



ADM-Aeolus Level-2b Processor Test Plan

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ADM-AEOLUS LEVEL 2B PROCESSOR TEST PLAN DOCUMENT HISTORY

This documentation was developed within the context of the ESA ADM-Aeolus L2B project. It provides documentation in the style used by the EUMETSAT Satellite Application Facility on Numerical Weather Prediction (NWP SAF) to facilitate NWP user implementation.

The partners in the Aeolus L2B processor project are the ECMWF, KNMI, and Météo-France.

Version	Date	Comment
0.1 (draft)	30 Jan 2007	First draft. Contains module testing, integration, portability, and validation testing.
0.11	31 Jan 2007	Refine validation testing. Mention that the code developers need to apply the SVVP in order to verify the SRD, and allocate a section to store validation test results.
0.2	9 May 2008	Update reference documents and directories in line with L2BP release 1.33



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1.Introduction

This document presents how the ADM-Aeolus level 2b processor (L2BP) will be tested.

The following aspects of testing are covered:

- Module tests
- Integration tests
- Validation tests
- Portability tests

1.1.Reference documents

[RD-1] AE-RN-ECMWF-L2BP-001_20080229_SRN_Iss1.33.pdf

[RD-2] AE-SAFPS-KNMI-L2BP_20070716_v0.3_ProdSpec.doc

[RD-3] AE-RS-ECMWF-L2B-001_20070223_SRD_v1.1.pdf

[RD-4] AE-PL-KNMI-L2BP-001_20070411_SVVP_Iss1.3.pdf

[RD-5] TN3.1

1.2.List of acronyms

EE	Earth Explorer
L2BP	ADM-Aeolus Level 2B Processor
PS	Product Specifications
SRD	Software Requirements Document
SRN	Software Release Note
SVVP	Software Verification and Validation Plan
TN3.1	Technical Note 3.1

2.Pre-requisites

The L2BP must first be installed at the tester's site, using the procedure described in section 3 of the SRN [RD-1], entitled "Installation".

That section defines a directory `$(BUILD)`

All following tests are performed in the test folder `$(BUILD)/Test`

3.Module tests

The testing of each module will be done via the following sequence of commands:

1. `cd $(BUILD)`
2. `make -f Makefile.aeolus cleantest`



3. make -f Makefile.aeolus test

The command number 2. above cleans all previous test results, while the command number 3. actually runs the testing for all the modules.

The following modules are tested to verify that, when invoked with *ad hoc* test programs, they return results consistent with their expected functionalities. For information, these functionalities are listed in the SRN [RD-1] Appendix A.1 entitled "File organization".

- AMD_file_handling
- Application_Client_Example
- AuxClim_file_handling
- auxiliary
- BUFR_file_handling
- BUFR_tables
- Classification
- DataStructures
- DirectBinaryIO
- ee_cfi_software
- ee_cfi_wrapper_module
- external
- HLOS_retrieval
- input_rpt
- InputScreening
- KVT_module
- L1B_file_handling
- L2B_AuxPar_file_handling
- L2BC_file_handling
- LiteTestData
- main
- Match_AMD
- MieCoreProcessing
- MolScat
- OpticalProperties
- RayleighBrillouinProcessing
- RBC_FileHandling
- Scripts
- simple_xml
- src_ecmwf
- support
- ThinLayer
- Tools

The results are indicated in the end, when all modules have been tested by the testing sequence, for example:

```
=====
summary of all tests:
nr of passed tests: 223
nr of failed tests: 0
nr of skipped tests: 9
=====
```

In that example, 9 tests were skipped, 223 were passed, and none failed.

The detailed list of passed/failed/skipped tests is contained in the file:

`${BUILD}/Test/testresults.accumulated`

Alternatively, if one chooses to target a particular module, say 'DataStructures', the following sequence of commands needs to be entered:

1. `cd ${BUILD}/Test/DataStructures`
2. `make -f Makefile.aeolus clean`
3. `make -f Makefile.aeolus test`

The module testing runs the subroutines/functions on that particular module, and compares the output with expected ones. Differences that are beyond expectation are returned as failed test. In some cases, data are read as part of the test to verify either that reading works as expected, or that processing of the data thus read works as expected.

4. Integration tests

The integration tests will be evaluated as part of the procedure above, specifically in the modules 'main' and 'Application_Client_Example'.

Should one want to reproduce these tests without running the whole module testing sequence, the following commands can be used to test only integration:

1. `cd ${BUILD}/Test/main`
2. `make -f Makefile.aeolus clean`
3. `make -f Makefile.aeolus test`
4. `cd ${BUILD}/Test/Application_Client_Example`
5. `make -f Makefile.aeolus clean`
6. `make -f Makefile.aeolus test`

Steps 3. and 6. above will return series of 'passed' or 'FAILED' messages, indicating whether the tests are passed. Occurrences of 'FAILED' indicate a problem in the integration testing.

The integration testing verifies that the L2BP as a whole behaves as expected.

This is done both for the standalone version (program main/L2B_program) and for the subroutine version (Application_Client_Example/application_client_example).

All the L2BP functions are thus tested, including reading input data, processing, and writing output data. The program standard outputs are verified by comparison with expected outputs.

5. Validation tests

5.1. Testing by the code Developers

Validation tests will be conducted first by the software Developers to check that all the specifications listed in the PS document [RD-2] are met.

The requirements listed in the PS [RD-2] include requirements listed in the SRD [RD-3]. These requirements will be tested by applying the sequence of tests listed in the SVVP [RD-4].

As for the requirements that are listed in the PS [RD-2] but not in the SRD [RD-3], they will be verified by code inspection.

The results of all the validation tests conducted by the code Developers shall be listed in the Appendix A of the present document.

5.2. Testing by Beta-Testers

The L2BP will be released to beta-testers shortly before the launch of the ADM-Aeolus satellite.



Beta testers will bear the following responsibilities in validation testing:

- To review the ADM-Aeolus L2BP documentation
- To verify that the software can be installed on their hardware platform, and seek immediate assistance if some sections of the software do not compile or if suspicious messages are returned by the compiler
- To verify that the tests are passed, and to report any problems if necessary
- To verify that the package achieves the requirements specifically mentioned in the PS [RD-2] as additions to those of the SRD [RD-3]
- To verify that the L2BP processes the difficult cases (as identified in the technical note TN3.1 [RD-5] and provided as part of a Test Data Set), according to results documented in the document TN3.1 [RD-5].

The list of beta testers still needs to be determined. It is expected that users external to the developers' list will be solicited.

The results of testing conducted by beta-testers will be listed in the Appendix B of the present document.

6.Portability tests

Portability tests will be conducted on several platforms. On each platform, the test will consist in

1. Installing the software
2. Running the whole module testing sequence, which includes integration testing

The results of portability tests will be listed in the SRN [RD-1] section 2.5 entitled "Testing performed".

Appendix A. Developers Validation Test Log

This section will contain the results of the validation tests conducted by the L2BP code Developers.



Appendix B. Beta-Testers Validation Test Log

This section will contain the results of the validation tests conducted by the L2BP Beta-Testers.