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**Joint Polar Satellite System (JPSS)
Algorithm Specification Volume I:
Software Requirement Specification (SRS)
for the OMPS TC RDR/SDR**

Block 2.0.0



National Aeronautics and
Space Administration

**Goddard Space Flight Center
Greenbelt, Maryland**

**Joint Polar Satellite System (JPSS) Algorithm Specification
Volume I:
Software Requirement Specification (SRS) for the OMPS
TC RDR/SDR
JPSS Review/Approval Page**

Prepared By:

JPSS Ground System
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)

Approved By:

Robert M. Morgenstern Date
JPSS Ground Project Mission Systems Engineering Manager
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)

Approved By:

Daniel S. DeVito Date
JPSS Ground Project Manager
(Electronic Approvals available online at https://jpssmis.gsfc.nasa.gov/frontmenu_dsp.cfm)

**Goddard Space Flight Center
Greenbelt, Maryland**

Preface

This document is under JPSS Ground Project 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
NASA/GSFC
Code 474
Greenbelt, MD 20771

Change History Log

Revision	Effective Date	Description of Changes (Reference the CCR & CCB/ERB Approve Date)
Rev -	August 8, 2013	This version incorporates 474-CCR-13-1117 which was approved by the JPSS Ground ERB on the effective day shown.
A	Jan 23, 2014	This version incorporates 474-CCR-14-1355 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-14-1793, 474-CCR-14-1781 and 474-CCR-14-2074 which was approved by JPSS Ground ERB on the effective date shown.
0200C	Sep 22, 2016	This version incorporates 474-CCR-14-2110, 474-CCR-15-2452 and 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	Jan 11, 2017	This version incorporates 474-CCR-16-3179 which was approved by JPSS Ground ERB on the effective date shown.

Table of TBDs/TBRs

TBx	Type	ID	Text	Action
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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. The first JPSS satellite mission, the Suomi National Polar-orbiting Partnership (S-NPP) satellite, successfully launched in October 2011. S-NPP, along with the legacy NOAA Polar Operational Environmental Satellites (POES), provides continuous environmental observations. Two JPSS satellites will follow S-NPP: JPSS-1, planned for launch in fiscal year (FY) 2017, with JPSS-2 to follow in FY2021. In the future, the JPSS Polar Follow-On (PFO) provides for two additional missions, JPSS-3 and JPSS-4, as follow-on to the JPSS-2 mission to extend the JPSS Program lifecycle out to 2038.

In addition to the JPSS Program's own satellites operating in the 1330 (± 10) Local Time of the Ascending Node (LTAN) orbit, NOAA also leverages mission partner assets for complete global coverage. These partner assets include the Department of Defense (DoD) Defense Meteorological Satellite Program (DMSP) operational weather satellites (in the 1730 - 1930 LTAN orbit), the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Meteorological Operational (Metop) satellites (in the 2130 LTAN orbit) and the Japanese Aerospace Exploration Agency (JAXA) Global Change Observation Mission-Water (GCOM-W) satellite (in the 1330 LTAN orbit). JPSS routes Metop data from McMurdo Station, Antarctica to the EUMETSAT facility in Darmstadt, Germany and EUMETSAT, in turn, provides Metop data to NOAA. For GCOM, JPSS routes the GCOM-W data from Svalbard, Norway to the NOAA Satellite Operations Facility (NSOF) in Suitland, MD, processes GCOM-W data and delivers GCOM-W products to the JPSS users who have JAXA permissions.

Additionally, the JPSS Program provides data acquisition and routing support to the DMSP and the WindSat Coriolis Program. JPSS routes DMSP data from McMurdo Station to the 557th Weather Wing at Offutt Air Force Base in Omaha, NE. After processing, the 557th releases the DMSP data for public consumption over the Internet via the National Centers for Environment Information (NCEI) in Boulder, CO. The JPSS Program provides data routing support to the National Science Foundation (NSF), as well as the National Aeronautics and Space Administration (NASA) Space Communications and Navigation (SCaN)-supported missions, which include the Earth Observing System (EOS). As part of the agreements for the use of McMurdo Station, JPSS provides communications/network services for the NSF between McMurdo Station, Antarctica and Centennial, Colorado.

