
	<h1>L1 T MSS Product Radiometric Stability</h1>	
	<p>Landsat SLAP products SLAP SW V3.03</p>	
<p>Ref: IDEAS_Landsat_MSS_SL AP_V303_20131115</p>	<p>Issue/Rev: 1/0</p>	<p>Date: 16/11/2013</p>

1 Subject

The report covers the product validation stage of L1G products output from SLAP V3.03.

2 Executive summary

This document, version 1.0, reports the last validation results obtained over a sample of SLAP V3.03 products.

Validation Item	Comment
Radiometric Calibration Stability	<p>Over 8 years of data (15 products), the computed TOA are consistent, stable in time and at first glance in agreement with USGS ones. The stability can be summarized as follow</p> <ul style="list-style-type: none"> • Band 1 – 1.0 % • Band 2 – 2.3 % • Band 3 – 1.9 % • Band 4 – 1.3 %

Table 1. - Executive summary.

Product Validation

Landsat SLAP products
SLAP SW V2.3

3 Input data

The following TDS has been considered, all L1T MSS data observed ober Libya 4, path / row, 181 / 40

Product File Name	Year	Doy
LM51810401984107ESA00	1984	107
LM51810401984187ESA00	1984	187
LM51810401984203ESA00	1984	203
LM51810401984219ESA00	1984	219
LM51810401985189ESA00	1985	189
LM51810401985221ESA00	1985	221
LM51810401985317ESA00	1985	317
LM51810401986240ESA00	1986	240
LM51810401986256ESA00	1986	256
LM51810401986320ESA00	1986	320
LM51810401988022ESA00	1988	022
LM51810401988038ESA00	1988	038
LM51810401988086ESA00	1988	086
LM51810401991238ESA00	1991	238
LM51810401991286ESA00	1991	286

Table 2. Input TDS – list of products.

The output product format is 'geoTiff' such as defined in [LS DFCB V4.0].

4 Analysis Methodology

Product Validation

Landsat SLAP products
SLAP SW V2.3

The methodology is explained in ¹. The processing consists in monitoring the Top Of Atmosphere reflectance acquired over a bright stable site as a function of time for a same view acquisition and sun illumination acquisitions.

5 Results

According to methodology explained above, the results are listed in table below. The results are correct taking into account the ageing of the instrument. A comparison between ESA and USGS products has not been done. However, looking at existing records (past studies), the accuracy deduced from ESA products is conformed with the accuracy deduced from USGS product.

	band 1	band 2	band 3	band 4
Mean TOA Values	0,34438	0,4151	0,45432	0,44581
Standard Deviation	0,10052	0,23621	0,19132	0,13633

Table 3. Radiometric stability results.

¹ M. Bouvet, F. Ramoino, "Radiometric intercomparison of AATSR, MERIS and Aqua MODIS over Dome Concordia (Antarctica)", In Can. J. Remote Sensing, Vol. 36, No. 5, pp. 464–473, 2010.

