Japan Geoscience Union Meeting 2012
(May 20-25 2012 at Makuhari, Chiba, Japan)

ATT34-03 Room:202 Time:May 20 14:45-15:00

Satellite Mission Proposal for Ocean Color Observation in the Next Generation

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The Coastal Zone Color Scanner (CZCS) onboard Nimbus-7, which is the first satellite sensor specifically targeting ocean color observation, is launched by the National Aeronautics and Space Administration (NASA) on 24th October 1978. Since then, biological and biogeochemical observation in coastal and oceanic waters has dramatically changed from economically-oppressing and time-consuming in situ observation to the automated global observation. The satellite ocean color observation is practically only the way to observe biological and biogeochemical variables in the ocean globally, and therefore the success of the satellite ocean color observation has highly been appreciated among biological and biogeochemical oceanographers. Japan Aerospace Exploration Agency (JAXA) also launched an ocean color sensors such as the Ocean Color and Temperature Scanner (OCTS) onboard the Advanced Earth Observation Satellite (ADEOS) in 1996, and the GLobal Imager (GLI) onboard the ADEOS-II in 2002. From these missions, not only valuable global data of ocean color was obtained but also domestic and oversea ocean color scientists were teamed up and young students specifically in the ocean color science were educated, which led to the most recent mission, the Global Climate Observation Mission-Climate (GCOM-C). On the other hand, ocean color observation itself is evolving. Until GLI, the main product obtained from the color observation was a phytoplankton pigment called Chlorophyll-a, which is often used as an index of phytoplankton biomass in the ocean. In the recent missions (including GCOM-C) in the world, however, novel attempts to retrieve new products (e.g. marine productivity, phytoplankton functional types, harmful algae bloom or red tide, particulate organic carbon, particulate inorganic carbon, particle size distribution, light absorption and scattering properties of biogeochemical matters, euphotic zone) have also been begun. Thus, the satellite ocean color observation has great potential to derive many products to contribute to a wide variety of applications. In aim to apply the ocean color observation to those issues related to climate change, coastal environment issue, inland water issue, fisheries resource and management, harmful algae, marine disaster, a new ocean color mission will be proposed in this presentation and a hardware requirement for the next generation ocean color observation will be discussed.

Keywords: ocean color, satellite observation, New Mission