

EARTH OBSERVATION SYMPOSIUM (B1)
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CONCEPT OF ASIAN SMALL PRECIPITATION RADAR CONSTELLATION

Abstract

This paper introduces the concept of Asian Small Precipitation Radar Constellation (ASPRC) developed in the mission planning department of JAXA.

The Asian region suffers from water disasters. However, many emerging countries in the region still cannot provide effective early warning because they lack sufficient and sustainable ground rainfall measurement. Satellite precipitation measurement can be very effective for actual use for meteorology, water disaster management and water resources management.

JAXA provides hourly rainfall data “Global Satellite Mapping of Precipitation (GSMaP)” based on data mainly from microwave radiometers on different satellites of the Global Precipitation Measurement (GPM) constellation. More precipitation measurement satellites, especially those with the satellite precipitation radar, which has better accuracy than the microwave radiometer, are needed To improve accuracy of GSMaP to the level necessary for meteorology and water disaster management in the emerging countries.

To make the precipitation measurement satellite affordable for the emerging countries in the region that have been active to build capacity to develop satellites and share the same issues on water disaster management, “the small precipitation radar satellite” was conceptualized by reducing the size and cost of existing JAXA’s satellite precipitation radar and putting it on the small satellite bus. “Asian Small Precipitation Radar Satellite Constellation (ASPRC)” can be realized by the multiple small precipitation radar satellites launched by emerging countries in the region, as one of potential international cooperation programs in the development of space-based Earth observation systems.

This paper introduces (i) the result of the study of mission requirements such as user needs, data requirements based on interviews of space agencies and user agencies of satellite precipitation data in the region and analyses such as the one for understand improvement of GSMaP by different observation frequency of the ASPRC, and (ii) the concept of the ASPRC system that satisfies with these mission requirements.