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Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for OMPS Limb RDR

NOAA / NASA

Goddard Space Flight Center Greenbelt, Maryland

Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirement Specification (SRS) for OMPS Limb RDR

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Preface

This document is under JPSS Ground Segment (GS) configuration control. Once this document is approved, JPSS approved changes are handled in accordance with Class I and Class II change control requirements as described in the JPSS Configuration Management Procedures, and changes to this document shall be made by complete revision.

Any questions should be addressed to:

JPSS Configuration Management Office
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Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev-	August 22, 2013	This version incorporates 474-CCR-13-1177 which was approved by JPSS Ground ERB on the effective date shown.
A	Jan 23, 2014	This version incorporates 474-CCR-13-1459 which was approved by JPSS Ground ERB on the effective date shown.
A1	Oct 23, 2014	This version incorporates 474-CCR-14-2091 which was approved by the JPSS Ground ERB for CO10 on the effective date shown.
B	Oct 23, 2014	This version incorporates 474-CCR-14-1721, 474-CCR-14-1741, 474-CCR-14-1781, 474-CCR-14-1793, 474-CCR-14-2072 and 474-CCR-14-2110 which was approved by JPSS Ground ERB on the effective date shown.
0200C	Sep 22, 2016	This version incorporates 474-CCR-15-2452, 474-CCR-15-2480, 474-CCR-15-2657, 474-CCR-16-2939 and 474-CCR-16-3049 which was approved by JPSS Ground ERB on the effective date shown.
0200D	Feb 09, 2018	This version incorporates 474-CCR-18-3822 which was approved by JPSS Ground ERB on the effective date shown.
E	Dec 14, 2018	This version incorporates 474-CCR-18-4203. This version incorporates 0220B of 474-00448-01-28-B0220, dated 07/14/2018 to create this baseline. This was approved by the JPSS Ground ERB on the effective date shown.
F	Apr 30, 2020	This version incorporates 474-CCR-19-4697 which was approved by the JPSS Ground ERB on Nov 26, 2019 and by the JPSS Ground Segment CCB on Dec 05, 2019, 474-CCR-4719 approved by JPSS Ground ERB on Mar 11, 2020 and by the JPSS Ground Segment CCB on Mar 26, 2020, 474-CCR-20-4973 approved by the JPSS Ground ERB on Apr 21, 2020 and by the JPSS Ground Segment CCB on the effective date shown.
G	Jul 30, 2020	This version incorporates 474-CCR-20-5127 approved by the JPSS Ground ERB on July 24, 2020 and by the JPSS Ground Segment CCB on the effective date shown.
H	Aug 26, 2021	This version incorporates 474-CCR-21-5445 which was approved by the JPSS Ground ERB on May 07, 2021 and by the JPSS Ground Segment CCB on the effective date shown.

Table of Contents

1 INTRODUCTION 1
1.1 Identification 1
1.2 Algorithm Overview 1
1.3 Document Overview 1
2 RELATED DOCUMENTATION 2
2.1 Parent Documents 2
2.2 Applicable Documents 2
3 ALGORITHM REQUIREMENTS 3
3.1 States and Modes 3
3.1.1 Normal Mode Performance 3
3.1.2 Graceful Degradation Mode Performance 3
3.2 Algorithm Functional Requirements 3
3.2.1 Product Production Requirements 3
3.2.2 Algorithm Science Requirements 3
3.2.3 Algorithm Exception Handling 3
3.3 External Interfaces 3
3.3.1 Inputs 3
3.3.2 Outputs 3
3.4 Science Standards 5
3.5 Metadata Output 5
3.6 Quality Flag Content Requirements 5
3.7 Data Quality Notification Requirements 5
3.8 Adaptation 5
3.9 Provenance Requirements 5
3.10 Computer Software Requirements 5
3.11 Software Quality Characteristics 5
3.12 Design and Implementation Constraints 5
3.13 Personnel Related Requirements 5
3.14 Training Requirements 5
3.15 Logistics Related requirements 5
3.16 Other Requirements 5
3.17 Packaging Requirements 5
3.18 Precedence and Criticality 6
APPENDIX A. REQUIREMENTS ATTRIBUTES 7

1 INTRODUCTION

The Joint Polar Satellite System (JPSS) is the National Oceanic and Atmospheric Administration's (NOAA) next-generation operational Earth observation program that acquires and distributes global environmental data primarily from multiple polar-orbiting satellites. The program plays a critical role in NOAA's mission to understand and predict changes in weather, climate, oceans and coasts, and the space environment, which support the Nation's economy and protect lives and property. For information regarding the JPSS Program, missions, instruments, and partners, see the JPSS website at https://www.jpss.noaa.gov/.

1.1 Identification

This volume documents the software used in the generation of Raw Data Record (RDR) algorithms for the Ozone Mapping and Profiler Suite Limb Sounder (OMPS Limb). It documents the OMPS Limb RDRs.

1.2 Algorithm Overview

The Ozone Mapping and Profiler Suite (OMPS) collects data to permit the calculation of the vertical and horizontal distribution of ozone in the Earth's atmosphere. OMPS consists of separate nadir and limb sensors. The OMPS Nadir module consists of the Nadir Mapper and the Nadir Profiler sensors. When an OMPS Limb instrument is present, the OMPS measurements can be used to make (limb) ozone profile EDRs with high vertical resolution throughout the stratosphere. OMPS Limb instrument will not be flown on the JPSS-1 satellite but will be flown on the JPSS-2 satellite if provided by NASA. The JPSS ground processing software produces RDRs for OMPS Limb instrument (a.k.a. OMPS-L or OMPS LP RDRs) from the application packets received.

