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## 1. Daily OLR CDR/brightn.f90 [ Programs ]

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### NAME

**brightn.f90**

### LOCATION

Codes/OLR\_retrieval/Nxx/, xx=05,06, ...,21

### PURPOSE

Calculate Brightness temperature (deg K) for given radiance (mW m<sup>-2</sup> (cm<sup>-1</sup> sr)<sup>-1</sup>)

### DESCRIPTION

This F90 subroutine Calculate Brightness temperature (deg K) for given radiance (mW m<sup>-2</sup> (cm<sup>-1</sup> sr)<sup>-1</sup>).

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[instrument.cmn.f90](#)  
[phys\\_const.cmn.f90](#)

## INPUTS

r - radiance (mW m<sup>-2</sup> (cm<sup>-1</sup> sr)<sup>-1</sup>)  
k - HIRS channel number (1-19)

## OUTPUTS

return brightness temperature (deg K)

## HISTORY

2010-11-26 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 2. Daily OLR CDR/cal\_date2.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

[distribute\\_codes.sh](#)

## PURPOSE

Calculate Date with or without offset

## DESCRIPTION

This script calculates Date with or without offset, using 4-digit year

## USAGE

1. **cal\_date2.sh** => returns today's date `yyyymmdd`
2. **cal\_date2.sh** `yyyy mm dd offset` => returns the date offset from the given date
3. **cal\_date2.sh** `yyyymmdd offset` => returns the date offset from the given date

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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INPUT

OUTPUT

HISTORY

2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

3. Daily OLR CDR/cal\_julday2.sh [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

cal\_julday2.sh

PURPOSE

Calculate Day of the Year for the given date

DESCRIPTION

This script calculates Day of the Year for the given date.

USAGE

cal\_julday2.sh yyyyymmdd => returns the day of the year for the given date yyyyymmdd

AUTHOR

Hai-Tien Lee

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INPUT

OUTPUT

HISTORY

2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

## 4. Daily OLR CDR/cal\_num\_of\_days.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

```
cal_num_of_days.sh
```

### PURPOSE

```
Calculate number of days from day1 to day2
```

### DESCRIPTION

```
This script calculates number of days from day1 to day2 (counting day1 as 1)
```

### USAGE

```
cal_num_of_days.sh $yyyymmdd1 $yyyymmdd2
```

### AUTHOR

```
Hai-Tien Lee
```

### COPYRIGHT

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THE USE OF THE SOFTWARE AND DOCUMENTATION; OR (2) TO PROVIDE TECHNICAL  
SUPPORT TO USERS.
```

### INPUT

### OUTPUT

### HISTORY

```
2014-06-01   Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 5. Daily OLR CDR/cal\_yday2date.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

cal\_yday2date.sh

PURPOSE

Calculate the Calendar date given the Day of the Year

DESCRIPTION

This script calculates the Calendar date given the Day of the Year

USAGE

[cal\\_num\\_of\\_days.sh](#) \$yyyy \$yday

AUTHOR

Hai-Tien Lee

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INPUT

OUTPUT

HISTORY

2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

6. Daily OLR CDR/calc\_lza.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

calc\_lza.f90

LOCATION

Codes/OLR\_retrieval/Nxx/,    xx=05,06,07,08,09,10,11,12,14

PURPOSE

Calculate LZA for each scan position given the LZA at the first spot and satellite height.

## DESCRIPTION

Prior to N14, the LZA derivation is only done at the first spot of a scan line. This program estimate the LZA at all scan positions assuming a constant 1.8 degree satellite view angle step. See Lee et al., 2007 for detail.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[superdata.cmn.f90](#)

## INPUTS

## OUTPUTS

## HISTORY

2003-08-08	Hai-Tien Lee Created
2011-03-30	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2012-04-09	Hai-Tien Lee Change LZA to carry signs to indicate direction of scans.
2012-04-09	Hai-Tien Lee Add sva_offset magnitude detection to handle wrong first spot LZA values given by HIRS-1b data.
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 7. Daily OLR CDR/calc\_olr\_HIRS2.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

calc\_olr\_HIRS2.f90

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

## PURPOSE

Performs HIRS OLR retrieval

## DESCRIPTION

Given calibration radiance and related info (hirsdat), this F90 subroutine calculate OLR using Ellingson et al. (1989) algorithm for the given satellite (satid)

