Presentation of the CATDS : description of the SMOS L3 products generation and dissemination

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Centre Aval de Traitement des Données SMOS (CATDS)
The french ground segment for the SMOS Level 3 and 4 data

The Centre Aval de Traitement des Données SMOS (CATDS), developed by the CNES in collaboration with the CESBIO and IFREMER, is the french ground-segment facility in charge of the generation, calibration, archiving and dissemination of the SMOS science products level 3 and level 4. It processes Ocean Salinity (OS) and Soil Moisture (SM) products.

This facility is dedicated to :
• Product and distribute SMOS L3/4 products (from L1B products from the ESA Data Processing Ground Segment)
• Reprocess SMOS L3/4 products
• Provide services & hot-line support to L3/4 users
• Develop, test and validate algorithms for L3 and L4 processing chains, in close cooperation with the scientific community
• Propose improvements of the L0 to L2 processing chains (possibly helping to fine tune the calibration aspects) ; once validated, these algorithms will be proposed for a transfer to ESA Data Processing Ground Segment.

CATDS is split in two main types of components :
• a C-PDC (Production Centre) which routinely produces and disseminates L3 and L4 data from L1B and auxiliary data. It is located at SIMBER (IFREMER) in Brest.
• 2 C-EC (Expertise Centre) which host the co-located algorithms definition and processors development, which will assess the quality of the products and will give specific information to users. These two C-ECs are located at CERSAT in Brest (C-EC dedicated to Ocean Salinity) and at CESBIO in Toulouse (C-EC dedicated to Soil Moisture).

The CATDS processing chains

The CATDS processing chains generate SM and OS L3 data from DPGS L1B products[1].

The CATDS processing chains

The C-EC SM :
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  - Polarimetric brightness temperature at ground level, daily global file
  - TOA brightness temperature
  - Meteorological daily global product
  - L3 SM User Data Product, daily global product
  - L3 SM User Data Product, monthly global product
  - Interim product OS L3P - Valid Ocean Salinity values
  - L3 OS product - Average Salinity values
  - L3 SM product - Monthly Global Maps
  - L3 OS product - Average Salinity values

The C-EC also generate research products[1]. These research products are subject to limited distribution.

The C-PDC L3 products

The 3 day/10 day/monthly global map of ISSM products. The 3 day/10 day/monthly global products result from time aggregation of daily global maps. An inversion algorithm is also performed in order to flag the data aggregation of ISSM products.

CATDS L3 products distribution

The CATDS web site www.catsd.fr presents the distributed L3 products and gives information relative to the production.

The distribution of products

The operational production began at the beginning of June 2011. The first reprocessing was performed during spring 2012. For now the retrieval is made via a FTP site (see information on http://www.catsd.fr/Products/Products-access). Another dissemination service (SIPAD - allowing criteria research and geographical sub-setting, www.catsd.fr/sipad) will be available in October 2013.

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L3 SM User Data Product, daily global product
An inversion algorithm is applied to the set of the brightness temperatures from global daily L1C. This processing is an iterative scheme performed in order to retrieve a quadratic soil fraction function. Several constraints are taken into account: emissivity correction, surface albedo, surface roughness, land cover types, soil moisture reference level : several ratios are taken into account simultaneously. This algorithm involve the robustness of the retrieval of the geophysical parameters.

SM and OS global products keep the same grid (and then the same resolution) than daily global L1C.

TOA brightness temperature
- Daily global file

Meteorological daily global product

L3 SM User Data Product, daily global product

An inversion algorithm is applied to the set of the brightness temperatures from L1C. The processor includes 3 iterative models for surface roughness (two scale model, SSA model and empirical) and 1 iterative model for surface temperatures from L1C. The processor includes 3 iterative models for surface roughness (two scale model, SSA model and empirical). A detection of particular events is also performed in order to flag the data aggregation of ISSM products.

Users/scientists are invited to contact us for orders or to meet the CATDS team during the upcoming in October 2013.