Splinter Session 2: "**Advances in Atmospheric Correction of Satellite Ocean-Color Imagery**"
(Moderators: S. Bailey, R. Frouin, C. Jamet)

-Objectives

- To review advances in atmospheric correction.
- To identify areas/issues that still need improvements.
- To examine whether planned sensors have the capabilities to exploit the advances and improvements.
- To discuss mechanisms that value the new algorithms, in the context of operational processing and continuity versus innovation.

Format

-3 talks (1:30 h):

(1) atmospheric correction over turbid waters (C. Jamet),

(2) aerosol determination with emphasis on aerosol absorption (S. Bailey), and

(3) atmospheric correction in the presence of Sun glint, thin clouds, and adjacency effects (R. Frouin).

-General discussion (1 h)

Questions/Issues

1. How significant are the advances? What aspects still require improvements? Aerosol model determination? Bio-optical modeling in the near infrared? Dealing with imagery gaps? Strategy to adopt?

-New techniques have been proposed to handle absorbing aerosols, sun glint, thin clouds, that are robust to adjacency effects, allowing significant increase in spatial coverage of ocean-color products.

-Cloud screening (small clouds, shadows) should be linked to atmospheric correction, often an issue in coastal waters.

-Even with recent advances, large gaps still exist in imagery. More attention/effort should be put by agencies to deal with this problem –generating long-time series is not just lining up ocean color missions (e.g., combining observations and modeling).

-Aerosol model determination is useful to at least constrain the ill-posed inverse ocean-color problem, but errors may be too large to compute perturbing signal with sufficient accuracy, i.e., it is desirable to estimate the perturbing signal more directly. Aerosol information is required for studies of aerosol/ocean interactions (e.g., iron fertilization).

-Aerosol altitude is an essential variable to compute atmospheric effects at ocean color wavelengths, especially in the presence of absorbing aerosols (but even if they are not absorbing).

-Absorption by hydrosols becomes important in the NIR in the case of very turbid waters, and needs to be determined. Better bio-optical models in the NIR are needed.

2. Do planned sensors have the capabilities to exploit the advances? What are the implications for future ocean color sensor/mission design?

-Planned sensors generally have the required spectral capability (measurements from UV to SWIR), but it is recommended to complement spectral measurements by multi-angular and multi-polarized instruments. Need to measure NO2 for atmospheric correction in coastal zone.

-Synergy between instruments/missions should be considered, in particular OLCI (visible NIR) and SLSTR (SWIR) (1b or 1c co-registered).

-New techniques suggest sensors should not saturate over sun glint and clouds, and that it may not be necessary to tilt them, but strategy should keep continuity while allowing improvements.

3. How to value the new techniques? Are they mature enough for operational processing? How to integrate advances and new capabilities for climate change detection?

-Efforts should be made by space agencies to make the new techniques more visible, e.g., via inter-comparison activities, implementation in SeaDAS for evaluation/feedback, etc. (requires resources).

-Parallel processing lines with standard and improved schemes, that may be targeted to specific products in view of accuracy, may help to understand advantages and limitations of individual techniques and define the quality of final products and allow for continuity. But several processing lines may be confusing to users.