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[superdata.cmn.f90](#)

## INPUTS

hirsdat - holding array for calibrated HIRS radiances and related info (via common block)  
satid - satellite id  
olr\_coeff - static data  
crec - record number for direct access binary output file

## OUTPUTS

olrdat(13,56,40) - containing OLR, input radiance, geolocation, lza, & timing info

## HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2012-04-09	Hai-Tien Lee Add absolute function for LZA to index m conversion (line 84).
2013-08-23	Hai-Tien Lee Add QC on radiance 1. define rad min and max, 2. QC zero on all radiances
2013-09-12	Hai-Tien Lee Add target_day check
2013-11-29	Hai-Tien Lee Revise OLR model to v2.7: [3,7,8,11, sq(8),sqrt(11),sqrt(12)] Scale radiance to mW/m-2 (sr cm-1)-1 first
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 8. Daily OLR CDR/calc\_olr\_HIRS34.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

`calc_olr_HIRS34.f90`

## LOCATION

Codes/OLR\_retrieval/Nxx/calc\_olr\_HIRS3.f, xx=15,16,...,21

## PURPOSE

Performs HIRS OLR retrieval

## DESCRIPTION

Given calibration radiance and related info (hirsdat), this F90 subroutine calculate OLR using Ellingson et al. (1989) algorithm for the given satellite (satid)

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[type\\_def.f90](#)  
[superdata.cmn.f90](#)

## INPUTS

hirsdat - holding array for calibrated HIRS radiances and related info (via common block)  
satid - satellite id  
olr\_coeff - static data  
crec - record number for direct access binary output file

## OUTPUTS

olrdat(13,56,40) - containing OLR, input radiance, geolocation, lza, & timing info

## HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2012-04-09	Hai-Tien Lee Add absolute function for LZA to index m conversion (line 84).
2013-08-23	Hai-Tien Lee Add QC on radiance 1. define rad min and max, 2. QC zero on
all radiances	
2013-09-12	Hai-Tien Lee Add target_day check
2013-11-29	Hai-Tien Lee Revise OLR model to v2.7: [3,7,8,11, sq(8),sqrt(11),sqrt(12)] Scale radiance to mW/m-2 (sr cm-1)-1 first
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 9. Daily OLR CDR/Compile.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

`Compile.sh`

### PURPOSE

Prepare executables used in OLR CDR Production

### DESCRIPTION

This script calls the individual makefile to prepare all the executables.

### USAGE

`Compile.sh`

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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### INPUT

### OUTPUT

### HISTORY

2011-03-07	Hai-Tien Lee.
2011-03-27	Hai-Tien Lee, Add compilation of N05-N14 OLR_retrieval codes
2013-11-20	Hai-Tien Lee, Add N21
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 10. Daily OLR CDR/Compile\_touch.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

`Compile_touch.sh`

## PURPOSE

Prepare executables used in OLR CDR Production

## DESCRIPTION

This script calls the individual makefile to prepare all the executables.  
Only touch those have been modified.

## USAGE

[Compile.sh](#)

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## INPUT

## OUTPUT

## HISTORY

2011-03-07	Hai-Tien Lee.
2011-03-27	Hai-Tien Lee, Add compilation of N05-N14 OLR_retrieval codes
2013-11-20	Hai-Tien Lee, Add N21
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 11. Daily OLR CDR/define\_pred\_version.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**define\_pred\_version.sh**

## PURPOSE

Define source of the prediction coefficients file used in McMillin calibration algo~~rthm~~

## DESCRIPTION

```
McMillin      This script defines source of the prediction coefficients file used in
               calibration algorithm
```

## USAGE

```
define_pred_version.sh
```

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## INPUT

## OUTPUT

```
pred_cali_oper.dat file is created in each Data_static/cali_data/Nxx directory
```

## HISTORY

```
2014-06-01   Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 12. Daily OLR CDR/distribute\_codes.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

```
distribute_codes.sh
```

## PURPOSE

```
Distribute common codes to Code directory for each satellite
```

## DESCRIPTION

```
satellite      This script distributes OLR retrieval codes to Code directory for each
```

## USAGE

