Aeolus Level 1b Processor and End-to-End Simulator

ESA Contract No. 16312/03//NL/MM

ASTRIUM Order AE.CO.ASU.GS.00026

L1bP Issue 7/14 Software Release Note

AED-SD-DoRIT-L1B-009

(former ADM-RN-52-3330)

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CHANGE RECORD

ISSUE	DATE	PAGE(S)	DESCRIPTION
1/0	Sept. 26, 2005	All	First Issue Reason for Changes: To support initial L1bP release 1.0.
1/1	Sept. 30, 2005	All	First Issue, First Revision Reason for Changes: To support L1bP release 1.0.1.
1/2	Dec. 9, 2005	All	First Issue, Second Revision Reason for Changes: To support L1bP release 1.0.2.
1/3	Jul. 05, 2006	All	First Issue, Third Revision Reason for Changes: To support L1bP related SPRs (ADM-MDA-0014 to ADM-MDA-0041).
1/4	Nov. 08, 2006	All	First Issue, Fourth Revision Reason for Changes: To support the changes according to CCN4 and the SPRs.
1/5	Jan. 17, 2007	All	First Issue, Fifth Revision Reason for Changes: To support L1bP release 1.05.
1/6	Apr. 12, 2007	All	First Issue, Sixth Revision Reason for Changes: To support L1bP release 1.06.
1/7	Jun. 12, 2007	All	First Issue, Seventh Revision Reason for Changes: To support L1bP release 1.07.

ISSUE	DATE	PAGE(S)	DESCRIPTION
1/8	Jan. 14, 2008	All	First Issue, Eighth Revision Reason for Changes: To support L1bP release 1.09.
1/9	Feb. 18, 2008	All	First Issue, Ninth Revision Reason for Changes: To support L1bP release 1.09.
1/10	Apr. 01, 2008	All	First Issue, Tenth Revision Reason for Changes: To support L1bP release 1.10.
1/11	Sept. 04, 2008	All	First Issue, Eleventh Revision Reason for Changes: To support L1bP release 1.11.
1/12	Oct. 30, 2008	All	First Issue, Twelfth Revision Reason for Changes: To support L1bP release 1.12.
5/03	Mar 23, 2009	All	First DLR Issue Support L1bP release 5.03
5/04	Jun. 19, 2009		Reason for Changes: To support L1bP release 5.04
5/05	Jan. 29, 2010		Reason for Changes: To support L1bP release 5.05 AE-IPF-24, AE-IPF-28, AE-IPF-40, AE-IPF-44, AE-IPF-52, AE-IPF-53, AE-IPF-54, AE-IPF-55, AE-IPF-56, AE-IPF-58, AE-IPF-59, AE-IPF-61, AE-IPF-62, AE-IPF-63, AE-IPF-65, AE-IPF-66, AE-IPF-67, AE-IPF-70, AE-IPF-73, AE-IPF-76, AE-IPF-77, AE-IPF-79

ISSUE	DATE	PAGE(S)	DESCRIPTION
5/06	Oct. 15, 2010	All	Reason for Changes: To support L1bP release 5.06 AE-IPF-80, AE-IPF-81, AE-IPF-82, AE-IPF-86. AE-IPF-90, AE-IPF-91, AE-IPF-92, AE-IPF-94 Processing of A2D data, update of DCO and ground detection algorithm, quality flagging of wind processing, and processing of NOP, UDM mode data
5/07	Dec. 20, 2010	All	Reason for Changes: To support L1bP release 5.07 AE-IPF-95, AE-IPF-96, AE-IPF-98, AE-IPF-100
6/00	Oct. 28, 2011		Sixth Issue Reason for Change: To support L1bP release 6.00; new system requirements; new make system; continuous mode operation; AE-IPF-103, AE-IPF-88
6/01	Jul. 01, 2012		Sixth Issue, First Revision Reason for Change: To support L1bP release 6/01;
6/02	Oct. 21, 2013		Sixth Issue, Second Revision Reason for Change: To support L1bP release 6/02
6/03	13-Jun-2014		Sixth Issue, Third Revision Reason for Change: To support L1bP release 6/03
6/03_CleanUp	08-Aug-2014		Sixth Issue, Third Revision, Clean up Reason for Change: To support L1bP release 6/03_CleanUp
6/04	26-Feb-2015		Sixth Issue, Fourth Revision Reason for Change: To support L1bP release 6/04
6/04_Patch_1	11-Mar-2015		Sixth Issue, Fourth Revision, Patch_1 Reason for Change: To support L1bP 6/04 Patch_1 release