As a multi-mission ground infrastructure, the JPSS Ground System supports the heterogeneous constellation of the before-mentioned polar-orbiting satellites both within and outside the JPSS Program through a comprehensive set of services as listed in Table 1-1.

Table: 1-1 JPSS Ground System Services

Service	Description
Enterprise Management and Ground Operations	Provides mission management, mission operations, ground operations, contingency management and system sustainment
Flight Operations	Provides launch support and early orbit operations, telemetry and commanding, orbital operations, mission data playback, payload support, flight software upgrade, flight vehicle simulation, and disposal at the end of mission life
Data Acquisition	Provides space/ground communications for acquiring mission data
Data Routing	Provides routing of telemetry, mission and/or operations data through JPSS' global data network
Data Product Generation	Provides the processing of mission data to generate and distribute raw, sensor, environmental, and ancillary data products
Data Product Calibration and Validation	Provides calibration and validation of the data products
Field Terminal Support	Provides development and operational support to the Field Terminal customers

1.1 Identification

This SRS provides requirements for OMPS (Ozone Mapping and Profiler Suite) Nadir Total Column (NTC) Raw Data Records (RDRs) and Sensor Data Records (SDRs). OMPS measures stratospheric ozone through the measurement of backscattered ultraviolet (UV) radiances. OMPS Nadir (OMPS-N) system consists of two instruments, a Nadir Total Column Mapper (NM) and a Nadir Profiler (NP). The nadir total column sensor has a focal plane UV grating spectrometer that provides measurements between 300 to 420 nm (300 to 380 nm for S-NPP), with a spectral resolution of 0.45 nm. The total cross-track field of view is 110 degrees.

1.2 Algorithm Overview

The Nadir Total Column (NTC or TC) ozone SDR is generated from the RDR for the total column focal plane of the OMPS instrument. The SDR processing produces an earth-scene SDR from the backscatter of solar radiation. The nadir total column earth scene SDR provides raw counts, count corrections, and calibrated earth and sun radiances for subsequent EDR processing into a measurement of total column ozone. The OMPS system will produce two JPSS EDRs, Ozone Total Column (TC) and Ozone Nadir Profile (NP).

The OMPS algorithms include the following:

1. The Nadir Total Column Ozone SDR algorithm
2. The Nadir Profile Ozone SDR algorithm
3. The Nadir Total Column Ozone Algorithm
4. The Nadir Profile Ozone Algorithm

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	Description
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 document(s) is (are) the Parent Document(s) 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
470-00067	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD)
470-00067-02	Joint Polar Satellite System (JPSS) Ground System Requirements Document (GSRD), Vol. 2 - Science Product Specification
474-00448-01-01	Joint Polar Satellite System (JPSS) Algorithm Specification Volume I: Software Requirements Specification (SRS) for the Common Algorithms

2.2 Applicable Documents

The following document(s) is (are) the Applicable Document(s) 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
474-00029	Joint Polar Satellite System (JPSS) OMPS NADIR Total Column Ozone Algorithm Theoretical Basis Document (ATBD)
474-00448-02-04	Joint Polar Satellite System (JPSS) Algorithm Specification Vol II: Data Dictionary for OMPS Total Column RDR/SDR
474-00448-04-04	Joint Polar Satellite System (JPSS) Algorithm Specification Vol IV: Software Requirements Specification Parameter File (SRSPF) for OMPS Total Column RDR/SDR

2.3 Information Documents

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of this document.

