ALOS-PalSAR Pol- & Pol-InSAR Data Calibration Analysis

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Wavelength 0.236 m
Chirp Bandwidth 14 MHz
Peak Transmit Power 2 kW
Duty Cycle 3.5% (7% / 2)
Noise Figure 4 dB
Antenna Size (Tx, Rx) 8.9 m x 3.1 m
Quantisation 5 bit (BAQ)

Launch date Januar 2006
Weight 4000kg
Solar Power ~7Kw@EOL
Orbit Sun Synchronous
Altitude 691.65 km
Revolution 14+27/46
Yaw steering ON
Inclination 98.16 degrees
Attitude error 0.4e-4°
CAL-VAL CAMPAIGN

- Two Test Sites: Oberpfaffenhofen & Traunstein
- May until November 2006
- Total of 40(1) acquisitions

Deployed Reference targets:
- 6 x 3m trihedral reflectors
- 2 x 1.5m trihedral reflectors
- 2 x 1m dihedral reflectors
- 2 x L-band transponders
PolSAR Calibration Results Summary

- **X-Talk Level**: -18 to -22dB
- **Co-Channel Imbalance A**: ~0.5-1.0 dB (TbS)
- **Co-Channel Imbalance P**: ±5° to 10°
- **SNR Forest**: ~16dB, $\gamma=0.9-0.95$
- **SNR Surfaces**: 0dB, $\gamma=0.5$
- **Faraday Rotation**: 0° to 5°
ALOS-PalSAR PolSAR Results

Forest Con

Agriculture

Cycle 6

Cycle 7

Cycle 8

Forest Broad

ALOS-PalSAR InSAR Results

Cycle 5-6

Cycle 6-7

Cycle 5-7
Coherent Scatterers

Red: Dihedrals
Green: Dipoles
Blue: Flat Plates

ALOS-PalSAR InSAR Results

Cycle 5-6  Cycle 6-7  Cycle 5-7
ALOS-PaLSAR InSAR Results

ALOS-PaLSAR Pol-InSAR Results
ALOS-PalSAR Pol-InSAR Results

Estimated Height: ~34m ~37m
Reference Forest Height: ~20-25m ~20-25m
Temporal Decorrelation: ~0.65-0.75
Comments & Conclusions

- ALOS PalSAR Quad-Pol Quality is excellent and within the Specs.
- CAL/VAL campaign successfully performed.
- Scientific value on the temporal evolution of polarimetric properties of scatterers.
- **It is important to secure the acquisition of Quad-pol time series on selected TS sites.**
- ALOS PalSAR InSAR Quality is almost excellent – Baseline Control & T-deco.
- Pol-InSAR applications limited due to the InSAR limitations of the system.
- Pol-InSAR (quantitative) product generation only on opportunity basis.
- Successful demonstration of Pol-InSAR applications is encouraging.
- Methodology development for facing temporal decorrelation effects is ongoing.

**ALOS–PalSAR Pol-INSAR Test-Sites**

Helsinki Finland Boreal Forest
Traunstein Germany Temperate Forest
Ebersberger Forst Germany Temperate Forest
Injune Australia
Belize Belize Tropical Forest
Borneo Indonesia Tropical Forest
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