ISSUE	DATE	PAGE(S)	DESCRIPTION
6/05	29-Jan-2016		Sixth Issue, Fifth Revision Reason for Change: To support L1bP 6/05 release
6/06	01-Jun-2016		Sixth Issue, Sixth Revision Reason for Change: To support L1bP 6/06 release
7/00	21-Jul-2017		Seventh Issue Reason for Change: To support L1bP 7/00 release
7/01			Seventh Issue, First Revision Reason for Change: To support L1bP 7/01 release
7/02	20-Jul-2018		Seventh Issue, Second Revision To support L1bP 7/02 release
7/02_DLR	25-Aug-2018		Seventh Issue, Second Revision, DLR Development Version To support L1bP 7/02_DLR
7/03	09-Sep-2018		Seventh Issue, Third Revision To support L1bP 7/03 release
7/04	17-Oct-2018		Seventh Issue, Fourth Revision To support L1bP 7/04 release
7/05	14-Dec-2018		Seventh Issue, Fifth Revision To support L1bP 7/05 release
7/06	30-Apr-2019		Seventh Issue, Sixth Revision To support L1bP 7/06 hot pixel patch release
7/07	08-Aug-2019		Seventh Issue, Seventh Revision To support L1bP 7/07 release
7/07_1	06-Oct-2019		Seventh Issue, Seventh Revision, First Sub-revision To support L1bP 7/07_1 release
7/08	10-Dec-2019		Seventh Issue, Eigth Revision To support L1bP 7/08 release

ISSUE	DATE	PAGE(S)	DESCRIPTION
7/08_1	07-Feb-2020		Seventh Issue, Eighth Revision, First Sub-revision
			To support L1bP 7/08_1 release
7/09	12-Jun-2020		Seventh Issue, Ninth Revision
			To support L1bP 7/09 release
7/09_1	19-Aug-2020		Seventh Issue, Ninth Revision, First Sub-revision
			To support L1bP 7/09_1 release
7/10	29-Jan-2021		Seventh Issue, Tenth Revision
			To support L1bP 7/10 release
7/10_1	17-Mar-2021		Seventh Issue, Tenth Revision, First Sub-revision
			To support L1bP 7/10_1 release
7/11_Pre	11-Jun-2021		Seventh Issue, Eleventh Revision
			To support L1bP 7/11 pre-release
7/11	30-Jul-2021		Seventh Issue, Eleventh Revision
			To support L1bP 7/11 release
7/11_1	06-Oct-2021		Seventh Issue, Eleventh Revision, First Sub-revision
			To support L1bP 7/11_1 release
7/11_2	22-Oct-2021		Seventh Issue, Eleventh Revision, Second Sub-revision
			To support L1bP 7/11_2 release
7/12	13-Dec-2021		Seventh Issue, Twelfth Revision
			To support L1bP 7/12 release
7/13	10-Jun-2022		Seventh Issue, Thirteenth Revision
			To support L1bP 7/13 release
7/13_1	03-Oct-2022		Seventh Issue, Thirteenth Revision, First Sub-revision
			To support L1bP 7/13_1 release
7/14	31-Jan-2023		Seventh Issue, Fourteenth Revision
			To support L1bP 7/14 release
			Note: SRN 7/14 dated Jan. 31, 2023 replaces SRN 7/14 dated Dec. 09, 2022. The latter is obsolete.

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations used in this document but not found in this list will be listed in the latest release of Document A-12.

E2S	ADM-Aeolus End-To-End Simulator
FAT	Factory Acceptance Test
L1bP	ADM-Aeolus Level 1B Processor
MDA	MacDonald Dettwiler

1 INTRODUCTION

1.1 Purpose of the Document

The purpose of this document is to provide information relevant to the release of the Aeolus Level 1B Processor (L1bP) software Issue 7/14, dated Jan 31, 2022.

This document is intended for individuals that will be installing and using this release of the Level 1B Processor software.

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2 DOCUMENTS

2.1 Applicable Documents

Applicable documents at the issue date or revision level shown provide information which either takes precedence over, or forms an intrinsic part of this document, to the extent specified herein.