Doc. No.	Document Title
474-00333	Joint Polar Satellite System (JPSS) Ground System (GS) Architecture Description Document (ADD)
474-00054	Joint Polar Satellite System (JPSS) Ground System (GS) Concept of Operations (ConOps)
470-00041	Joint Polar Satellite System (JPSS) Program Lexicon

Doc. No.	Document Title
474-00448-03-04	Joint Polar Satellite System (JPSS) Algorithm Specification Volume III: Operational Algorithm Description (OAD) for the OMPS Total Column RDR/SDR
429-05-02-42	Joint Polar Satellite System (JPSS) Mission Data Format Control Book National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project (NPP) (MDFCB)
472-00251	Joint Polar Satellite System (JPSS) Mission Data Format Control Book for JPSS-1
472-00331	Joint Polar Satellite System-1 (JPSS-1) Ozone Mapping and Profiler Suite (OMPS) Mission Data Packet Structures

3 Algorithm Requirements

3.1 States and Modes

3.1.1 Normal Mode Performance

SRS.01.04_487 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with an albedo calibration accuracy of 2%.

Rationale: The accuracy values of the earth view radiance with an albedo calibration were flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_488 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with spectral pixel-to-pixel calibration accuracy of 0.5%.

Rationale: The accuracy values of the pixel-to-pixel calibration were flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.04_489 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance holding the out-of-band stray light to less than 1% at all wavelengths.

Rationale: The limiting values of the out-of-band stray light were flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.04_658 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance over the wavelength range of 302 to 382 nm.

Rationale: The wavelength range of the earth view radiance was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: S-NPP

SRS.01.04_490 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance over the wavelength range of 300 to 420 nm.

Rationale: The wavelength range of the earth view radiance was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.04_659 The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with a horizontal cell size of 50 km at nadir.

Rationale: The horizontal cell size of the earth view radiance was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: S-NPP

SRS.01.04_491 The OMPS Nadir Total Column algorithm shall calculate and/or aggregate the earth view radiance with a horizontal cell size of 50 km or less at nadir.

Rationale: The horizontal cell size of the earth view radiance was flowed down from the Level 1 and Level 2 documents.

Mission Effectivity: JPSS-1, JPSS-2

SRS.01.04_661 The OMPS Nadir Total Column SDR Geolocation algorithm computation shall have a one-sigma mapping uncertainty of 5 km.

Rationale: The requirement is derived from L1RD requirements for Ozone NTC EDR.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

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

SRS.01.04_492 The OMPS Nadir Total Column SDR software shall incorporate a computing algorithm provided for earth-view radiances.

Rationale: The Nadir TC earth-view radiance data is one of OMPS TC SDR products. The SDR software through its computing algorithm must produce the Total Column earth view radiance data. The OMPS NADIR Total Column Ozone ATBD (474-00029) provides details on the algorithm science.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.2.3 Algorithm Exception Handling

SRS.01.04_107 The OMPS Nadir Total Column SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Science_SDR><fill>.

Rationale: The SDR software through its computing algorithm must fill the OMPS Nadir TC SDR values based on the established fill conditions to satisfy exclusion and fill conditions.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.3 External Interfaces

3.3.1 Inputs

SRS.01.04_100 The OMPS Nadir Total Column SDR software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended OMPS TC SDR products.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_119 The OMPS Nadir Total Column SDR Geolocation software shall incorporate inputs specified in Table 3-1.

Rationale: The SDR generation software must be able to receive and process the resource interaction items shown in Table 3-1 in order to produce the intended OMPS TC SDR geolocation products.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_662 The OMPS Nadir Total Column SDR software shall ingest input tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS NP RDR/SDR (474-00448-02-04).

Rationale: This defines the formats for Lookup Tables, and Processing Coefficients for input into the algorithm module.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

Table 3-1 and Figure 3-1 are best viewed together since they describe the processes governed by this SRS in different ways. The figure diagrams the data flowing into, out of, and within the code governed by this SRS. The table lists these same data interactions as well as all downstream dependencies for outputs from this SRS.