Product Validation

Landsat SLAP products
SLAP SW V2.3

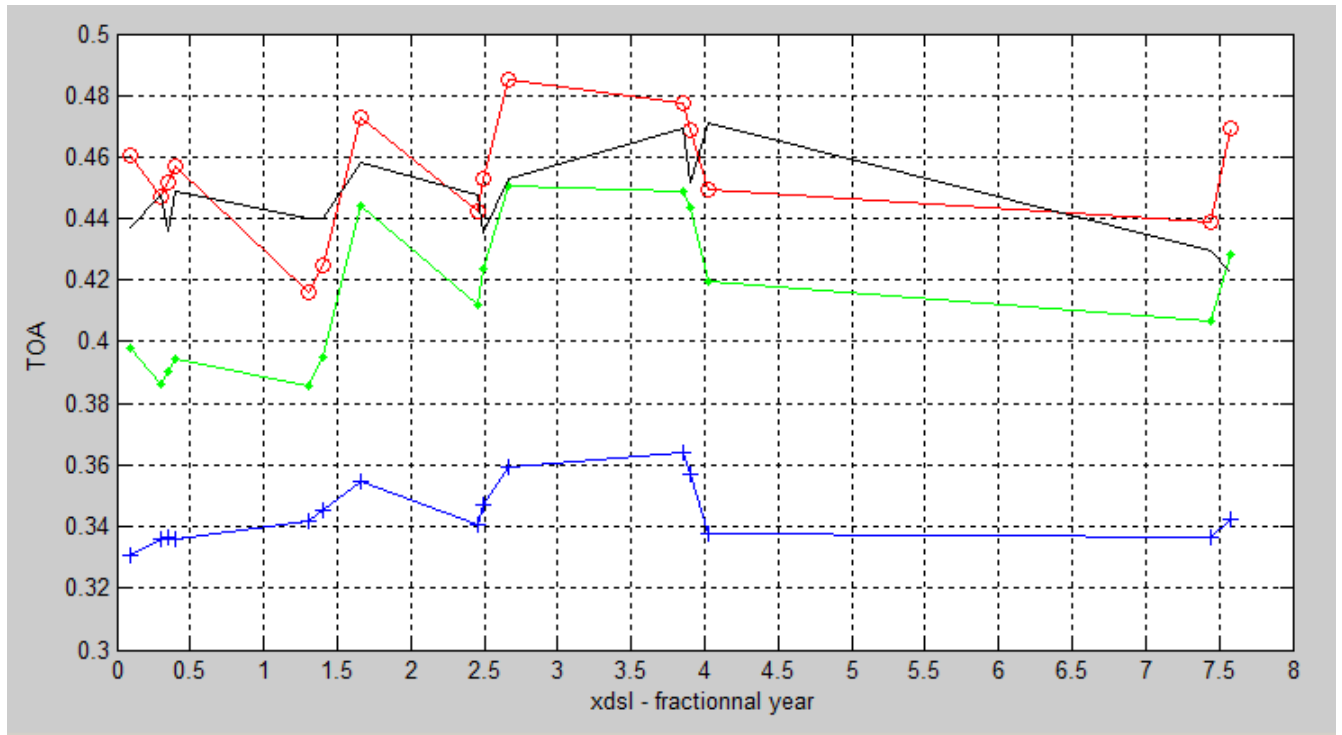


fig 1. MSS TOA Values - Radiometric stability over 8 years.

Figure below show spectral profiles over Lybia 4. For a given central wavelength, variability is observed. This variability needs to be investigated, intrinsically to MSS instrument, more data is needed.

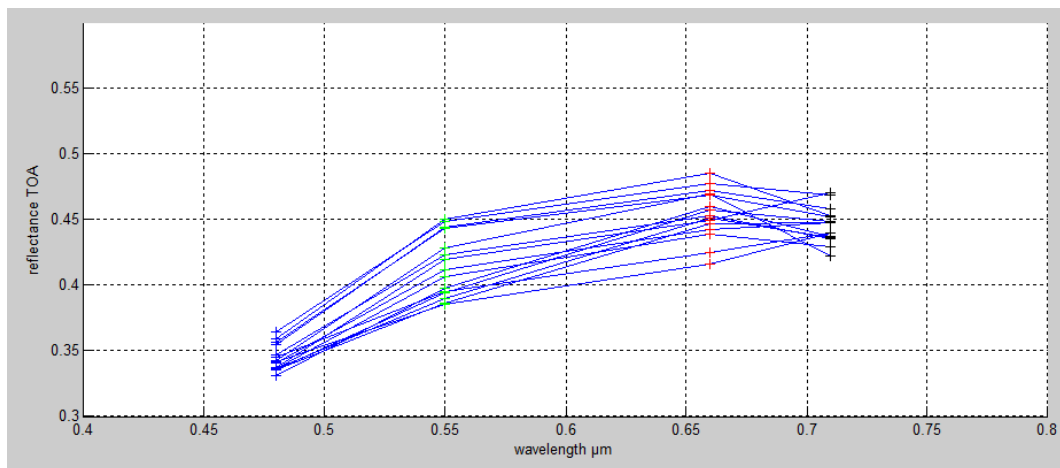


fig 1. MSS TOA Values - spectral curve over 8 years.

Product Validation

Landsat SLAP products
SLAP SW V2.3