For the Blue Bar

The Messenger MASCS VIRS Archive

For the Orange Bar

Calibrated Data Record (CDR)

**Calibrated Data Record (CDR)**

The VIRS data cover a wavelength range from 300 to 1050 nm (VIS) and 850-1450 nm (NIR). The VIRS Calibrated Data Records (CDRs) consist of calibrated data derived from MASCS VIRS Experimental Data Records (EDR).

The data span Earth, Venus and Mercury fly-bys and routine orbital observations began on March 29, 2011.

The CDR archive is arranged according to mission phase: Launch (lau), Earth Cruise (eac), Earth Flyby (eaf), Venus 1 & 2 Cruise (vc 1 & 2), Venus 2 Flyby (vf2), Mercury Cruise 1-4 (mc1-4) , Mercury flyby 1-3 (mf1-3) , Mercury Orbit 1-5 (orb, orb2-5). Then by day, which includes UVVS (UV to visible) and VIRS (visible to IR). Within VIRS the data are subdivided according to VIS and NIR and, within each category, a science and housekeeping file compose an individual data product.

**Useful Documents**

Useful documents located in the documents directory link to <https://pds-atmospheres.nmsu.edu/cgi-bin/getdir.pl?dir=document&volume=messmas_2101/>

are:

VIRS\_TUTORIAL.PDF: MASCS VIRS Tutorial/User's Guide in PDF/A format.

VIRS\_CDR\_DDR\_DAP\_SIS.PDF: The MASCS VIRS CDR/DDR/DAP SIS: "MESSENGER MASCS VIRS Calibrated Data Record, Derived Data Record, and Derived Analysis Product Software Interface Specification"

VIRS\_EDR2CDR.TXT: Detailed procedures and tables for EDR to CDR calibration.

VIRS\_CDR2DDR.TXT: Detailed procedures and tables for CDR to DDR data reduction.

MASCS\_CAL\_RPT.PDF: The MESSENGER instrument calibration report for MASCS, in Adobe Acrobat format.

VIRS\_DARK\_ANALYSIS\_REPORT\_1.PDF: "VIRS IR Dark Analysis Report 1: Operational Changes" Details the evolving understanding of MASCS dark current during Mercury orbit, describing temperature dependence and effects on the NIR data in particular.

VIRS\_DARK\_ANALYSIS\_REPORT\_2.PDF: "VIRS IR Dark Analysis Report 2: Calibration Changes". Describes the adjustments to

MASCS calibration to improve dark subtraction and account for pixels saturated due to temperature.

VIRS\_CALIBRATION\_CHANGES\_PDS9.PDF: "VIRS Calibration Changes for PDS Delivery 9" Describes the calibration changes

implemented to simplify the handling of dark subtractions for VIRS, and an adjustment to the DATA\_QUALITY\_INDEX provided in the data records.

VIRS\_CALIBRATION\_CHANGES\_PDS11.PDF: "VIRS Calibration Changes for PDS Delivery 11" Describes changes to the calibration

procedure that have been implemented to remedy an observed shift in the wavelength scale of the VIRS visible channel.

VIRS\_FLATFIELD\_REPORT.PDF: "MASCS/VIRS Lamp-Based Flat Field Report" Describes the results of an investigation to derive a

flat-field correction for the MASCS VIRS surface observations.

**Access to the Calibrated Data**

The CDRs link to <https://pds-atmospheres.nmsu.edu/cgi-bin/getdir.pl?volume=messmas_2101/>

are in binary format and each is described by a detached PDS label. Detailed descriptions of the parameters in the label can be found in the label directory link to <https://pds-atmospheres.nmsu.edu/cgi-bin/getdir.pl?dir=label&volume=messmas_2101>.

See the VIRS Calibrated and Derived Data Record Software Interface Specification Document <https://pds-atmospheres.nmsu.edu/PDS/data/messmas_2101//document/virs_cdr_ddr_dap_sis.pdf> for a detailed description of the instrument and the calibrated data.

**Quick Look Indices**

Indices for Calibrated data for the Near IR and Visible date for Specific Mission Phases – Individual files can be selected based on observational parameters and the corresponding URNs submitted below to retrieve the files.

Link the following files

Launch to Insertion cvs

Mercury Orbit 1 csv

Mercury Orbit 2 csv

Mercury Orbit 3 csv

Mercury Orbit 4 csv

Mercury Orbit 5 csv

**Selecting Data at the file level**

**Accessing Binary Files**

An IDL tool which translates the CDR binary files is available (See side bar)