Each row in the table describes a single software interaction - data flowing from one software item to another. The data is listed in the first column. The second column includes the mnemonic or short name for the data. Blanks indicate there is no mnemonic. The third and fourth columns contain the SRS that generates the data product(s) in the first column, and the SRS that receives those products. The final two columns contain the actual function name in Algorithm Development Library (ADL) that produces those products, and the function that inputs those products. The SRS's titled "Ingest MSD" and "Store/Retrieve" are non-existent SRS's functioning as data handling for the IDPS. The software functions "Store Products" and "Retrieve Products" are similar non-existent functions that operate as IDPS data handling.

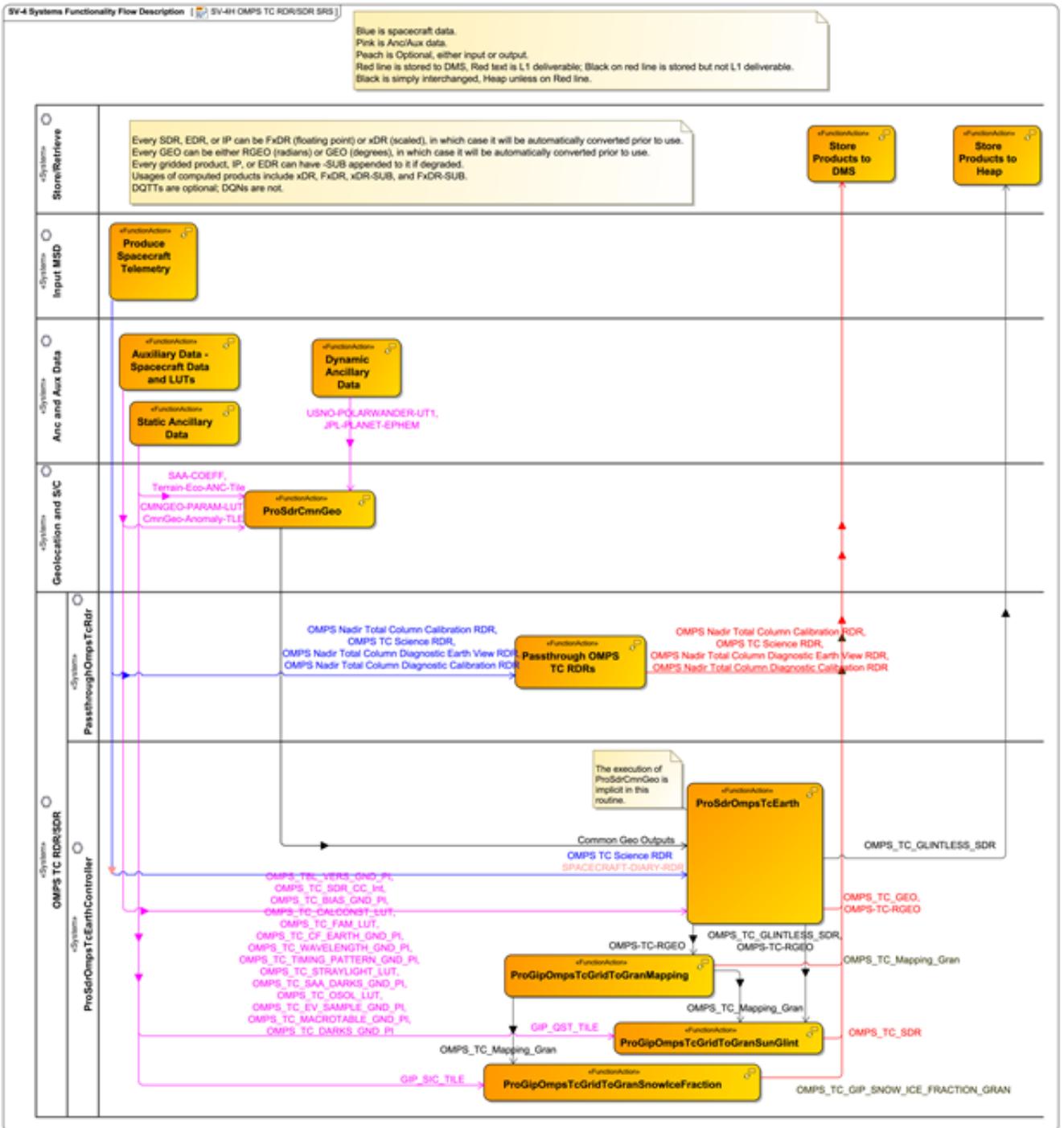


Figure: 3-1 OMPS TC RDR/SDR Data Flows

Table: 3-1 SV-6 Systems Resource Flow Matrix: OMPS TC RDR/SDR

	Data Product Name	Collection Short Name	Mnemonic	Sending Function	Receiving Function	Sending SRS	Receiving SRS
1	<ul style="list-style-type: none"> •OMPS Nadir Total Column Calibration RDR •OMPS TC Science RDR •OMPS Nadir Total Column Diagnostic Earth View RDR •OMPS Nadir Total Column Diagnostic Calibration RDR 	<ul style="list-style-type: none"> •OMPS-TCCALIBRATION-RDR •OMPS-TCSCIENCE-RDR •OMPS-TCDIAGNOSTIC-RDR •OMPS-TCDIAGCAL-RDR 	<ul style="list-style-type: none"> •RDRE-OMPS-C0051 •RDRE-OMPS-C0031 •RDRE-OMPS-C0050 •RDRE-OMPS-C0038 	Produce Spacecraft Telemetry	Passthrough OMPS TC RDRs	Input MSD	OMPS TC RDR/SDR
