

Long-term Observation of Global Water Cycle Observation by the Global Change Observation Mission - Water (GCOM-W) Satellite and the Advanced Microwave Scanning Radiometer (AMSR)

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The first Advanced Microwave Scanning Radiometer (AMSR) series instrument on orbit was the AMSR for EOS (AMSR-E) provided to NASA's Aqua satellite launched in May 2002, and since then, a series of AMSR instruments has continued high-spatial resolution and high-frequent observations of water-related parameters that composes the global water cycle in atmosphere, ocean, land and cryosphere. The latest and current AMSR instrument is the AMSR2 on board the Global Change Observation Mission (GCOM) -Water (GCOM-W) or "SHIZUKU", which was launched in May 2012. The GCOM-W satellite was injected to the A-train orbit to keep observation continuities to AMSR-E and provide synergies with the other A-train constellation satellites.

AMSR series instruments are multi-frequency, total-power microwave radiometer system with dual polarization channels for all frequency bands and have C-band channels to observe sea surface temperature (SST) and soil moisture content. Channel set of AMSR2 is almost identical to that of AMSR-E, but new 7.3-GHz channels are added along with previous 6.9-GHz channels to mitigate influence of Radio Frequency Interferences (RFIs) in brightness temperature. Both GCOM-W satellite and AMSR2 instrument is in healthy condition to continue its observation from the orbit.

AMSR2 standard products are available from the JAXA Globe-Portal (<https://www.gportal.jaxa.jp/>) web site. The latest version of AMSR2 products is Ver. 3.0 (as of February 2018) for SST, sea surface wind speed, sea ice concentration and soil moisture content released in March 2017, and Ver. 2.0 for other products. New research product, land surface temperature, has been released to public in February 2018 through the GCOM-W Research Product Distribution Service (http://suzaku.eorc.jaxa.jp/GCOM_W/research/resdist.html) in addition to all-weather sea surface wind speed research product, which was updated to Ver.3.0 in January 2018. JAXA also reprocessed AMSR-E data applying the latest AMSR2 algorithms and format to provide continuous and consistent dataset between AMSR-E and AMSR2 over 15 years for climate studies. All new AMSR-E products is planning to be released from the Globe-Portal in spring 2018.

AMSR2 products are used in various operational and research fields, including weather forecast, typhoon analysis, global rainfall map, ocean monitoring, fisheries, sea ice extent monitoring and maritime navigation in polar regions. Designed mission life of the GCOM-W satellite is five years and the GCOM-W satellite is now in extended mission phase. In corresponding to national and international users' requests to continue high-resolution observation by AMSR series instrument, AMSR2 follow-on instrument is currently proposed to be carried by the Greenhouse Gases Observation Satellite-3 (GOSAT-3). We are planning to build and test prototypes of the sensor's components of AMSR2 follow-on in JFY 2018.

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