VALIDATION OF MERIS OCEAN COLOUR RADIOMETRY IN THE SOUTHERN BENGUELA

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The Southern Benguela, as one of the world's most productive upwelling systems, is a challenging and rewarding study for ocean colour radiometry. Very high biomass coastal waters with little terrigenous input, are combined with the challenges of correcting for a highly variable and poorly characterised atmosphere with considerable aeolian input from a semi-desert coastline. A radiometric validation exercise was performed using co-incident Medium Resolution Imaging Spectrometer (MERIS) data, and *in situ* radiometer data from a mooring in the Southern Benguela during the late summer bloom seasons of 2005 and 2006. The data are typified by very high biomass conditions. Sources of error associated with the *in situ* data are assessed and the magnitudes quantified. The satellite data are examined with particular reference to uncertainty derived from the atmospheric correction processes, which perform unreliably in many of the matchup instances. Results show that the accuracy of the atmospheric correction does not appear to be related to the in-water constituents and is more likely due to atmospheric variability or aerosol features that are not addressed in the models employed by the default atmospheric correction algorithms. It is also shown that while radiometric errors are largest in the red region of the spectrum, confidence in measurements here increases significantly under high biomass conditions, underlining the importance of the red wavebands for coastal remote sensing. Recommendations towards the development of a comprehensive regional validation strategy include the establishment of low-cost measurement protocols for high biomass conditions, as well as further investigations into regional atmospheric variability to improve confidence in the atmospheric correction procedures.