New applications with geostationary ocean colour radiometry

**Specific research topic:**

“Dynamics of suspended particulate matter (SPM) in river plumes”

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The Yangtze and Yellow Rivers (China) are two major world rivers in terms of freshwater discharge and export of terrestrial substances (e.g., SPM, POC).
SPM algorithm: issues with GEO sensors

- Atmospheric optical depth (36 km)
- Low sun zenith angles (9am and 4pm)
- No SWIR band (GOCI)

Two atmospheric correction algorithms specific for turbid waters developed for GOCI:

- Ahn et al. (2012): extension of the NIR similarity spectrum (Ruddick et al. 2006) to extremely turbid waters

- Wang et al. (2012; 2013): Use of invariant regional relationships established between nL_w(NIR) and K_d(490) derived from MODIS-Aqua products generated using the SWIR atmospheric correction

*From Lamquin et al. 2012*
Assessment of GOCI seawater reflectance products

Comparing GOCI Rrs products (Ahn et al. 2012) to MODIS-Aqua Rrs (SWIR corrected (Wang and Shi 2007)

- Preliminary ‘validation’ of GOCI Rrs products in the visible (500 – 700 nm)
- Significant differences in the NIR
Applications: filter clouds and SPM tidal dynamics

- Hangzhou Bay appears (clouds)
- Maximum turbidity at low water

Ongoing work...

\[ R_{RC}(560) \text{ (dl)} \]
GEO satellite observations combined with data from autonomous profiling floats (Provbio)
The capabilities of GEO ocean colour remote sensing already demonstrated (GOCI)

New applications:
- in coastal waters: fluxes at land-sea interfaces, tidal dynamics and residual transport
- in the open ocean: daily cycles of primary production?

Future missions:
e.g., OCAPI mission
Ocean Color Advanced Permanent Imager

“A breakthrough in ocean sciences thanks to hourly observations of ocean colour in coastal zones and the open ocean from a geosynchronous orbit”
Use of optical data from autonomous profiling and drifting floats in the Gironde and Rhône river plumes: the PROVPANACHE project (PI D. Doxaran)

Profiling floats: autonomous physical & optical measurements

PROVBIO : PROVOR + c(660) + b_b(555) + Chla Fluo + CDOM Fluo + Ed(3\lambda) + iridium

PI H. Claustre (LOV)

www.oao.obs-vlfr.fr/carto/index.html