A-1	AE.CO.ASU.GS.005	Level 1B processor and End to End Simulator Contract. Issue B.
A-2	AE-SW-ASU-GS-011	Statement of Work. Issue E2.
A-3	AE-RS-ASU-GS-022	Requirement Specification. Issue E2.
A-4	AE-SW-ASU-GS-023	Aeolus Master Algorithm Document. Issue 10
A-5	ESA-ID-ACS-GS-0001	PDS-IPF ICD Generic Interface Guidelines. Issue 2.2.
A-6	AE-RS-ASU-PA-001	Product Assurance Requirements for Subcontractors. Issue 3.
A-7	AE-RS-ASG-PA-002	Software Product Assurance Requirements. Issue 2A.
A-8	AE-SW-ASU-MA-001	Subcontractor Project Management. Issue H.
A-9	AE-RS-ASU-GS-023	Level 1B and End to End Simulator Document Contents Guidelines. Issue B.
A-10	ECSS-E-40B	Space Engineering Software – Part 1: Principles and Requirements. Draft, July 28, 2000.
A-11	ECSS-Q-80B	Space Product Assurance, Software Product Assurance. Issue B, October 10, 2004.
A-12	AE-LI-ASU-SY-001	Acronyms and Abbreviations. Issue 2.
A-13	AE-TN-ASU-SY-006	Background Document for Contractors. Issue B.

A-14	AE-ST-ASG-SY-001	Aeolus Packet Utilisation Standards. Issue 6, Dec. 17, 2004.
A-15	AE-IF-ASF-AL-00006	ALADIN Instrument FM TM/TC ICD. Issue 15,
A-16	AE-TN-ESA-SY-007	ADM-Aeolus Engineering Data Products Guidelines. Issue 1B.
A-17	PE-TN-ESA-GS-0001	Earth Explorer Ground Segment File Format Standard, Issue 1.4, June 13, 2003.
A-18	CS-NA-DMS-GS-001	Earth Explorer Mission Conventions Document. Issue 1.3, 15 July 2004.
A-19	AE-TN-ASF-AL-00044	ALADIN Instrument Operation Definition. Issue 3, 29 Oct. 2004.

2.2 Reference Documents

Reference documents provide background and/or supplementary information to the contents of this document. The reference documents are relevant to this document to the extent specified herein.

R-1	AED-SD-DoRIT-E2SL1B-011	Aeolus Level 1b Processor and End-to-End Simulator: Software Requirements Specification, Issue/Revision 1/09, May 15, 2020.
R-2	AED-SD-DoRIT-E2SL1B-015	Aeolus Verification Control Document, Issue 1/09, May 15, 2020.
R-3	AED-SD-DoRIT-E2SL1B-016	Aeolus Level 1b Processor and End-to-End Simulator Acceptance Test Plan, Issue 1/5, May 15, 2020.
R-4	AED-SD-DoRIT-L1B-014	Aeolus Level 1B Processor Acceptance Test Procedures, Issue 1/06, Jun. 12, 2020.
R-5	AED-SD-DoRIT-L1B-008	Aeolus Level 1B Processor Operator's Manual, Issue 2/12, Dec 09, 2022.
R-6	AED-SD-DoRIT-L1B-006	Input/Output Data Definitions Interface Control Document, Issue 4/18, Jan. 31, 2023.
R-7	AED-SD-DoRIT-L1B-007	Level 1b Processor Detailed Processing Model, Issue 3/18, Dec. 09, 2022
R-8	AE-TN-DLR-ACS-L1B	Additional Computational Steps ADM-Aeolus L1B, Issue 1.6, Jul. 25, 2014

R-9	AED-SD-DoRIT-E2S-002	ADM-Aeolus End-To-End Simulator Operator's Manual, 2/15, Nov 15, 2022
R-10	AED-TN-DoRIT-L1A-062	Investigation results dL1A_004: Beam propagation with refractive index using EO-CFI, V1.1, 12/11/2021

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3 VERSION DESCRIPTION

3.1 Overview

This release contains the Level 1B Processor Issue 7/14 software and updated documents. It consists of a source code package

