SLSTR Breakout Summary - Gary Corlett (22/03/2012)

[Updated 16/04/2012 with post meeting comments from Gorm Dybkjær, Simon hook and David Meldrum]

The breakout session started with a clean slate and identified a set of cal/val activities for SLSTR. The session focused first on when activities should be done (pre-launch, post-launch etc.) and then on each product (Level 1b/1b, SST, LST and Synergy)

Pre-launch

Distribute demonstration products (synthetic datasets) - essential

Cal/val protocols/methodologies to be defined and agreed and documented - essential

Develop cal/val tools (including predicting simultaneous nadir overpasses, SNOs) - essential

Carry out dry-runs (rehearsals) - essential

Calibration workshop – essential

Cross-calibration of laboratory black bodies with transfer (TXR) and field radiometers (traceability to national standards) – essential

Distribute spectral profiles; retrieval coefficients; calibration numbers (non-linearity, etc.); central website for dissemination - essential

Finalise at launch algorithms - essential

Define E1 (commissioning phase) timeline (operations and data availability) - essential

Develop (and validate) tool for sun glint calibration and drift monitoring (built for long-term use); consider ad-hoc tools for E1 - desirable

Prepare data gap (AATSR to SLSTR) mitigation strategy – essential – should start now

Launch/E1

Validate thermo-elastic model - essential

Calibration activities (see SY5) - essential

Ortho-geolocation validation (includes alignment of nadir and oblique views) - essential

Co-registration with OLCI- essential

Vicarious calibration; cross calibration with OLCI; early cross-calibration opportunities – SNOs, AATSR etc, IASI; systematic extractions - essential

Systematic extraction over Tahoe/Salton Sea and pseudo invariant sites for Level 1b/1c in E1; in situ SST from drifters needed for SSES generation; systematic extraction for moored buoys; ARM sites for LST - desirable

Talk to Sasha Ignatov – incorporate into NOAA tools - desirable

Additional support activities for In Orbit Commissioning Review (IOCR) – vicarious calibration; comparisons to AATSR/IASI; intercomparison of Level 2 SSTs - desirable

Release products (Level 2) to select cal/val experts as soon as level 1b reliable; - desirable

Confirm Sensor Specific Error Statistics (SSES) model for L2P (matches to drifters); inter-algorithm offset adjustment - desirable

Good communication (website, wiki, forum, mailing list, RSS feed) in all directions - essential

Transition from E1 to E2 needs to be overlapping (transfer of tools/skills/documentation) - essential

E2 (release of data)

Starts with first cal/val workshop – for release of products to all users - essential

Calibration team to support validation team- essential

Campaigns to look at VIS/SWIR channels- essential

Continue calibration tasks from E1 (must cover at least one year before initial calibration tasks are completed) - essential

Systematic extraction to continue- essential

Continue to populate match-up dataset using GTS data etc- essential

Add in validation team contributions to campaign databases; create match-ups - desirable

Produce validation analyses; communicate results - essential

Hold second cal/val workshop – essential

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Level 1b/1c calibration

Radiometric (essential):

TIR – 'self' calibrating; monitor key parameters (non-linearity, gain, offset, T, noise, …)

Black-body X-over test (repeated at yearly intervals)

SWIR – 'self' calibrating; monitor key parameters (as TIR); populate auxiliary data files, ADFs, (mechanism TBD)

VIS – 'self' calibrating; as SWIR; cross calibration with OLCI (band matching; request from OLCI once per year)

First light test of VISCAL – before cool-down; look at quasi-invariant sites (systematic extractions)

Absolute calibration of 1.3 (use SNOs) and 2.2 (as 1.6) channels

FIRE channel (sun glint); adjust FIRE channel gains to use on-board BBs; check linearity

Normal and fire channel relative-registration (use point sources e.g. gas flares)

Normal and fire channel relative-calibration (use open ocean clear-sky and other uniform scenes)

Stray light monitoring (baffle thermal variability impact on TIR radiometry); look out for scan dependent variations in BT in SST; also stray light over gas flares /fires (BTs > 350 K)

Cross-comparison of optical chains – use impact on SST; use Tahoe

Cross-comparison between S3A/S3B

In situ campaigns and networks to provide reflectance (e.g. Railroad Valley, Australia, Dome C)

Set-up in E1 and continue into E2

Geometric (all essential):

TDI - alignment of A and B geolocation (SWIR)

Inter-channel co-registration – using bright targets etc.

Validate thermo-elastic model (with OLCI – ground control points - to populate ADF)

Co-registration of SLSTR oblique view with OLCI

Sustained activity to validate and provide evidence of miss-registration throughout mission

Spectral:

Cross-compare with IASI for TIR; GOME-2/SCIA for VIS/SWIR; AATSR (with forward model and profiles) - desirable

Cross-comparison between S3A/S3B – essential

SST

Requirements:

Comparison to traceable reference data; global and regional (e.g. dust, ice, North Pacific, North Atlantic, Arctic Ocean).

Matchup database; auxiliary data; other tools

Populate SSES for L2P – methodology to be confirmed after launch

Request for sea-ice surface temperature

Practicalities:

Need a validation protocol

Drifter, moored and Argo (GTS) added routinely

Skin and diurnal adjustments required

Define priority regions for non-GTS data

Support for improvements to existing networks (e.g. funding for HRSST and HRIST drifters)

Reference site for SST – long term stability – radiometer

Other global radiometer data (need national contributions) – number TBD; concern about long-term funding for radiometers; all ensuring traceability to national standards

Interaction with DBCP, SOT Argo steering team (providing GTS data)

Validation of cloud mask

Note: need to define thresholds for switching of SST algorithm for L2P in the presence of dust or volcanic aerosols

Need to evaluate impact of increased range in local solar time

Need to evaluate impact of backward view

LST

Requirements:

Long-term in situ measurements globally regionally and by land cover classification (biome in algorithm);

Match-up database; auxiliary data; other tools

Pseudo-invariant sites for long –term monitoring and cross-comparisons (for SNOs)

Cover maximum range of emissivity (one water e.g. lake, one silicate e.g. sand dune) as soon as possible; must be correct spatial scale; must have in situ measurements; low T and high T

Validate all land cover types using in situ data within two years of start of E2 (TBC)

Practicalities:

Need a validation protocol

Identify and characterise pseudo invariant sites

Define recommendations for site radiometers (including inter-comparisons)

Define recommendations for airborne campaigns

Primary long-term sites not on guaranteed funding

ARM sites and other operational networks openly available and added routinely to MDB

Validation team contributions to be added to MDB

Support in situ with radiance validation and inter-comparisons

Validation of cloud mask

Evaluate impact of local solar time

Evaluate impact of backward view

Consideration should be given to an SLSTR emissivity product

Synergy

Requirements:

In situ data from AERONET to validate AOT; aerosol optical model (size etc)

Match-up database

Cloud mask validation (uses combined SLSTR/OLCI) – not SYNERGY mask (in current prcr) – overlap with OLCI

Validate RTM using inland water bodies

Practicalities:

AERONET available – added routinely

ASRVM

Still not sure on best RTM for atmospheric correction (current CEOS activity)

Validating BRF to ensure consistency of RTM (ongoing)

Intercomparison with OLCI and AATSR