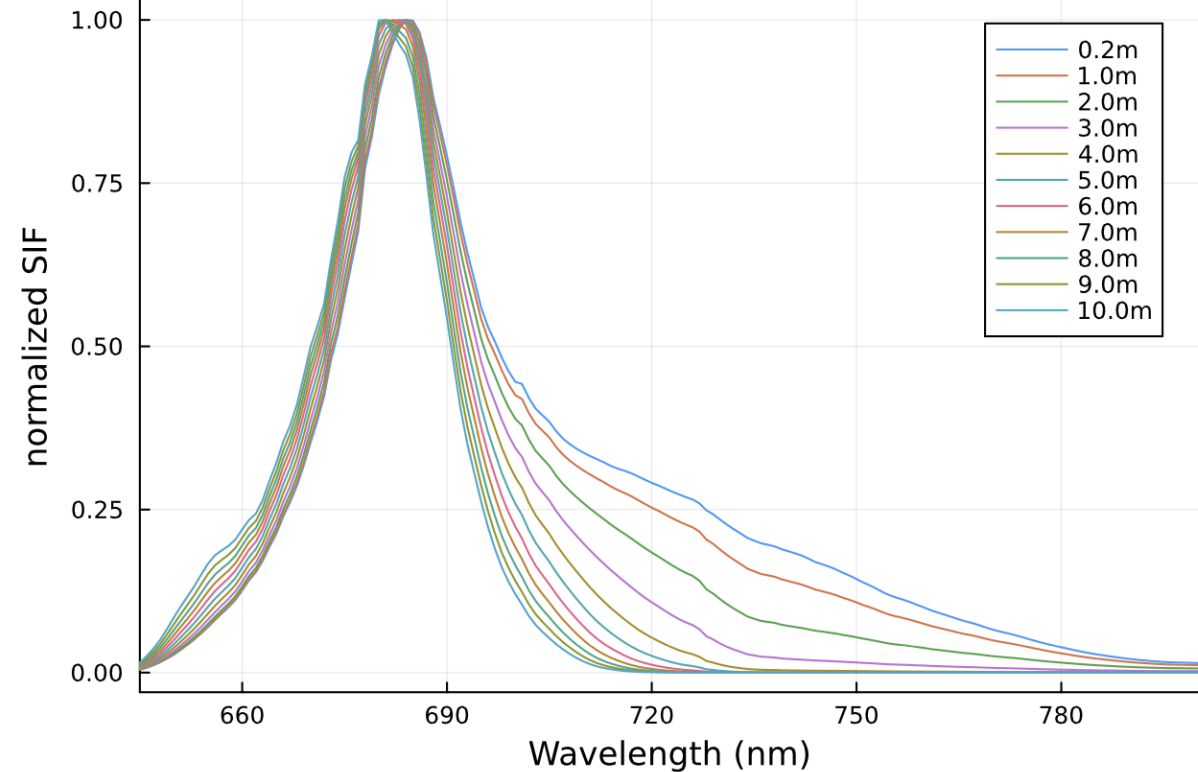


Figure 10: SIF spectral shapes can vary strongly. Normalized SIF spectra depend of the depth of the chlorophyll peak, assuming a gaussian distribution here. The SIF shape is very sensitive to the depth at

Thank You

Seeking talented postdoc to work with us on this exciting project
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Coding (ideally Julia) experience is helpful...