EARTH OBSERVATION SYMPOSIUM (B1)
Enhancing Earth Observations Through Space Radar (6)

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RADARSAT CONSTELLATION AN EVOLUTION OF THE RADARSAT PROGRAM

Abstract

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The Canadian Space Agency (CSA) is currently developing a three-satellite constellation referred to as the RADARSAT Constellation Mission (RCM) with the objective of ensuring C-band Synthetic Aperture Radar (SAR) data continuity in the next decade with improved operational use and improved system reliability. The constellation concept is being designed as a wide area monitoring system with an average daily revisit and daily access to 90In support of Maritime Surveillance, the RADARSAT Constellation mission will assure safe year round navigation in Canadian waters and improved maritime threat identification and tracking. It will also contribute to improved weather prediction, climate monitoring and oil pollution monitoring. The wide-area ScanSAR mode with a swath width of 350 km and a 4-look medium resolution of 50 m will be used specifically for maritime surveillance and sea ice monitoring. In support of Disaster Management, the RADARSAT Constellation's availability of frequent revisits will allow for regular collection of data to support all aspects of risk assessment and disaster planning. The mission will provide information based on interferometric SAR (InSAR) analysis to detect areas affected by geohazards and to monitor climate change related processes. It will also allow prediction of flash floods through InSAR analysis, measurement of wind speed and direction for hurricane monitoring, and monitor soil moisture information to forecast drought and forest fires. Also, small interferometric baselines will support the measurement of ice velocities and small-scale surface deformation caused by tectonic processes, volcanic activities, landslides, and subsidence.

In support of Ecosystem Monitoring, the RADARSAT Constellation mission will assure support to sustained development of agriculture and forestry resources contribute to protection of the global environment and enhance understanding of climate change and its impact on ecosystems. SAR satellite images will enable the detection of changes over time in Canada's coastal, wetlands and wildlife habitats.

The first satellite of the constellation will be launched to ensure that there is no data gap at the end of life of RADARSAT-2. The system does not aim to reproduce RADARSAT-2, but rather to meet core demands at better value for money, and enable new applications. Mission development began in 2005. A contract was awarded to MDA in November 2008 to undertake the preliminary design (Phase B) of the satellite systems and associated ground segment. The launches of the satellites are planned for 2014, 2015 and 2016.

This paper will describe some of the design aspects of RCM and show the evolution relative to previous RADARSAT-1 and RADARSAT-2 programs.