SIMEC, a sensor-generic correction algorithm for adjacency effects in coastal and inland waters

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Using remote sensing data for water quality monitoring has many advantages as it is possible to investigate large areas and no in-situ measurements are necessarily required. In the near future, new and improved products are expected with the launch of new satellites such as HyspIRI, Sentinel-2, Sentinel-3, EnMap and PRISM. These satellites are characterized by an increased spatial and spectral resolution and are particularly interesting for the monitoring of inland and coastal waters. In these waters, the correct retrieval of water quality and aerosol parameters is however hampered by environment effects, which can be observed as a blurring effect caused by scattering in the atmosphere of the highly contrasting dark waters and bright land, particularly if vegetated. This phenomenon is referred to as adjacency effect and has been observed many times in medium or low resolution ocean colour product such as MERIS or MODIS imagery (Feng *et al.*, 2011; Potes *et al.*, 2012) and will be even more pronounced in the high resolution products of future satellite missions. Not correcting for adjacency effects might lead to misinterpretation of the observed signal and wrong conclusions might be taken concerning the water quality. To prevent this, the SIMilarity Environment Correction (SIMEC) algorithm (Sterckx *et al.*, 2014) has been developed. The SIMEC correction algorithm estimates the contribution of the background radiance based on the correspondence with the Near-Infrared (NIR) similarity spectrum (Ruddick *et al.*, 2006). It is assumed that the shape of the NIR similarity spectrum is invariant for water pixels, as it is determined by pure water absorption. If the spectrum of a water pixel does not correspond to the NIR similarity spectrum, it is affected by adjacency effect and background radiance causing the environment effect should be taken into account. One of the advantages of SIMEC is that no assumptions have to be made on the NIR albedo, so that the correction can also be applied over more turbid waters. SIMEC was initially developed to correct remotely sensed airborne data of water bodies (Sterckx *et al.*, 2011) and is further optimized into a sensor-generic algorithm (Sterckx *et al.*, 2014), also applicable to satellite imagery.

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