ASCAT - Metop A developments, Metop B preparations & EPS-SG

Hans Bonekamp, Craig Anderson, Julia Figa & Julian Wilson
ASCAT Metop A - overview

- Instrument operating nominally (minor incident in Jan 2011 when testing switch for back up electronics)
- Calibration report for 2010 campaign available
- Improved Kp estimation algorithms in ground processing
- ESA/EUMETSAT scatterometer science conference April 2011
- Full resolution data planned for NRT distribution
- Next transponder campaign planned Oct/Nov 2011
- 35th ASCAT SAG meeting likely in Nov 2011
ASCAT Metop A - cal/val activities

- Second in summer 2010
- Third in Oct/Nov 2011

\[ \gamma_0 \text{ over rainforest has stronger incidence angle dependence than ERS scatterometers.} \]

- Implications for intercalibration, climate products.
updated SZF product
(more compact, lat/long grid)

Archive and NRT:

- **SZO**: 50 km (Hamming window)
- **SZR**: 25 km (Hamming window)
- **“SZC”**: 15 km (box window)
- ? “SZL”**: 15 km (land averaging)

- **Level 2 Wind**
- **Soil Moisture**
- ? **Level 2 Soil Moisture**
- ? **Level 2 Soil Moisture In demo**
- Coastal Winds
- In demo

GLOBAL NWP, Operational

IOVWST meeting, May 2011
• highlight the successes achieved with ASCAT on Metop and the Active Microwave Instrument on ERS

• assess current and future challenges of processing, calibration and validation

• discuss applications in a multi-mission scatterometer context

• provide guidance on reprocessing, climate issues and intercalibration of the sensors with other scatterometers

• address scientific issues of the proposed ASCAT follow-on mission

• involve a wider scientific and user community
The Metop-B spacecraft is scheduled for launch on 2nd April 2012.

ASCAT has passed all testing, has been installed on Metop B and currently in storage in Toulouse.
Metop-B summary information

- Metop-B identical to Metop-A
- Metop-B launch planned April 2012
- Commissioning planned to last 4 months
- Preparations under way
- SIVVRR successfully held in December 2010
- SIVVR planned in September 2011
- LORR in December 2011
- Launch campaign first quarter 2012
- Same orbit (9:30 AM descending node), phased 48.93 min apart from Metop-A.
Metop A and B orbit phasing

- Users want maximum coverage and optimised temporal sampling for NWP and climate monitoring

- Constraints
  - ground station (Svalbard) can only support one satellite at a time
  - RF interference of active instruments requires separation of at least 21 min
  - ASCAT transponders require exact repeat phasing, i.e. possible separation limited to 27.96, 31.46, 34.95, 38.45, 41.94, 45.22 or 48.93 min

- Adopted phasing is 48.93 min (approx 1/2 orbit, not optimum for ASCAT coverage but better for other instruments and ground segment)
ASCAT Metop-B ocean vector winds constellation

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Ku-band

C-band

Launch Date

10/06

6/99

Combined C- and Ku-band

Design Life

Extended Life

Designed

Proposed

METOP-A Europe

METOP-B Europe

METOP-C Europe

EPS SG Europe

QuikSCAT USA

Oceansat-2 India

ScatSat India

CFOSat China/France

HY-2A China

HY-2B China

Meteor-M3 Russia

GCOM-W2, -W3 with DFS Japan/USA

FY-3E with 2FS China

Operational Series with 2FS India
Two satellites concept: Sun-synchronous orbit (~817 km altitude) 09:30 descending node

Sounding/imaging, satellite A, launch ~ 2019

Payload
- METimage
- IASI-NG
- ATMS (or MWS)
- 3MI
- Sentinel-5
- CERES
- RO

Ocean wind/precipitation, satellite B, launch ~ 2020

Payload
- SCA
- MWI-Precipitation
- MWI-Cloud
- ARGOS-4
- S&R
- SEM
- RO
2005: EPS-SG Phase 0 process started at EUMETSAT
2008/2009: ESA’s industrial Phase 0 studies (Astrium SAS and Thales Alenia Space Italy)
Output: 2 satellites concept (SCA on Satellite B)
2010: EUMETSAT Phase A process started
2011: ESA’s industrial Phase A studies started (Astrium SAS and Thales Alenia Space France)
2019: Projected launch of 1st Satellite A
2020: Projected launch of 1st Satellite B
EPS SG scatterometer – way forward

- High-resolution level 1b product with 6.25 km sampling, resolution TBD (but shall not drive the instrument design or cost)

- Addition of VH or HH polarisation. Various options under consideration include
  - VH on fore and aft beams
  - VH on mid beams
  - HH on fore and aft beams
  - HH on mid beams

- Model functions for C band HH and VH required for high wind speeds (airborne campaigns?)
ASCAT Metop A, Metop B, EPS SG

Questions and further information from

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