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Multisensor observation of eddies and mesoscale features in coastal zones

O.Yu. Lavrova, M.I. Mityagina

Space Research Institute of Russian Academy of Sciences, Moscow, Russia
(olavrova@iki.rssi.ru / Fax: +7 495-3331056 / Phone: +7 495-3334256)

The results of long-term multisensor observations of coastal zones of the Baltic and Black Seas are discussed. The study is based on remote sensing satellite data obtained by SAR ERS-2, ASAR Envisat, MODIS Terra and Aqua, and AVHRR NOAA instruments over these regions. The data from these different sensors were co-located and analyzed jointly to investigate coastal water circulation, in particular the occurrence, evolution and drift of vortex structures. Special focus is on oceanic vortices of small and medium scales. Their investigation is important for understanding local mechanisms of mixing and circulation processes in the coastal zones. To a large extent, these mechanisms determine ecological, hydrodynamic and meteorological state of the coastal zone, constant monitoring of which is of vital necessity for these densely populated regions with well-developed industry, agriculture and rapidly growing tourist sector. Coastal waters of the regions appear to be abundant in surfactants of natural and artificial origins. Surfactant slicks imprinted in SAR images help to detect surface currents and vortex structures. Data obtained by AVHRR on board NOAA satellites allow to derive SST fields for the analysis of meso-scale water dynamics. MODIS instruments aboard Terra and Aqua satellites provide SST, ocean color and other optical properties measurements highlighting various meso- and small-scale water dynamics features, such as currents, eddies, dipoles, jets, filaments and river plumes.