WATERHYPERNET – A network of hyperspectral radiometers for multi-satellite water reflectance validation

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Satellite agencies in Europe and the United States now guarantee a continuous flow of long-term data for ocean colour radiometry and chlorophyll a from the operational Sentinel-3 and VIIRS missions. In addition to these dedicated ocean colour missions, there is a fast-growing interest in exploiting higher spatial or higher temporal resolution data for coastal and inland waters from many other satellite missions, designed originally for terrestrial or meteorological applications. The exploitation of data from all such missions requires highly accurate atmospheric correction and validation of the resulting water reflectances.The experience from MERIS and MODIS has established that radiometric validation of ocean colour missions is best performed by autonomous ground-based instruments on fixed platforms, functioning continuously according to a standardised protocol and with harmonised calibration and data processing and public distribution of data. The AERONET-OC network [Zibordi et al, 2009] has clearly demonstrated this concept by providing a large number of high quality matchups in diverse water types for validation of all ocean colour missions. However, the AERONET-OC network is based on a multispectral instrument and cannot validate all spectral bands on all optical remote sensors. A new network is therefore being developed following closely the AERONET-OC federation concept but using the TRIOS/RAMSES hyperspectral radiometer. The instrument system consists of one radiance and one irradiance sensor on a pointing robot, controlled by a microprocessor and supplemented with GPS, inclinometer and video camera data feeds [Vansteenwegen et al – poster]. The measurement protocol is based on [Mobley, 1999], but includes additional scenarios for different viewing zenith and azimuth configurations. The systems will be deployed initially in Belgian coastal and inland waters, then at HYPERMAQ project partner sites in Argentina, China and France before full international expansion. The network will provide water reflectance data for the validation of all visible and near infrared bands of all optical missions, including Sentinel-3AB, Sentinel-2AB, PROBA-V, MODIS-AQUA/TERRA, VIIRS, Landsat-8, Pléiades, CHRIS-PROBA, MSG-SEVIRI … ENMAP, PACE, MTG and any future optical missions including nanosatellites.