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CHORUS – CHANGING HOW AND WHEN YOU SEE THE WORLD

Abstract

MDA has embarked on a major new initiative called CHORUS, a Synthetic Aperture RADAR (SAR) mission that will provide continuity for the current users of RADARSAT-2, which has been providing C-band SAR data for over fourteen years. The CHORUS constellation includes a trailing X-band SAR imaging spacecraft and the combination of these two spacecraft (CHORUS-C and CHORUS-X) will introduce new capabilities not available with RADARSAT-2. These capabilities will serve to extend MDA's market-leading geospatial data, products and analytics services business well into the future.

Leveraging the technology developed on RADARSAT-2 and more recently on the RADARSAT Constellation Mission (RCM), significant innovations for the CHORUS mission will result in improved access, better revisit, broader swath coverage, lower noise, less data compression, faster data rates, and higher-resolution.

The CHORUS-C spacecraft will provide extremely broad coverage. With the capability of providing a 700 km swath with 50 m resolution and the ability to look in left and right looking modes, CHORUS-C will be capable of covering large areas quickly and cost efficiently. This information can be brought down in Near Real Time (NRT) and then used to task the CHORUS-X spacecraft to provide high resolution imagery (0.5 m) of areas of interest. With the CHORUS-X spacecraft trailing by one hour, the resulting high resolution imagery provides high value imagery in a timely manner.

Using a mid-inclination orbit, CHORUS will provide coverage over a range of times throughout the day and night, something that is not available with current SAR spacecraft in sun-synchronous orbits. This temporal shift is about 20 minutes each day, which will result in covering all temporal ranges many times over the course of the mission. This mid-inclination orbit also provides improved coverage between +/- 62.5 degrees latitude compared to a sun-synchronous orbit spacecraft.

The CHORUS system has been designed for NRT applications and will be used extensively for maritime surveillance and other time critical applications (e.g., land intelligence and Disaster Response), but with 20 minutes of imaging capacity per orbit with CHORUS-C and 3 minutes per orbit with CHORUS-X, will also be capable of pre-planned systematic collections for monitoring applications (e.g., forestry, mining, pipelines) including interferometry.

This paper will provide the current status of the CHORUS program, show the key performance parameters of the CHORUS system and highlight some of the upcoming milestones for the CHORUS program.