Status of sea surface currents retrieval algorithm for Geo-KOMPSAT-2A/AMI

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Producing accurate and regular information regarding sea surface currents (SSC) is crucial for understanding the global oceanic environment. In recent decades, studies have long been conducted to retrieve information on SSC using satellite data such as sea surface height anomalies observed by satellite radar altimeters, the sequential sea surface temperature (SST) images and ocean colour data. Limitations such as sparse samplings of near-polar orbiting satellites can be overcome by high-resolution geostationary satellite SST images from Geo-KOMPSAT-2A (Geostationary-Korea Multi- Purpose Satellite-2A, GK-2A) / Advanced Meteorological Imager (AMI) of Korea scheduled for launch in 2018. It will offer more spectral bands, higher spatial resolution of about 0.5-2 km and faster imaging than Communication, Ocean and Meteorological Satellite (COMS). In this study, a complete description of the operational GK-2A/AMI SSC algorithm development at the current level is introduced. The SSC products are retrieved from subsequent Himawari-8 SST images, as a proxy for GK-2A SST, by applying the cloud detection and land/ocean mask data on the satellite images. The estimated currents are subjected to a quality control process to remove diverse errors. The accuracy of SSC is assessed by comparing quality-controlled currents obtained from surface drifters in the full-disk region. The estimated current speeds and directions show good agreement with the drifter-based values, with root-mean-square (bias) errors of 0.23 m/s (0.05 m/s) and 10.06° (1.8°), respectively. The estimated current field illustrates a rotating feature around a mesoscale anti-cyclonic eddy, as well as the characteristic meandering pattern of the Kuroshio Current.

Key words: Geo-KOMPSAT-2A/AMI, Sea Surface Current, Himawari-8 SST images, surface drifters