Geophysical Research Abstracts
Vol. 14, EGU2012-5550, 2012
EGU General Assembly 2012
© Author(s) 2012

Processing of Black Sea radiance coefficient spectra obtained by remote sensing using new calibration method

V. V. Rostovtseva
P.P.Shirshov Institute of Oceanology RAS, Moscow, Russian Federation (vvrostovtseva@bk.ru)

Sea radiance coefficient characterizes some optical properties of sea waters (absorption and backscattering) thus giving the possibility to estimate water admixture concentration in shelf waters and inland seas. It was shown sea radiance coefficient spectra can be obtained by remote sensing from board a ship by measuring the three values: upward and downward sea surface radiation and radiance of the adjacent sky area [1, 2]. However, calculated from those data sea radiance coefficient spectra are affected by the weather conditions such as cloudiness, wind velocity and sea roughness and need some calibration.

It was shown that all the spectra of sea radiance coefficient have some common peculiarities despite the content of sea water admixtures. These peculiarities can be explained by the spectrum of pure sea water absorption. Taking this into account a new calibration method was developed. In the spectrum of pure sea water absorption in the visible some narrow spectral bands were selected where water absorption changes far more rapidly than absorption in the neighboring bands and the optical properties (absorption and scattering) of the main sea water admixtures. That causes some typical peculiarities in the appropriate places of the sea radiance spectrum using which the spectra of sea radiance coefficient can be calibrated.

The calculations were carried out for the spectra of sea radiance coefficient obtained at the north-east coast of the Black Sea with the portative spectrophotometer AVANTES from board a ship in summer 2006 [2]. Because of the Black Sea confined nature and strong interactions with the continent, its water optical properties differ from the open ocean water properties and often exhibit significant regional peculiarities especially in the areas of mixing with river waters.

The suggested calibration enables to get the sea radiance coefficient spectra independent from the weather and measurement conditions. It is also possible to retrieve absorption spectra of sea water admixtures from the remote sensing data giving the possibility to study the inland seas peculiarities.

1. V. A. Matyushenko, V. N. Pelevin, V. V. Rostovtseva. Measurement of the sea radiance coefficient with a three-channel spectrophotometer from board a research ship. – Atmospheric and Oceanic Optics, 1996, Vol. 9, N 5, pp.421-424.
2. V. V. Rostovtseva, D.V. Kchlebnikov, V. V. Pelevin, B.V. Konovalov, P. O. Zavialov, A. B.Grabovskii, O.I.Abramov, G. G. Karlsen. Mapping small-scale river plumes in the Black Sea using shipboard spectrophotometry and fluorimetry. - EGU2011, Vienna, Austria, 2011.