2	<ul style="list-style-type: none"> •OMPS TC Science RDR 	<ul style="list-style-type: none"> •OMPS-TCSCIENCE-RDR 	<ul style="list-style-type: none"> •RDRE-OMPS-C0031 	Produce Spacecraft Telemetry	ProSdrOmpsTc Earth	Input MSD	OMPS TC RDR/SDR
3	<ul style="list-style-type: none"> •SPACECRAFT-DIARY-RDR 	<ul style="list-style-type: none"> •SPACECRAFT-DIARY-RDR 	<ul style="list-style-type: none"> •RDRE-SCAE-C0030 	Produce Spacecraft Telemetry	ProSdrOmpsTc Earth	Input MSD	OMPS TC RDR/SDR
4	<ul style="list-style-type: none"> •OMPS_TBL_VERS_GND_PI •OMPS_TC_SDR_CC_Intent •OMPS_TC_BIAS_GND_PI •OMPS_TC_CALCONST_LUT •OMPS_TC_FAM_LUT •OMPS_TC_CF_EARTH_GND_PI •OMPS_TC_WAVELENGTH_GND_PI •OMPS_TC_TIMING_PATTERN_GND_PI •OMPS_TC_STRAYLIGHT_LUT •OMPS_TC_SAA_DARKS_GND_PI 	<ul style="list-style-type: none"> •OMPS-TBL-VERS-GND-PI •OMPS-TC-SDR-CC-PI •OMPS-TC-BIAS-GND-PI •OMPS-TC-CALCONST-LUT •OMPS-TC-FAM-LUT •OMPS-TC-CF-EARTH-GND-PI •OMPS-TC-WAVELENGTH-GND-PI •OMPS-TC-TIMING-PATTERN-GND-PI •OMPS-TC-STRAYLIGHT-LUT 	<ul style="list-style-type: none"> •NP_NU-LM0240-130 •DP_NU-LM2020-005 •NP_NU-LM0240-133 •NP_NU-LM0240-008 •NP_NU-LM0240-009 •NP_NU-LM0240-027 •NP_NU-LM0240-026 •NP_NU-LM0240-020 •NP_NU-LM0240-129 	Auxiliary Data - Spacecraft Data and LUTs	ProSdrOmpsTc Earth	Anc and Aux Data	OMPS TC RDR/SDR