```
distribute_codes.sh $home
```

\$home is the production home directory

AUTHOR

Hai-Tien Lee

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INPUT

OUTPUT

HISTORY

2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

13. Daily OLR CDR/extract\_bit\_int2.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

**extract\_bit\_int2.f90**

LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Bit extractions for a two-byte integer

DESCRIPTION

Given a two-byte integer, the bit pattern is extracted.

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

14. Daily OLR CDR/extract\_msec.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

`extract_msec.f90`

LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Extract mili-second value from level-1b header

DESCRIPTION

Extract mili-second value from level-1b header

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01 Hai-Tien Lee Created  
2010-11-26 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

15. Daily OLR CDR/extract\_year.f90 [ Programs ]

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NAME

extract\_year.f90

LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Extract year value from level-1b header

DESCRIPTION

Extract year value from level-1b header

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01    Hai-Tien Lee Created  
2010-11-26    Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

16. Daily OLR CDR/get\_hirs\_HIRS2.f90 [ Programs ]

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NAME

`get_hirs_HIRS2.f90`

LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Performs HIRS radiance calibration

DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES  
[type\\_def.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
hirs\_cali.f90

INPUTS

onehir - one superswath of HIRS level 1b data passed in through common block

OUTPUTS

hirsdat(35,56,40) - containing calibrated radiance and geolocation, lza, & timing info

HISTORY

2003-01-01    Original Code (atovmain.f) obtained from L. McMillin  
2010-11-26    Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

17. Daily OLR CDR/get\_hirs\_HIRS3.f90 [ Programs ]

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NAME

get\_hirs\_HIRS3.f90

LOCATION

Codes/OLR\_retrieval/Nxx, xx=15,16,17

PURPOSE

Performs HIRS radiance calibration

DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES  
[type\\_def.f90](#)

[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
hirs\_cali.f90

INPUTS

onehir - one superswath of HIRS level 1b data passed in through common block

OUTPUTS

hirsdat(35,56,40) - containing calibrated radiance and geolocation, lza, & timing info

HISTORY

2003-01-01    Original Code (atovmain.f) obtained from L. McMillin  
2003-08-26    Hai-Tien Lee for NOAA-KLM  
2010-11-26    Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

18. Daily OLR CDR/get\_hirs\_HIRS4.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

get\_hirs\_HIRS4.f90

LOCATION

Codes/OLR\_retrieval/Nxx, xx=18, 19, 20

PURPOSE

Performs HIRS radiance calibration

DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

AUTHOR

Hai-Tien Lee

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## EXTERNALS

### DEPENDENCIES

[type\\_def.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
hirs\_cali.f90

## INPUTS

onehir - one superswath of HIRS level 1b data passed in through common block

## OUTPUTS

hirsdat(35,56,40) - containing calibrated radiance and geolocation, lza, & timing info

## HISTORY

2003-01-01	Original Code (atovmain.f) obtained from L. McMillin
2003-08-26	Hai-Tien Lee for NOAA-KLM
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 19. Daily OLR CDR/grid\_olr\_1deg\_hrly.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

grid\_olr\_1deg\_hrly.f90

## LOCATION

Codes/Gridder\_2b

## PURPOSE

Grid OLR fov retrievals into 1x1 deg hourly maps

## DESCRIPTION

HIRS OLR retrievals are produced at each field of view (FOV). They are gridded into 1x1 deg hourly maps (360x180x24)

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

## DEPENDENCIES

[gridder\\_1deg\\_hrly.f90](#)

## INPUTS

FILENAME = File name that contain OLR retrievals  
 OLR\_fov = OLR FOV retrievals (Wm-2 (cm-1 sr)-1)  
 LON\_fov = Longitudes corresponding to OLR\_fov (degrees)  
 LAT\_fov = Latitudes corresponding to OLR\_fov (degrees)  
 Time\_fov = Time (UT) corresponding to OLR\_fov (seconds)

## OUTPUTS

```

OLR_ave_map = OLR hourly maps (360x180x24), mean values
OLR_std_map = OLR hourly maps (360x180x24), STD values
Num_fov_map_all = counter for number of fov retrievals in each grid
ECT = equator crossing time. Local hour in real number.
Working variables
  OLR_sum_map = OLR hourly maps (360x180x24), sum, tally over a day
  OLR_var_map = OLR hourly maps (360x180x24), variances, tally over a day
  Missing_map = Mask map (360x180x24) indicating missing grids.
                  0=good data; 1=assigned missing.
                  Currently Missing is only QC'ed by number of
observations.

```

## HISTORY

2013-09-12 Hai-Tien Lee Modified for 1-degree hourly gridding  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 20. Daily OLR CDR/grid\_olr\_1deg\_nodal.f90 [ Programs ]

[\[ Top \]](#) [\[ Programs \]](#)

## NAME

