

README File

Daily OLR CDR Production Script Guide

v01r02

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Introduction

This document explains the scripts used for the Daily OLR CDR Production.

This file is located in <src>/Documents/Daily_OLR_CDR_v01r02_Production_Script_Guide.doc.

The Daily OLR CDR Production includes the following steps:

1. Compile.sh / Compile_touch.sh – clean (or touch) compilation of all Fortran programs
2. OLR_CDR_Production.sh - Daily OLR CDR Production driver script
3. OLR retrieval
 - a. OLR_retrieval.sh – HIRS radiance calibration and OLR retrieval
 - b. OLR_retrieval_Gridsat.sh – Imager OLR retrieval and gridding using Gridsat CDR data (for full CDR production)
 - c. OLR_retrieval_GSIP.sh – Imager OLR extraction and gridding from GSIP product (for Interim CDR production)
4. OLR gridding
 - a. OLR_gridder2a.sh – Gridding of orbital HIRS OLR map (optional)
 - b. OLR_gridder2b.sh – Gridding of hourly HIRS OLR map
5. OLR_Daily_integral.sh – Intersatellite bias adjustment and monthly mean temporal integral
6. OLR_packer_batch.sh – Pack into NetCDF-4 product file

Execute Compile.sh and OLR_CDR_Production.sh scripts to launch the production.

The OLR CDR Production HOME directory contains the following structure:

```
$home /Documentations
      /Scripts
      /Codes
      /Utility
      /Data_static
      /Work
```

The OLR CDR Production WORK directory will generate the following structure:

```
$work /data_lb - a symbolic link to HIRS-1b data directory
      /OLR_fov - contains OLR fov retrievals
      /Monthly - contains Monthly orbital maps
      /OLR_CDR - contains OLR CDR monthly mean product
      /OLR_CDR/archive_ascii - Initial state of OLR CDR monthly mean data (it currently
contains data from 1979.01 to 2013.12)
```

1. Compile.sh and Compile_touch.sh

Purpose:

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- Compilation of all Fortran programs used in OLR CDR Production.

Usage:

For clean compilation: `Compile.sh <production_home_dir>`

To update compilation: `Compile_touch.sh <production_home_dir>`

2. OLR_CDR_Production.sh

Purpose:

- Main driving script for Daily OLR CDR Production.
- In automated mode, it is to be executed once a month, presumed to be on the 5th day of a month.
- It can also be invoked with an argument of <yyyymm> to specify the month to be processed.

Usage (Automated):

To generate OLR for the previous month: `OLR_CDR_Production.sh`

Usage (Manual):

To generate OLR for a given month <yyyymm>: `OLR_CDR_Production.sh <yyyymm>`

Note: The netCDF product generated will contain whatever monthly data currently in /Work/CDR/ascii_archive folder plus a newly generated <yyyymm> month.

User Configurable Variables (examples):

```
# User configurable -----
# OLR CDR Product version numbers
ver='01'
rev='02'

Production_home= /Daily_OLR_CDR_Production
Production_work= /Daily_OLR_CDR_Production/work
HIRS1b= /HIRS1b

# Satellites to be processed
# ; all possible since 1979.01
satids='N05 N06 N07 N08 N09 N10 N11 N12 N14 N15 N16 N17 N18 N19 N20 N21'

# End of user configuration -----
```

Input:

- HIRS Level-1b data
- Static input data

Output:

- Daily OLR CDR product (netCDF4 format)
- Intermediate output files: HIRS OLR FOV retrievals, HIRS hourly OLR maps, Imager 3-hourly OLR maps, OLR daily maps, logs, etc.

3. OLR retrieval

a. OLR_retrieval.sh

Purpose:

- Retrieval OLR at each HIRS field of view (FOV).
- HIRS radiance calibration is included in this step.
- This script assumes that the HIRS Level-1b CLASS archive is reachable by the script.

