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Merging of ocean colour data using wavelets

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Several satellites, having ocean color sensors on board, are currently in orbit: SeaWiFS (Sea-viewing Wide Field-of-view Sensor, on OrbView-2 (NASA, USA), since August, 1st, 1997), MODIS-Aqua (Moderate Resolution Imaging Spectroradiometer, on Aqua (NASA, USA), since May, 4th, 2002), etc. Each mission covers between 10% and 15% of the global ocean in a day, making a follow on analysis of chlorophyll concentrations patterns and structures very difficult. Their space and time resolution are different, thus allowing to merge their data to obtain a dataset as complete as possible. A new method based on the wavelets has been developed to merge ocean color data. It consists in two steps. First, missing data in each daily map (i.e. related to SeaWiFS and MODIS/Aqua for a given day) are inferred using turbulence cascading. Then, both daily images are combined by combining their wavelet coefficients. An evaluation of this merger method is provided on the Gulf Stream region. A comparison is shown with results obtained by weighted averaging and classical objective analysis.