

RADARSAT-2 Image Quality and Calibration Update

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ABSTRACT

RADARSAT-2 continues to operate well and without degradation in image quality. Launched in December 2007, RADARSAT-2 continues to support operational imaging using approximately 300 different beams in 20 different beam modes (15 Strip-map modes, 4 ScanSAR modes, and a Spotlight mode), as well as several experimental and calibration beams. It continues to support options for different polarization selections and both left- and right-looking satellite orientation. It has performed more than 1,150,000 successful acquisitions.

As part of ongoing operations, system performance is monitored continuously through product quality checking, telemetry analysis, as well as systematic collection and analysis of images and other forms of data. Calibration sites for these acquisitions include the Amazon rainforest, the Doldrums region of the Pacific Ocean, and point targets (corner reflectors, antenna dishes, transponders). The analysis yields a variety of image quality measures and antenna parameters that are tracked systematically. These activities are planned carefully in order to span the large number of beams and modes efficiently.

Results show the stability of key measures including radiometric accuracy, geolocation accuracy, impulse response statistics, noise levels, polarimetric accuracy, and precise beam pointing. In addition, ongoing SAR antenna diagnostic tests monitor the health of T/R modules, individually and grouped together by column.

As necessary, this combined information is used to apply ongoing calibration adjustments. Recent and planned forthcoming adjustments include selected minor refinements to phase balancing offsets between antenna wings in dual-receive-aperture modes, for ongoing correction of seasonal variations.

In addition, the RADARSAT-2 system is highly configurable and expandable with new capabilities in order to serve evolving client needs, including moving target indication modes for Defense Research Development Canada (DRDC).

MDA Space also continues to predict potential C-Band SAR interference events with RCM, Sentinel-1, Gaofen-3, and EOS-4 (RISAT-1A) satellites, to identify rare cases of image artifacts caused by such interference, and in some cases to prevent the interference by re-planning acquisitions.

(For oral presentation).

Preferred sessions for this paper, in order of priority:

1. Calibration of Running Missions