Usage:

OLR_retrieval.sh <satid> <yyyy> <mm> <dd> <yday>

Input:

- <work>/Data_1b/<satid>/<yyyy>/ - HIRS Level-1b data
- Ancillary static input
 - <src>/Data_static/cali_data/<satid> - HIRS radiance calibration input
 - <src>/Data_staic/OLR_coef/<satid> - HIRS OLR regression coefficients

Output:

- OLR retrievals swath files at fov level: <work>/OLR_fov/<satid>/<yyyy>/<mm>

b. OLR_retrieval_Gridsat.sh

Purpose:

- Retrieve Imager OLR with brightness temperature data extracted from Girdsat CDR
- Output 3-hourly 1°x1° Imager OLR data for full CDR production.

Usage:

OLR_retrieval_Gridsat.sh <yyyy> <mm> <dd> <yday>

Input:

- <work>/Gridsat/<yyyy>/ - Gridsat CDR data

Output:

- OLR 3 hourly 1°x1° map: <work>/OLR_Gridsat/

c. OLR_retrieval_GSIP.sh

Purpose:

- Extract Imager OLR from GSIP product
- Output 3-hourly 1°x1° Imager OLR data for interim CDR production.

Usage:

OLR_retrieval_GSIP.sh <satid> <yyyy> <mm> <dd> <yday>

Input:

- <work>/GSIP/<satid>/<yyyy>/ - GSIP products

Output:

- OLR 3 hourly 1°x1° map: <work>/OLR_GSIP/

4. OLR_gridder_2a.sh / OLR_gridder_2b.sh

Purpose:

- Grid OLR FOV retrievals into 1°x1° nodal and hourly maps
- These OLR nodal maps stamped in Local times of the ascending/descending equator crossing times.
- These OLR hourly maps stamped in UTC time. This is the data used in daily OLR production.

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Usage:

OLR_gridder_2a.sh <satid> <yyyy> <mm> <dd> <yday>

OLR_gridder_2b.sh <satid> <yyyy> <mm> <dd> <yday>

Input:

- <work>/OLR_fov /<satid>/<yyyy>/<mm> - OLR retrievals swath files

Output:

OLR_gridder_2a.sh

- OLR 1x1 nodal maps: <work>/Nodal/OLR_nodal_mean_<satid>_<yyyy>d<yday>.dat
- mean ascending ECT: <work>/Nodal /ECT_nodal_mean_<satid>_<yyyy>d<yday>.dat

OLR_gridder_2a.sh

- OLR 1x1 hourly maps: <work>/Hourly/OLR_hourly_mean_<satid>_<yyyy>d<yday>.dat
- mean ascending ECT: <work>/Hourly /ECT_hourly_mean_<satid>_<yyyy>d<yday>.dat

5. OLR_Daily_integral.sh

Purpose:

- Derive daily mean OLR given the HIRS hourly OLR and Imager 3-hourly OLR maps, all in 1°x1° grid.

Usage:

OLR_Daily_integral.sh <yyyy> <mm> <dd> <yday>

Input:

- # \$work/Hourly/Hourly/OLR_hourly_mean_<satid>_<yyyy>d<yday>.dat – HIRS hourly mean OLR for a given satellites
- # \$work/OLR_Gridsat/ – Gridsat 3-hourly mean OLR
- # \$work/OLR_GSIP/ – GSIP 3-hourly mean OLR
- # \$src/Data_static/Intersat_Adjustment_Ed2.7.dat - contains inter-satellite bias adjustments for HIRS OLR

Output:

- <work>/Daily>/OLR_monthly_mean.<yyyy><mm>.dat – Daily OLR CDR (binary)

6. NetCDF Packing

a. OLR_packer_annual.sh

Purpose:

- Pack one year worth of Daily OLR CDR data into a NetCDF4 data file.

Usage:

OLR_packer_annual.sh <yyyy> <ver> <rev>

Input:

- <work>/Daily>/OLR_monthly_mean.<yyyy><mm>.dat – Daily OLR CDR (binary)
- \$yyyy = Target year
- \$ver = OLR CDR Product Version number
- \$rev = OLR CDR Product Revision number
- <work>/Daily/<yyyy>/OLR_daily_<yyyy>d<yday>.dat

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Output:

- Daily OLR CDR: <work>/OLR_CDR/daily_olr_v<ver>r<rev>_<yyyy>0101_<yyyy>1231.nc