



Report on CEOS WGCV SAR Subgroup Activities

Presented at

**26th CEOS WGCV Meeting
Chiang Mai, Thailand
October 31 – November 3, 2006**

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CEOS WGCV SAR Subgroup (1)

- Mission: to foster high-quality synthetic aperture radar imagery from airborne and space borne SAR systems through precision calibration in radiometry, phase, and geometry, and validation of high level products.
- Objectives:
 - Act as a forum for international technical interchange on the evolving methodologies, techniques, and equipment of SAR data processing, calibration and validation,
 - To determine standard definitions and calibration-validation requirements for SAR systems.
 - To support changes in CEOS formats and user products as appropriate,
 - To facilitate international cooperative programs in the calibration and validation of SAR systems,
 - To educate the SAR community.

CEOS WGCV SAR Subgroup (2)

➤ Action Plan:

- Annual Workshop/Meeting
- Set up standard CAL/VAL sites – inter-sensor comparison
- Calibration requirements and techniques for Polarimetry, Interferrometry, POLInSAR

➤ Recent Annual Workshop/Meeting

- 2006 – Coordinated by University of Edinburgh in Edinburgh, UK
- 2005 – Jointly Coordinated by DSTO and University of Adelaide in Adelaide, Australia
- 2004 - Coordinated by ESA in Ulm, Germany
- 2003 – Coordinated by CSA in Saint-Hubert, Canada
- 2002 – Coordinated by BNSC in London, UK



14th CEOS SAR CAL/VAL Workshop/Meeting (2006)

- Coordinated by The Edinburgh Earth Observatory, The University of Edinburgh (LOC Chair: Dr, Iain H. Woodhouse)
- Held on October 4 - 6, 2006 in Edinburgh, UK
- Forty Participants from Thirteen Countries
- Six Presentation Sessions (ALOS-PALSAR, ERS & ENVISAT, RADARSAT, TerraSAR-X & TANDEM-X, Future Systems and POLSAR & INSAR)
 - 31 Presentations Made
 - Each Presentation Session Concluded with a Session Discussion and Recommendations to WGCV
- Workshop Preceded by a Tutorial on Calibration and Validation of Radar for Snow and Ice Studies on October 3, 2006
- Workshop Proceedings being produced and then distributed on CD by The Edinburgh Earth Observatory



Recommendations from SAR Subgroup (1)

- 14th CEOS SAR Workshop/Meeting concluded with a Set of Recommendations as follows:
- Initial results presented at the workshop suggest that for L-band acquisitions taken during night time the Faraday rotation does not seem to be a problem in phase calibration. However, it is recommended that effort be invested into monitoring for extreme events
- In order to reduce the extent of the commissioning phase of space borne SARs, effort be invested as much as possible into pre-launch calibration (e.g. antennas, TR modules, etc)

Recommendations from SAR Subgroup (2)

- Data providers should investigate new product types that provide complex data in which the noise has been removed
- In order to facilitate the use of calibrated SAR data (and to avoid the problem of continuously changing data formats), the data providers should provide:
 - a reader on the data CD itself
 - a LUT of calibration conversion factors for each pixel across a swath to covert DNs to sigma nought, beta nought and gamma
- CEOS should co-ordinate a central database to log the use, location and availability of corner reflectors, in order to increase the availability of calibration targets to other agencies for appropriate SAR sensors

Recommendations from SAR Subgroup (3)

- Future SAR Missions should be capable of full polarimetric imaging and at different frequencies
- CEOS should encourage the availability of tools to assess the quality of data. (This is to be a topic for discussion at the future workshop)
- TerraSAR-X be used to characterise the X-band characteristics of the Amazon for use in future calibration



14th CEOS SAR CAL/VAL Workshop/Meeting The University of Edinburgh, UK, October 4-6, 2006



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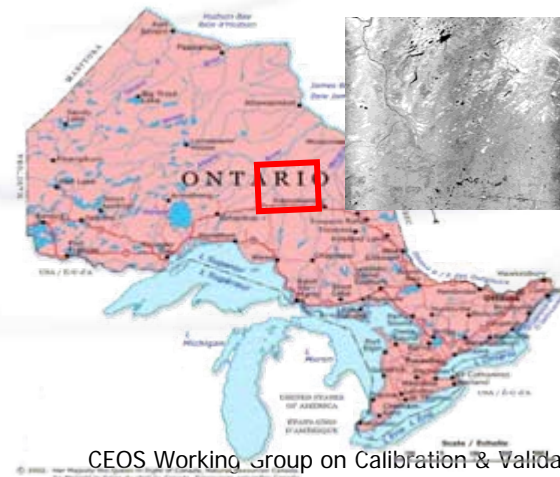
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Next CEOS SAR CAL/VAL Workshop/Meeting (2007)

- Will be held in September 2007 in Vancouver, Canada
- Hosted by the Canadian Space Agency (CSA)
- To be held Jointly with CSA's ASAR Workshop 2007
- Announcement will be forthcoming
- Contact: Dr. Satish Srivastava at Satish.Srivastava@space.gc.ca

Calibration Sites (1)

- International Amazon Rainforest Site
 - Data is routinely collected and analyzed for calibration monitoring of SAR satellites including RADARSAT-1
 - Radiometry of the site remains stable
- Canadian Boreal Forest Site
 - Radiometric characterization of the site including seasonal dependence is continuing using RADARSAT-1 data



Calibration Sites (2)

- Multi-Transponder Sites in Canada
 - ESA recently relocated an ENVISAT ASAR Transponder in Resolute Bay in vicinity of the RADARSAT-1 Transponder site
 - Both Transponders are used simultaneously by ENVISAT
 - Similar relocation of another ENVISAT ASAR Transponder expected soon in Ottawa
 - Potential sites for C-band inter-sensor comparisons (e.g., RADARSAT-1 and 2, ENVISAT)

