



In situ observation of harmful dinoflagellate bloom in the eastern coast of Kyushu, Japan

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Oita coast, where is in the eastern coast of Kyushu, Japan, is a richly fish aquaculture area. However, sometimes harmful algal blooms occur in this region, especially harmful dinoflagellates blooms, and cultured fish mortality occurs. Ocean color remote sensing is expected as a useful tool to reduce the financial damage of harmful algal blooms. However, ocean color data is low accuracy in the coastal region because colored dissolved organic matter and suspended solid are dominant. More optical data of harmful algal blooms are required because there are few data in harmful algal blooms. The field observation was conducted to understand the inherent optical property of harmful dinoflagellate bloom in the eastern coast of Oita prefecture on April and August 2013. Chlorophyll-a maximum ($>24 \text{ mg m}^{-3}$) was observed in the subsurface layer on April 2013. The dominant phytoplankton species in this chlorophyll-a maximum layer was dinoflagellate *Cochlodinium polykrikoides* ($>300 \text{ cells ml}^{-1}$) and early stage of the bloom was formed. Peak of the remote sensing reflectance was near 565nm due to strong phytoplankton absorption within 400 ~ 500 nm domain from the subsurface bloom layer. Moreover, high phytoplankton absorption coefficient was observed at the shorter wavelength ($< 400\text{nm}$). This strong absorption might be due to mycosporine-like amino acids, which absorb the UV (Kahru and Mitchell, 1998). And this subsurface *C. polykrikoides* bloom was detected by using dinoflagellate bloom detection algorithm, which is a simpler new satellite remote sensing-based harmful algal blooms detection method for JAXA's GCOM-C/SGLI (Siswanto et al., 2013). However, detection of the dinoflagellate *Karenia mikimotoi* bloom by using the algorithm on August 2013 was difficult as colored dissolved organic matter and detritus absorptions were high. Although the algorithm could detect the early stage of *C. polykrikoides* bloom, the algorithm improvement to detect the harmful algal blooms in the case II water is thus highly required. This research is part of the combined research between Japan Aerospace Exploration Agency and National Research Institute of Fisheries science.