- L1bP_Source_7.14,

four modified documents

- AED-SD-DoRIT-L1B-007, Level 1b Processor Detailed Processing Model, 521800_DPM_v3_18
- AED-SD-DoRIT-L1B-006, Input/Output Data Definitions Interface Control Document, 521666_IODD_v4_18
- AED-SD-DoRIT-L1B-008, L1B Software Users Manual, V 2/12 dated Dec 09, 2022
- AED-SD-DoRIT-L1B-009, L1bP Issue 7/14 Software Release Note

ten unmodified documents

- AED-SD-DoRIT-E2SL1BL2A-010, E2S & L1bP & L2aP-op Test Validation Plan, V1.3, dated Oct. 12, 2019
- AED-SD-DoRIT-L1B-012, Aeolus Level 1b Processor Architectural Design Document, V 3/6 dated June 12, 2020
- AED-SD-DoRIT-L1B-013, Aeolus Level 1b Processor External Interface Control Document, V 1/11 dated June 12, 2020
- AED-SD-DoRIT-L1B-014, Aeolus Level 1B Processor Acceptance Test Procedures,
- AED-SD-DoRIT-L1B-017, The E2S Satellite Characterisation and L1B AUX_CHAR input files, Issue 1.0 Rev 1,
- AED-SD-DoRIT-E2SL1B-015, Verification Control Document, Revision 1/09, dated May 15, 2020,
- AED-SD-DoRIT-E2SL1B-016, Acceptance Test Plan, Revision 1/05, dated May 15, 2020,
- AED-SD-DoRIT-E2SL1B-011, Software Requirements Specification, Revision 1/09, dated May 15, 2020,

1 modified special test document

- AED-SD-DoRIT-L1B-042, L1bP Runtime Performance Overview

Note: The auxiliary files provided with the source code package and installed into the `./aux` directory of the runtime are applicable to FMA data, E2S simulated data, and special test cases. Auxiliary files that shall be used for data processing of data measured from L1bP V7.14 delivery onward, are grouped in a dedicated directory Aux-Inputs, that is delivered in addition to L1bP V7.14 This directory usually holds three sub-directories:

- **fromPDGS:** For convenience this directory holds copies of the most recent auxiliary inputs from the ADDS. These are only files that have not changed their format or content with L1bP V7.14
- **newFormatAux:** This directory holds all auxiliaries that have either changed their format.
- **newContentAux:** This directory holds all auxiliaries that have changed their content but not their format.
- **forE2SSimulated:** This directory holds auxiliary files with special settings needed for E2S simulated data.

3.2 Updates

3.2.1 dL1B_037 Averaging and correction for DCO offset

A new parameter Do_Orbital_DCO_Pre_Processing has been added to the AUX_PAR_1B file.

- In case this flag is set to TRUE, and the Use_DCO_Correction_Lidar_Atmos == TRUE (so no implicit DCO correction requested,) a new mean orbital DCO correction value per height bin is calculated from all valid input measurements. In each height bin those DCO offset values are picked up, that are selected via the Use_Pixel_xx parameters. Also, for the valid reference pulses a new orbital mean is calculated.
- In case this flag is set to TRUE, and the Use_DCO_Correction_Lidar_Atmos == FALSE, so implicit DCO correction requested, the flag is ignored and no orbital mean is calculated.
- In case this flag is set to FALSE, the DCO handling depends solely on the settings for Use_DCO_Correction_Lidar_Atmos and Use_DCO_Correction_Mean_Mie_Reference_Pulse.

For imaging modes and the modes IAT and ISR the setting of this flag is ignored.

3.2.2 dL1B_035 Rayleigh SNR including DCO and read-out noise

The Rayleigh SNR calculation has been improved as described in dL1B_035. A switch named Use_DCO_Corr_And_RN_For_Ray_SNR has been added to the AUX_PAR_1B file in order to to turn this new method on (TRUE) or off (FALSE).

3.2.3 dL1B_DCMZ_007 QC based on the sun elevation angle

The AUX_PAR_1B has been updated: parameter Rayleigh_Solar_Background_Threshold has been removed; parameter Sun_Elevation_Threshold has been renamed to Sun_Elevation_Threshold_Background, and a new parameter Sun_Elevation_Threshold has been introduced.

In the DCMZ processing, the threshold check using Rayleigh_Solar_Background_Threshold has been removed and has been replaced by a check on the sun elevation, similar to the check that is already performed for the background measurements. For sun elevation checks of atmospheric and background measurements, two different settings are used.

The QC parameter section in the DCMZ_1B file has been updated: the parameter Num_Meas_Exceed_Solar_Bckg_Thres_Rayleigh has been deleted, Num_Meas_Exceed_Sun_Elevation_Threshold has been renamed to Num_Meas_Exceed_Sun_Elevation_Threshold_Background, and a new parameter Num_Meas_Exceed_Sun_Elevation for atmospheric measurements has been added.

3.2.4 dL1B_038 Selection of ACCD pixels that undergo DCMZ correction

A new section DCMZ_Correction_Slections has been added to the AUX_PAR_1B file. This section holds parameters that allow a selection of pixels that should be DCMZ corrected. This new settings are evaluated and deselected pixels (setting of 0) are not DCMZ corrected in the WVM/OWV, NRC, RRC and DCMZ processing.

