

CEOS WGC V SAR subgroup workshop

London, UK, 24 to 26 September, 2002

CEOS WGC V 20, 12 to 14 February, 2003, Hobart,
Tasmania.

The QinetiQ logo is located in the bottom right corner of the slide. It consists of a blue curved shape, resembling a stylized wave or a partial circle, with the word "QinetiQ" written in white, italicized, sans-serif font across its center.

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Participation and programme

- Approx 40 participants, Europe, Japan, Canada.
- Three technical sessions:
 - SAR calibration techniques - 6 papers
 - ENVISAT ASAR calibration - 8 papers
 - SAR polarimetry - 5 papers
- Invited session - objectives and programme of WGCV
- Round table discussions

Key points - session 1 (ERS, RADARSAT)

- Existing SAR systems (ERS, RADARSAT) have been both reliable and within specification,
- Similar calibration techniques were used and many lessons learnt, eg, saturation, scalloping,
- High quality transponders accepted as a means of radiometric calibration,
- Amazon forest accepted as a means of antenna gain calibration,
- Analysis of error sources in SRTM has allowed high quality DEM to be produced,
- Concerns:
 - intercomparison between ERS and RADARSAT
 - traceability of transponders to primary standards
 - provision of long term data sets of key sites (eg, those used by other WGCV groups)



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Key points - session 2 (ENVISAT)

- Despite complexity of active antenna, the internal calibration scheme has worked well.
- A number of problems have been resolved (eg, artifacts in internal cal pulses).
- All modes have been exercised, including wide swath and dual polarimetric modes. Good interferograms have been produced.
- Issues:
 - is external calibration necessary, is internal calibration adequate?
 - what changes to the ASAR process might be proposed for future active antenna SARs (especially polarimetric SAR)?

Key points - session 3 (Polarimetry)

- Faraday rotation has significant impact on the measurement of back scatter and (for low frequency SAR) could cause errors in biomass estimates - need to know TEC
- New techniques developed for classification of targets using polarimetric decomposition based on symmetric coherence
- Polarimetric interferometry can potentially estimate tree heights but requires design to reduce cross talk rather than precise calibration
- Issues:
 - Use of polarimetric SAR requires design to minimise cross talk (-30dB) but the requirement for radiometric calibration is less clear. Should form specific topic at next workshop.

Recommendations - 1

- The SAR subgroup should set up calibration and validation reference sites to:
 - provide easy access to reference calibration data to data providers
 - show mutual compatibility between different SAR systems
 - demonstrate quantitative and qualitative quality of SAR data
- Space Agencies should continue to improve the quality of polarimetric SAR data by exchange of technical information on the development of calibration and imaging algorithms and techniques.
- The stability of the Amazon rainforest should be systematically studied using existing SAR data sets.

Recommendations - 2

- The next meeting of the SAR subgroup should focus on the problem of full polarimetric SAR calibration
- Space agencies should ensure that calibration processes for SAR are traceable to the primary standards