SMOS L1 Processor Prototype

Test Data Set 6.0.0 description

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1. INTRODUCTION

1.1. Purpose and Scope

This short note lists the contents of the Test Data Set for the L1PP v6.0.0. It is intended as a high level description, leaving a full description of the tests to the Validation Report document.

1.2. Acronyms and Abbreviations

APID	Application program identifier
CFI	Customer Furnished Item
DPM	Data Processing Model
EE	Earth Explorer
EEFH	Earth Explorer File Handling CFI (ASCII XML library)
GUI	Graphical User Interface
HKTM	HouseKeeping Telemetry
HTML	HyperText Markup Language
L1PP	Level 1 processor prototype
LCF	LiCeF (LIghtweight and Cost-Effective Front-end)
LO	Local Oscillator
MIRAS	Microwave Imaging Radiometer with Aperture Synthesis
NIR	Noise Injection Radiometer
OBET	On Board Elapsed Time
PLM	PayLoad Module
PMS	Power Measurement Signal
SEPS	SMOS End-to-end Performance Simulator
SMOS	Soil Moisture and Ocean Salinity
SVP	Software Validation Plan
TBW	To Be Written
UPC	*Universitat Politècnica de Catalunya* (Technical University of Catalonia)
XML	Extended Markup Language

Table 1: Table of Acronyms.

1.3. Applicable and Reference Documents

Ref.	Code	Title	Issue
AD.1	SO-TR-DME-L1PP-0271	SMOS L1 Processor v6.0.0 System Validation Report / Acceptance Test Report	*1.0*

Table 2: Applicable Documents.

2. TEST DATA SET V6.0.0 CONTENTS

For this release of the Test Data Set, the scenarios were chosen in order to keep the dimension of the TDS reasonable and of a manageable complexity, while still exemplifying all the relevant cases. The TDS contents are exactly the same as for TDS 5.5.0, in order to be able to make direct comparisons, with the exception of specific tests designed to demonstrate the impact of new implementations.

Data was selected from the data base available from dpgs-l0 ftp servers at ESAC, covering the period between 13th-Jan-2010 until 31st-Jan-2010.

All scientific scenarios were processed with L1PP v6.0.0 using:

- Offset correction on baselines sharing the same LO;
- Reference temperature set 0 (Tref 0);
- Gibbs 1 reconstruction algorithm;
- Applying all the Foreign Sources corrections **except** Sun Glint;

For each (segment of an) orbit in measurement mode to be processed, L1PP v6.0.0 shall ingest:

a) the closest long and external calibration events prior to the orbit and;

b) the PMS short sequences to update PMS offset values and;

c) the LO calibration relative to the orbit to be processed.

In this campaign the scenarios have been updated to include full orbits. The list of tests performed, which covers the previous functionalities, is presented in the table below. For more information on the test contents and results, please refer to [AD.1].

Table 3: List of tests proposed for TDS 6.0.0

Type	Description	Internal Code
System Tests / Calibration Processing and Consolidation Tests	Test processing from L0 to L1a using external calibration and NIR Calibration.	genANIR
	Test processing from L0 to L1b using external calibration data and external target manoeuvre, including FTR in Dual polarisation.	genFTTD
	Test processing from L0 to L1b using external calibration data and external target manoeuvre, including FTR in Full polarisation.	genFTTF
	Test Generation of G and J Matrices from L0 data	genMatr
	Test processing of all calibration files needed for the scientific testing	gencalFiles

Type	Description	Internal Code
Scientific Validation Tests	Test processing from L0 to L1c data acquired in measurement mode in Dual polarisation with LO injection every 6 minutes. Full ascending orbit over Australia.	austD
	Test processing from L0 to L1c data acquired data in measurement mode in Dual polarisation with LO injection every 6 minutes. Full ascending orbit over Europe.	euroD
	Test processing from L0 to L1c data acquired data in measurement mode in Dual polarisation with LO injection every 6 minutes. Full ascending orbit over the Pacific Ocean.	pacfD
	Test processing from L0 to L1c data acquired in measurement mode in Full polarisation with LO injection every 6 minutes. Full ascending orbit over Australia.	austF
	Test processing from L0 to L1c data acquired data in measurement mode in Full polarisation with LO injection every 6 minutes. Full ascending orbit over Europe.	euroF
	Test processing from L0 to L1c data acquired data in measurement mode in Full polarisation with LO injection every 6 minutes. Full ascending orbit over the Pacific Ocean.	pacfF
Reference tests	Test processing from L0 to L1c data acquired data in measurement mode in Full polarisation with LO injection every 10 minutes. Two ascending orbits with 3211 scenes over the Pacific Ocean.	pacfF-OS
	Test processing of one full day of data	test-oneday

As for the delivery of TDS, it is proposed to deliver a single TDS to all users, with the following contents:

TDS	Scenarios	Contents
TDS-L1PP V6.0.0	genANIR, genFTTD, genFTTF, genMatr, genMatr, genLongCalib, austD, euroD, pacfD, austF, euroF, pacfF, pacfF-OS,test-oneday	Products, breakpoints (when applicable) and logs

The scenarios will be provided, packed separately, through the SMOS L1PP webpage[1].

[1] http://www.smos.com.pt/project_data_products.html

3. TEST DATA SET V6.0.0 USAGE

For this release of the Test Data Set, the scenarios have been updated to be better synchronised with CEC/IDEAS test environment. This meant going for full orbits of data, which has created a new set of dependencies between tests. Below is a description of the order in which the tests have to be run, so that all available data is present for each scenario (e.g. calibration must be processed before science data):

The recommended order for the tests is:

- Core tests (common between Dual and Full Polarisation data)
  - Generation of NIR calibration data from external measurements (genANIR);
    - This test must be executed twice by moving data in the "processed-data" and "unprocessed-data" directories back to "l1a-in" directory and re-running the test
  - Generation of G and J Matrices from real instrument data (genMatr);
- Dual polarisation Tests
  - Generation of Flat Target Transformation data for Dual pol mode (genFTTD);
  - Processing Australia (dual polarisation);
  - Processing Europe (dual polarisation);
  - Processing Pacific (dual polarisation).
- Full polarisation Tests
  - Generation of Calibration data (genCalFiles-2012);
  - Generation of Flat Target Transformation data for Full pol mode (genFTTF);
    - This test must be executed twice, by moving data in the "processed-data" and "unprocessed-data" directories back to "l1a-in" directory and re-running the test
  - Processing Australia (full polarisation);
  - Processing Europe (full polarisation);
  - Processing Pacific (full polarisation).
- Reference Tests
  - OS reference test
    - Generation of NIR calibration data from external measurements (genANIR-20100714);
    - Generation of Long Calibration data (genLongCal-20100714);
    - Generation of NIR calibration data including Cross-Polar and Leakage and calibrated L1 factor (genANIR+CalL1-20100714)

- Generation of Flat Target Transformation data for Full pol mode (genFTTF-20100710);
- Processing full Pacific orbit (pacF-OS).

- IDEAS integration test (one day of data)
  - Generation of preliminary input Calibration Data (genPreCalFiles);
  - Generation of Calibration data (genCalFiles);
  - Processing full day of data (test-oneday).

To ease the execution of this long chain of tests, with all the described dependencies, test scripts are provided with the TDS. The user is strongly encouraged to adapt these scripts to his own needs (executing only parts of the processing, moving data processed, etc.).