3.2.5 dL1B_AUX_004 Update of AUX_CHAR file

New EMSR values have been provided for FM A; they have been copied to the AUX_CHAR file. Also, as further suggested in dL1B_AUX_004, the TOBS array entries have been flipped; values for pixels 1 and 16 switched, for 2 and 15 switched, etc.

3.2.6 Minor Updates

- A bug calculating the parameter Rayleigh_Average_Ground_Wind_Bin_Thickness has been identified and fixed.

- Start/Stop frequency range settings for the LBM processing are now checked that Start is lower than Stop. A new error message is displayed and LBM processing is stopped in case this check is not true.
- The frequency range for the LBM processing has to cover at least 1.2 GHz. In case the covered range is larger due to rounding or data representation errors in memory, the small deviation from a range of 1.2 GHz is tolerated without any message for the user.
- In case the frequency range is significantly larger than 1.2 GHz, the range was already cut of at Start-Range + 1.2GHz; but the informational message displayed has been updated. It informs the user now that the range is cut off but that processing still moves on.
- Initialization of local variables of type LID_Defs_ACCDRow and LID_Defs_ACCDData has been added to all *.cc files in the source directory aeolus/lobproc/LBC/src.
- The following XML schema files have been updated to validate the corresponding auxiliary files successfully:
    - Level_0_Processing_Parameters.xsd
    - Level_1A_Processing_Parameters.xsd
    - Level_1B_Processing_Parameters.xsd
    - Satellite_Characterisation.xsd
    - Auxiliary_Calibration_MRC.xsd
    - Auxiliary_Calibration_RRC.xsd
    - Auxiliary_Calibration_DCMZ.xsd
    - Auxiliary_Calibration_DCC.xsd
    - Auxiliary_Calibration_IAT.xsd
    - Auxiliary_Calibration_IDC.xsd
    - Auxiliary_Calibration_ISR.xsd
    - Auxiliary_Calibration_LBM.xsd
    - Auxiliary_Calibration_ZWC.xsd

3.3 New File Formats

Compared to L1bP V7.13.1 the following products generated or used by L1bP V7.14 have a new file format:

- AUX_PAR_1B
- AUX_DCMZ_1B

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4 COMPATIBILITY INFORMATION

4.1 Processor Compatibility Matrix

E2S	L1bP
V4.01	V7.02
V4.01	V7.03
V4.01	V7.04
V4.02	V7.05
V4.02	V7.06
V4.03	V7.06
V4.03	V7.07
V4.04	V7.08
V4.05	V7.09
V4.05	V7.09.1
V4.05	V7.10
V4.06	V7.10
V4.06	V7.10.1
V4.06	V7.11
V4.07	V7.11

V4.07	V7.11.1
V4.07	V7.11.2
V4.07	V7.12
V4.08	V7.12
V4.08	V7.13
V4.08	V7.13.1
V4.09	V7.14

Table 4-1 L1bP Processor Compatibility Matrix

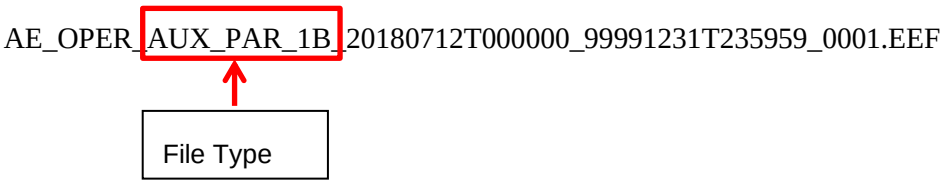
4.2 Auxiliary Files Compatibility Matrices

Note: The L1bP V7.14 is delivered with a set of updated auxiliary input files suited for processing FMA data. Input files for FMB data are provided in a separate directory.

The tables below list all static auxiliary input files used by the L1b operational processor, where

- **File Type** denotes the specific sub-string of the product name that identifies the product,
- **Origin** specifies the company providing the file,
- **Schema Version** defines the version as specified in the header of the file, and
- **Ref Doc** specifies the IODD that defines the product.
- **s/d** indicates if file is used as static or dynamic input.

Example:



4.2.1 Auxiliary Input Files

The File Version has not been filled, as it is not clear to the contractor, how to fill the column. This needs to be discussed with DOS and ESA/ESRIN.

