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FUSION OF OPTICAL DATA AND SAR DATA FOR THE ESTIMATION OF NITROGEN CONCENTRATION IN PEARL RIVER ESTUARY HONG KONG SEAS, CHINA

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Keywords: Total inorganic nitrogen, RADARSAT-2, HJ-1 CCD image, backscattering coefficient, optical parameters, polarization parameters

Abstract. The knowledge of nitrogen concentration in the ocean is fundamental for the study of oceanic biogeochemical processes. The objective of this research is to estimate total inorganic nitrogen (TIN) by integrating optical parameters from HJ-1 CCD image and polarization parameters from RADARSAT-2 quad-polarization image. The situ data and HJ-1 CCD, RADARSAT-2 image were acquired from Pearl River Estuary Hong Kong Seas, China in August, 2010. The four sensitive parameters, reflectance of Band 4, NDSI (Normalized Difference Spectral Index), the backscattering coefficient of HV and VH were derived as input variables to assess the TIN. A multiple regression model was established between four input variables and TIN. The result showed that the fusion of optical data and SAR data was proved to be successful in estimating TIN in sea surface, with the correlation coefficient (R^2) between measured TIN and predicated TIN of 0.774, and the root mean square error (RMSE) of 0.063. The optical data in combination with SAR data is promising for detecting biochemical component in sea surface.

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