	Data Product Name	Collection Short Name	Mnemonic	Sending Function	Receiving Function	Sending SRS	Receiving SRS
	<ul style="list-style-type: none"> •OMPS_TC_OSOL_LUT •OMPS_TC_EV_SAMPLE_GND_PI •OMPS_TC_MACROTABLE_GND_PI •OMPS_TC_DARKS_GND_PI 	<ul style="list-style-type: none"> •OMPS-TC-SAA-DARKS-GND-PI •OMPS-TC-OSOL-LUT •OMPS-TC-EV-SAMPLE-GND-PI •OMPS-TC-MACROTABLE-GND-PI •OMPS-TC-DARKS-GND-PI 	<ul style="list-style-type: none"> •NP_NU-LM0240-132 •NP_NU-LM0240-010 •NP_NU-LM0240-022 •NP_NU-LM0240-023 •NP_NU-LM0240-131 				
5	•GIP_SIC_TILE	•GridIP-VIIRS-Snow-Ice-Cover-Rolling-Tile	•IMPI_VGSC_R0100	Static Ancillary Data	ProGipOmpsTcGridToGranSnowIceFraction	Anc and Aux Data	OMPS TC RDR/SDR
6	•GIP_QST_TILE	•GridIP-VIIRS-Qst-Quarterly-Tile	•IMPI_QSIP_R0010	Static Ancillary Data	ProGipOmpsTcGridToGranSunGlint	Anc and Aux Data	OMPS TC RDR/SDR
7	•Common Geo Outputs	•None	•None	ProSdrCmnGeo	ProSdrOmpsTcEarth	Geolocation and S/C	OMPS TC RDR/SDR
8	•OMPS-TC-RGEO	•OMPS-TC-GEO	•None	ProSdrOmpsTcEarth	ProGipOmpsTcGridToGranMapping	OMPS TC RDR/SDR	OMPS TC RDR/SDR
9	<ul style="list-style-type: none"> •OMPS_TC_GLINTLESS_SDR •OMPS-TC-RGEO 	<ul style="list-style-type: none"> •OMPS-TC-Glintless-SDR •OMPS-TC-GEO 	<ul style="list-style-type: none"> •None •None 	ProSdrOmpsTcEarth	ProGipOmpsTcGridToGranSunGlint	OMPS TC RDR/SDR	OMPS TC RDR/SDR
10	•OMPS_TC_Mapping_Gran	•OMPS-TC-Grid-To-Gran-GridIP-Mapping-IP	•None	ProGipOmpsTcGridToGranMapping	ProGipOmpsTcGridToGranSunGlint	OMPS TC RDR/SDR	OMPS TC RDR/SDR
11	•OMPS_TC_Mapping_Gran	•OMPS-TC-Grid-To-Gran-GridIP-Mapping-IP	•None	ProGipOmpsTcGridToGranMapping	ProGipOmpsTcGridToGranSnowIceFraction	OMPS TC RDR/SDR	OMPS TC RDR/SDR
12	•OMPS_TC_Mapping_Gran	•OMPS-TC-Grid-To-Gran-GridIP-Mapping-IP	•None	ProGipOmpsTcGridToGranMapping	Store Products to DMS	OMPS TC RDR/SDR	Store/Retrieve