File Type	Origin	Schema Version	Ref Doc	s/d
AUX_CHAR	DoRIT	04.16	SD-DoRIT-L1B-006 v4.16	s
AUX_PAR_0	DoRIT	04.09	521666_IODD_4_09	s
AUX_PAR_1A	DoRIT	04.13	SD-DoRIT-L1B-006 v4.13	s
AUX_PAR_1B	DoRIT	04.18	SD-DoRIT-L1B-006 v4.18	s
MPL_ORBSCT	ESA	1.5	Not known	s
AUX_HBE	DoRIT	04.09	521666_IODD_4_09	s
AUX_RDB	DoRIT	04.09	521666_IODD_4_09	s
AUX_DCMZ	EDAFECS	04.18	SD-DoRIT-L1B-006 v4.18	d
AUX_MRC	EDAFECS	04.16	SD-DoRIT-L1B-006 v4.16	s
AUX_RRC	EDAFECS	04.14	SD-DoRIT-L1B-006 v4.14	s
AUX_ZWC	PDGS	04.09	521666_IODD_4_09	s

Table 4-2 Auxiliary Files Compatibility Matrix

5 ENVIRONMENT NEEDED

This release of the Level 1B Processor software is intended for the following environment:

RedHat Linux Enterprise Server, Kernel 2.6.32-71.el6.x86-64 for 64bit

GNU Compiler Collection (GCC) 4.4.4

GNU Fortran (GCC) 4.4.4

libxml2 2.5.10

Matlab 7.0.4 for Linux, Service Pack 1 or higher

IBM Java Software Development Kit V1.6.0

Perl V5.10.1

cmake 2.8

Digital Elevation Model (DEM) data and flag files (compatible with the Earth Explorer CFI) need to be installed together in a dedicated directory.

pdflatex (necessary only for the test script)

perl packages Time::Piece, Time::Seconds, Getopt::Long, File::Copy, File::Spec, File::Path, Cwd (necessary only for the test script)

perl packages Date::Manip and Switch (only for performance script detJobDuration.pl)

5.1 Installation Instructions

Please refer to the Level 1B Processor Operator's Manual, Document R-5, for instruction on how to compile and install the software.

5.2 Tested Platforms

5.2.1 Platform 1 – yuma

#		
1	Hardware Configuration	DELL Latitude 5590 BTX Intel Core i5-8250U, 4 kernels, 1.6GHz 6 MB Cache
2	Linux Distribution	Ubuntu “bionic” 18.04.3 LTS gcc version Matlab R2019a Java Software Development Kit V1.0.4 Perl V5.26.1 cmake 3.10.2 libxml2 2.9.4

5.2.2 Platform 2 – adm1

#		
1	Hardware Configuration	PowerEdge M640 Blade Server 46 Intel(R) Xeon(R) Gold 6152 CPU @ 2.10GHz 128 GB RAM
2	Linux Distribution	openSUSE Leap 15.0, 4.12.14-lp150.12.45-default x86_64 gcc version 7.4.0 Matlab R2019a Java Software Development Kit V1.6.0 Perl V5.26.1 cmake 3.10.2 libxml2 2.5.10

5.2.3 Platform 3 – adm5

#		
1	Hardware Configuration	DELL PowerEdge R410 8 Intel(R) Xeon(R) CPU E5620 @ 2.40GHz 8 GB RAM
2	Linux Distribution	RedHat Linux Enterprise Server, Kernel 2.6.32-71.el6.x86-64 gcc version 4.4.4 20100726 (Red Hat 4.4.4-13) Matlab 7.0.4 Java Software Development Kit V1.6.0 Perl V5.10.1 cmake 2.8 libxml2 2.5.10

5.2.4 Platform 4 – adm2

Due to a hardware problem on adm2 (broken hard disc drive) L1bP V7.14 could not be tested on this machine.

#		
1	Hardware Configuration	DELL PE 1950 4 Intel(R) Xeon(R) CPU 5160 @ 3.00GHz 8 GB RAM
2	Linux Distribution	openSUSE 12.3 (Dartmouth) (x86_64) gcc (SUSE Linux) 4.7.2 20130108 [gcc-4_7-branch revision 195012] MATLAB Version 7.13.0.564 (R2011b) java-1.6.0-openjdk-1.6.0.0.x86_64 perl 5, version 16, subversion 2 (v5.16.2) built for x86_64-linux-thread-multi cmake version 2.8.10.2 libxml2-2-2.9.0-2.29.1.x86_64

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