1.3 Document Overview

Section	Description
Section 1	Introduction - Provides a brief overview of the JPSS Ground System and the relevant algorithm, as reference material only.
Section 2	Related Documentation - Lists related documents and identifies them as Parent, Applicable, or Information Documents such as, MOAs, MOUs, technical implementation agreements, as well as Data Format specifications. This section also establishes an order of precedence in the event of conflict between two or more documents.
Section 3	Algorithm Requirements - Provides a summary of the science requirements for the products covered by this volume.
Appendix A	Requirements Attributes - Provides the mapping of requirements to verification methodology and attributes.

2 RELATED DOCUMENTATION

The latest JPSS documents can be obtained from URL: https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm. JPSS Project documents have a document number starting with 470, 472 or 474 indicating the governing Configuration Control Board (CCB) (Program, Flight, or Ground) that has the control authority of the document.

2.1 Parent Documents

The following reference documents are the Parent Documents from which this document has been derived. Any modification to a Parent Document will be reviewed to identify the impact upon this document. In the event of a conflict between a Parent Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
474-01541	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
474-01543	Joint Polar Satellite System (JPSS) Ground Segment Data Product Specification (GSegDPS)
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification for the Common Algorithms

2.2 Applicable Documents

The following documents are the Applicable Documents from which this document has been derived. Any modification to an Applicable Document will be reviewed to identify the impact upon this document. In the event of conflict between an Applicable Document and the content of this document, the JPSS Program Configuration Change Board has the final authority for conflict resolution.

Doc. No.	Document Title
474-00448-04-28	Joint Polar Satellite System (JPSS) Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for the OMPS Limb RDR
474-00448-04-08	JPSS Algorithm Specification Volume IV: Software Requirements Specification Parameter File (SRSPF) for the Geolocation and Spacecraft Orientation

3 ALGORITHM REQUIREMENTS

3.1 States and Modes

3.1.1 Normal Mode Performance

Not applicable.

3.1.2 Graceful Degradation Mode Performance

Not applicable.

3.2 Algorithm Functional Requirements

3.2.1 Product Production Requirements

Not applicable.

3.2.2 Algorithm Science Requirements

Not applicable.

3.2.3 Algorithm Exception Handling

Not applicable.

3.3 External Interfaces

3.3.1 Inputs

Not applicable

3.3.2 Outputs

SRS.01.28_144 The OMPS Limb Profile RDR software shall generate the OMPS Limb Profile Science RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Limb RDR (474-00448-04-28) <RDR><Science>.

Rationale: The Science RDR is one of OMPS LP RDR products and is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.28_145 The OMPS Limb Profile RDR software shall generate the OMPS Limb Profile Diagnostic Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Limb RDR (474-00448-04-28) <RDR><DiagCal>.

Rationale: The Diagnostic Calibration RDR is one of OMPS LP RDR products and is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.28_146 The OMPS Limb Profile RDR software shall generate the OMPS Limb Profile Diagnostic Exposure #1 Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Limb RDR (474-00448-04-28) <RDR><DiagExposEV_1>.

Rationale: The Diagnostic Exposure #1 Earth View RDR is one of OMPS LP RDR products and is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.28_147 The OMPS Limb Profile RDR software shall generate the OMPS Limb Profile Diagnostic Exposure #2 Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Limb RDR (474-00448-04-28) <RDR><DiagExposEV_2>.

Rationale: The Diagnostic Exposure #2 Earth View RDR is one of OMPS LP RDR products and is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

SRS.01.28_148 The OMPS Limb Profile RDR software shall generate the OMPS Limb Profile Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Limb RDR (474-00448-04-28) <RDR><Cal>.

Rationale: The Calibration RDR is one of OMPS LP RDR products and is generated from the specified mission data packet APIDs. APIDs associated with the Spacecraft Diary, as defined in the JPSS Algorithm Specification Vol IV: SRS Parameter File for Geolocation and Spacecraft Orientation (474-00448-04-08), are included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-2

Block Start: 2.0.0 *Block End:* 3.0.0

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

Not applicable.

3.7 Data Quality Notification Requirements

Not applicable.

3.8 Adaptation

Not applicable.

3.9 Provenance Requirements

Not applicable.

3.10 Computer Software Requirements

Not applicable.

3.11 Software Quality Characteristics

Not applicable.

3.12 Design and Implementation Constraints

Not applicable.

3.13 Personnel Related Requirements

Not applicable.

3.14 Training Requirements

Not applicable.

3.15 Logistics Related requirements

Not applicable.

3.16 Other Requirements

Not applicable.

3.17 Packaging Requirements

Not applicable.

3.18 Precedence and Criticality

Not applicable.

Appendix A. Requirements Attributes

The Requirements Attributes can be found in the VCRMs at Ground > Mission System Engineering > Ground SEIT Unrestricted > VCRM

https://jpss.gsfc.nasa.gov/sites/ground/MSE/9/Forms/AllItems.aspx?RootFolder=%2Fsites%2Fground%2FMSE%2F9%2FVCRM&FolderCTID=0x012000D0555EA1A211E64A9A7DE7CBCE72DE8B&View=%7B4267AEFE%2D7E8B%2D402D%2D919D%2D41BED55BA4E7%7D