	Data Product Name	Collection Short Name	Mnemonic	Sending Function	Receiving Function	Sending SRS	Receiving SRS
13	•OMPS_TC_GIP_SNOW_ICE_FRACTION_GRAN	•OMPS-TC-GridIP-VIIRS-Snow-Ice-Fraction-Gran	•None	ProGipOmpsTcGridToGranSnowIceFraction	Store Products to DMS	OMPS TC RDR/SDR	Store/Retrieve
14	•OMPS_TC_SDR	•OMPS-TC-SDR	•SDRE-OMTC-C0030	ProGipOmpsTcGridToGranSunGlnt	Store Products to DMS	OMPS TC RDR/SDR	Store/Retrieve
15	•OMPS Nadir Total Column Calibration RDR •OMPS TC Science RDR •OMPS Nadir Total Column Diagnostic Earth View RDR •OMPS Nadir Total Column Diagnostic Calibration RDR	•OMPS-TCCALIBRATION-RDR •OMPS-TCSCIENCE-RDR •OMPS-TCDIAGNOSTIC-RDR •OMPS-TCDIAGCAL-RDR	•RDRE-OMPS-C0051 •RDRE-OMPS-C0031 •RDRE-OMPS-C0050 •RDRE-OMPS-C0038	Passthrough OMPS TC RDRs	Store Products to DMS	OMPS TC RDR/SDR	Store/Retrieve
16	•OMPS_TC_GEO •OMPS-TC-RGEO	•OMPS-TC-GEO •OMPS-TC-GEO	•None •None	ProSdrOmpsTcEarth	Store Products to DMS	OMPS TC RDR/SDR	Store/Retrieve
17	•OMPS_TC_GLINTLESS_SDR	•OMPS-TC-Glintless-SDR	•None	ProSdrOmpsTcEarth	Store Products to Heap	OMPS TC RDR/SDR	Store/Retrieve

3.3.2 Outputs

SRS.01.04_67 The OMPS RDR software shall generate the OMPS Nadir Total Column Diagnostic Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><DiagCal>.

Rationale: The Diagnostic Calibration RDR is one of OMPS Nadir Total Column 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-1, JPSS-2

SRS.01.04_68 The OMPS RDR software shall generate the OMPS Nadir Total Column Diagnostic Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><DiagEarthView>.

Rationale: The Diagnostic Earth View RDR is one of OMPS Nadir Total Column 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-1, JPSS-2

SRS.01.04_69 The OMPS RDR software shall generate the OMPS Science Nadir Total Column Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><Cal>.

Rationale: The Calibration RDR is one of OMPS Nadir Total Column 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-1, JPSS-2

SRS.01.04_70 The OMPS RDR software shall generate the OMPS Science Nadir Total Column Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><Science>.

Rationale: The Science Earth View RDR is one of OMPS Nadir Total Column RDR products and is generated from the specified mission data packet APIDs. APIDs 0, 8, and 11 are part of the Spacecraft Diary which is included in the deliverable RDR.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_99 The OMPS Nadir Total Column SDR software shall generate the OMPS Nadir Total Column Science SDR, conforming to the XML format file in Attachment A.4 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS Total Column RDR/SDR (474-00448-02-04).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_118 The OMPS Nadir Total Column SDR software shall generate the OMPS Nadir Total Column Science SDR geolocation in conformance with the XML format file in Attachment A.3 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS Total Column RDR/SDR (474-00448-02-04).

Rationale: The product profile must conform to the XML format file.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.4 Science Standards

Not applicable.

3.5 Metadata Output

Not applicable.

3.6 Quality Flag Content Requirements

SRS.01.04_116 The OMPS Nadir Total Column SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Science_SDR><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_499 The OMPS Nadir Total Column SDR GEO software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Sci_GEO><QF>.

Rationale: Quality Flags must be generated based on the established flag conditions, logic, and format.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

3.7 Reserved

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

SRS.01.04_495 The JPSS Common Ground System shall execute the OMPS Nadir Total Column earth view radiance algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

SRS.01.04_496 The JPSS Common Ground System shall execute the OMPS Nadir Total Column science SDR geolocation algorithm.

Rationale: The CGS must incorporate algorithm changes that are supplied by the algorithm vendor.

Mission Effectivity: S-NPP, JPSS-1, JPSS-2

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 Table lists each requirement with CM-controlled attributes including requirement type, mission effectivity, requirement allocation(s), block start and end, method(s) for verifying each requirement, etc.

