Atmospheric correction for coastal and inland water application of very high resolution satellite imagery

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Coastal and inland waters can be characterized by very dynamic variability on short temporal and spatial scales. Very high spatial resolution satellite imagery (<10 m) can provide new insights into sediment transport processes in and around ports and offshore constructions. Furthermore it can be used to provide remotely sensed observations for specific case studies in small or narrow water bodies, to assess sub-pixel scale effects in medium resolution imagery and to characterize fixed validation sites for traditional ocean colour sensors. There are generally no standard atmospherically corrected products over water for the very high resolution sensors and using existing approaches poor results may be obtained for water applications. In this poster a generic algorithm for the atmospheric correction of very high resolution optical satellite imagery is presented. The algorithm takes advantage of multiple dark targets in the scene, which are spatially resolved, and switches to the best bands and targets for the determination of the aerosol signal. The algorithm is applied to imagery from the Pléiades constellation for inland and coastal sites, and is validated with AERONET and AERONET-OC data. Pléiades is a series of two identical, pointable satellites with four broad spectral bands (blue, green, red, and NIR) and a panchromatic channel respectively at 2.8 and 0.7 m spatial resolution. A practical application of monitoring dredging activities and small scale sediment transport around the port of Zeebrugge is demonstrated. The impact of the monitoring station on which the AERONET-OC instrument is mounted is assessed, both in terms of the optical signal of the structure and its shadow, and the structure's impact on the local spatial variability.