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AMSR シリーズによる全球水循環の長期継続観測
Long-term continuous observation of global water cycle by AMSR series

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In monitoring global environment and climate from space, the highest priority has been given to the continuity, frequency, and uniformity of the data records. These are also important to make satellite Earth observation an infrastructure in the society. The Global Change Observation Mission (GCOM) is designed to satisfy those needs. GCOM is a concept to perform global Earth observation from many perspectives, comprising of two polar-orbiting satellite series and spreading over three generations to achieve long-term and consistent data records. Two satellite series are GCOM-W (Water) and GCOM-C (Climate). The GCOM 1st ? Water (GCOM-W1) is the first satellite of the series and launched on May 18, 2012. The sole mission instrument on the satellite is the Advanced Microwave Scanning Radiometer-2 (AMSR2), which is a multi-frequency passive microwave radiometer system and serves as the major instrument to cover water-related geophysical parameters in the GCOM mission. AMSR2 is a successor instrument to the AMSR for the Earth Observing Systems (AMSR-E) and AMSR on the Advanced Earth Observing Satellite-II (ADEOS-II). Microwave radiometers have been playing an important role in measuring global water and energy cycles. Based on the accumulation of data records such as by the Scanning Multichannel Microwave Radiometer (SMMR) and the Special Sensor Microwave/Imager (SSM/I), the AMSR series made a significant progress in spatial resolution and frequency range. Although the characteristics of AMSR2 is similar to AMSR-E, the instrument had improved and enhanced in several important aspects such as calibration accuracy, spatial resolution, and reliability of instrument, as the latest instrument of the AMSR series. In addition to the basic product of brightness temperatures (Tbs), various water-related geophysical products are generated from Tbs obtained by AMSR2. They include integrated water vapor (total precipitable water), integrated cloud liquid water, precipitation, sea surface temperature, sea surface wind speed, sea ice concentration, soil moisture content, and snow depth. These products, as well as many geophysical parameters from the A-Train constellation and GCOM-C1, are expected to be utilized in many research areas covering water cycle and climate variability, and operational applications such as numerical weather forecast, drought monitoring, and fishery.

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