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
SRS.01.04_487	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with an albedo calibration accuracy of 2%.	P	SDR	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_488	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with spectral pixel-to-pixel calibration accuracy of 0.5%.	P	SDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_489	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance holding the out-of-band stray light to less than 1% at all wavelengths.	P	SDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_658	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance over the wavelength range of 302 to 382 nm.	P	SDR	S-NPP	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_490	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance over the wavelength range of 300 to 420 nm.	P	SDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_659	The OMPS Nadir Total Column algorithm shall calculate the earth view radiance with a	P	SDR	S-NPP	algorithm provider	2.0.0	3.0.0	Test	NA	NA

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
	horizontal cell size of 50 km at nadir.									
SRS.01.04_491	The OMPS Nadir Total Column algorithm shall calculate and/or aggregate the earth view radiance with a horizontal cell size of 50 km or less at nadir.	P	SDR	JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_661	The OMPS Nadir Total Column SDR Geolocation algorithm computation shall have a one-sigma mapping uncertainty of 5 km.	P	GEO	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Test	NA	NA
SRS.01.04_492	The OMPS Nadir Total Column SDR software shall incorporate a computing algorithm provided for earth-view radiances.	Ap	SDR	S-NPP JPSS-1 JPSS-2	algorithm provider	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_107	The OMPS Nadir Total Column SDR software shall set the <FillField> values to <FillValue> for <FillCondition> specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Science_SDR><fill>.	E	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_100	The OMPS Nadir Total Column SDR software shall incorporate inputs specified in Table 3-1.	I	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_119	The OMPS Nadir Total Column SDR Geolocation software shall	I	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
	incorporate inputs specified in Table 3-1.									
SRS.01.04_662	The OMPS Nadir Total Column SDR software shall ingest input tables and coefficients formatted in accordance with Section 7 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS NP RDR/SDR (474-00448-02-04).	Ft	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_67	The OMPS RDR software shall generate the OMPS Nadir Total Column Diagnostic Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><DiagCal>.	F	RDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_68	The OMPS RDR software shall generate the OMPS Nadir Total Column Diagnostic Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><DiagEarthView>.	F	RDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
SRS.01.04_69	The OMPS RDR software shall generate the OMPS Science Nadir Total Column Calibration RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><Cal>.	F	RDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_70	The OMPS RDR software shall generate the OMPS Science Nadir Total Column Earth View RDR from mission data packet APIDs specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04)<NTC_RDR><Science>.	F	RDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_99	The OMPS Nadir Total Column SDR software shall generate the OMPS Nadir Total Column Science SDR, conforming to the XML format file in Attachment A.4 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS Total Column RDR/SDR (474-00448-02-04).	F	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_118	The OMPS Nadir Total Column SDR software shall generate the OMPS Nadir Total Column Science SDR geolocation in	Fg	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
	conformance with the XML format file in Attachment A.3 of the JPSS Algorithm Specification Vol II: Data Dictionary for OMPS Total Column RDR/SDR (474-00448-02-04).									
SRS.01.04_116	The OMPS Nadir Total Column SDR software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Science_SDR><QF>.	Q	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_499	The OMPS Nadir Total Column SDR GEO software shall report for each <FlagScope> quality flags using <FlagLogic> as specified in the JPSS Algorithm Specification Vol IV: SRSPF for OMPS Total Column RDR/SDR (474-00448-04-04) <NTC_Sci_GEO><QF>.	Q	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_495	The JPSS Common Ground System shall execute the OMPS Nadir Total Column earth view radiance algorithm.	Ai	SDR	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA
SRS.01.04_496	The JPSS Common Ground System shall execute the OMPS	Ai	GEO	S-NPP JPSS-1 JPSS-2	CGS	2.0.0	3.0.0	Inspection	NA	NA

Req ID	SRS 04 - Ozone Mapping and Profiler Suite-Total Column	Level 3 Type	Product Type	Mission Effectivity	Allocated To	Block Start	Block End	Block 2.0.0 VM	Block 2.1.0 VM	Block 2.2.0 VM
	Nadir Total Column science SDR geolocation algorithm.									