[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG36]Satellite Earth Environment Observation

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In recent years, we cannot avoid facing issues on global environmental changes that occur in various spatiotemporal scales. The earth environmental observation data by satellites became the necessary basic data to tackle and solve those issues. Due to the recent advancement in the observation sensor technique and the data processing technique, the satellite observation has been showing rapid progress, and the time is changing from examining the accuracy of the observation sensor data to the advancement of the data application, leading to broaden potential users. In these days application became synergetic, so we comprehensively pick
up this topic in the Atmospheric and Hydrospheric Sciences Session of this Union Meeting that enables to comprise the atmospheric, oceanic and land sciences; by combining the intelligence and the knowledge of the party, we propose a session that aims to prompt further studies towards the issues on earth environmental change, the advancement in the data application and future plans of Earth Observation missions.

[ACG36-P27]Development of the LAI and FAPAR product using GCOM-C/SGLI data

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The Japan Aerospace Exploration Agency (JAXA) launched the Global Change Observation Mission - Climate (GCOM-C) satellite last December. We have been developing one of the GCOM-C standard land products, the Leaf Area Index (LAI) and the fraction of Absorbed Photosynthetically Active Radiation (fAPAR) product. In this document, we introduce the current situation for producing LAI and fAPAR product using SGLI data.

The LAI is defined as one half of the total green leaf area per unit ground surface area. In the GCOM-C product, LAI was estimated for overstory leaf. The information for understory vegetation is added as understory NDVI. The fAPAR is defined as the proportion of the effectively absorbed solar radiation by plants in the photosynthetically active wavelengths (the spectral region from 400 to 700 nm).

LAI and fAPAR were estimated based on the look-up tables showing the relationships between the multi-angle atmospherically-corrected land surface reflectance data and the LAI or fAPAR. The look-up tables were produced for the 6 kinds of land covers and various geometry conditions. They were adjusted to fit with the field-observed reference data collected from literatures.

The relationships between LAI/fAPAR and surface reflectance data at the top of canopy were simulated using a radiative transfer simulator, the Forest Light Environmental Simulator (FLiES) [1]. It simulates

radiative transfers in the forests and grasslands based on the Monte Carlo method.

The accuracy of the retrieved LAI and fAPAR will be assessed using the in-situ observation data which will be collected at several sites on global this year. In this research, the MODIS surface reflectance data were used for the satellite data for producing the look-up table. The look-up table is revised to fit with the SGLI data.

[1] H. Kobayashi *et al.*, A coupled 1-D atmosphere and 3-D canopy radiative transfer model for canopy reflectance, light environment, and photosynthesis simulation in a heterogeneous landscape, *Remote Sensing of Environment*, **112** (2008), 173-185.