```
grid_olr_1deg_nodal.f90
```

## LOCATION

Codes/Gridder\_2a

## PURPOSE

Grid OLR fov retrievals into 1x1 deg nodal maps

## DESCRIPTION

HIRS OLR retrievals are produced at each field of view (FOV). They are gridded into 1x1 deg nodal (ascending and descending) maps (360x180x2)

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[gridder\\_1deg\\_nodal.f90](#)

## INPUTS

FILENAME = File name that contain OLR retrievals  
OLR\_fov = OLR FOV retrievals (Wm-2 (cm-1 sr)-1)  
LON\_fov = Longitudes corresponding to OLR\_fov (degrees)  
LAT\_fov = Latitudes corresponding to OLR\_fov (degrees)  
Time\_fov = Time (UT) corresponding to OLR\_fov (seconds)

## OUTPUTS

OLR\_ave\_map = OLR hourly maps (360x180x24), mean values  
OLR\_std\_map = OLR hourly maps (360x180x24), STD values  
Num\_fov\_map\_all = counter for number of fov retrievals in each grid  
ECT = equator crossing time. Local hour in real number.  
Working variables  
OLR\_sum\_map = OLR hourly maps (360x180x24), sum, tally over a day  
OLR\_var\_map = OLR hourly maps (360x180x24), variances, tally over a day  
Missing\_map = Mask map (360x180x24) indicating missing grids.  
                    0=good data; 1=assigned missing.  
                    Currently Missing is only QC'ed by number of  
observations.

## HISTORY

2013-09-12	Hai-Tien Lee Modified for 1-degree nodal gridding
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 21. Daily OLR CDR/gridder\_1deg\_hrly.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**gridder\_1deg\_hrly.f90**



2011-04-14	Hai-Tien Lee	Change handling of missing ECT from STOP to RETURN.
2013-09-25	Hai-Tien Lee	Modified for 1-deg hourly gridding
2014-06-01	Hai-Tien Lee	for NCDC Daily OLR CDR Production

## 22. Daily OLR CDR/gridder\_1deg\_nodal.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

`gridder_1deg_nodal.f90`

### LOCATION

`Codes/Gridder_2a/`

### PURPOSE

Grid OLR fov retrievals into 1x1 deg ascending nad descending maps

### DESCRIPTION

HIRS OLR retrievals are produced at each field of view (FOV). They are gridded into 1x1 deg maps for ascending and descending orbits. (360x180x2)

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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### EXTERNALS

DEPENDENCIES

### INPUTS

OLR\_fov = OLR FOV retrievals (Wm-2 (cm-1 sr)-1)  
LON\_fov = Longitudes corresponding to OLR\_fov (degrees)  
LAT\_fov = Latitudes corresponding to OLR\_fov (degrees)  
Time\_fov = Time (UT) corresponding to OLR\_fov (seconds)

### OUTPUTS

OLR\_sum\_map = tally of OLR values (360x180x2)

```
OLR_var_map = tally of OLR variances values (360x180x2)
Num_fov_map_all = counter for number of fov retrievals in each grid (360x180x2)
ECT = equator crossing time. Local hour in real number.
```

#### Working variables

```
OLR_sum_map = OLR monthly maps (144x72x2), sum, over a day, returned from GRIDDER
OLR_sum_map_all = OLR monthly maps (144x72x2), sum, tally over a month
OLR_var_map = OLR monthly maps (144x72x2), variances, over a day, returned from GRIDDER
OLR_var_map_all = OLR monthly maps (144x72x2), variances, tally over a month
Missing_map = Mask map (144x72x2) indicating missing grids.
                0=good data; 1=assigned missing.
```

Currently Missing is only QC'ed by number of

observations.

## HISTORY

```
2011-02-22   Hai-Tien Lee Created
2011-02-28   Hai-Tien Lee for NCDC HIRS OLR CDR Production Pacakge
2011-04-14   Hai-Tien Lee Change handling of missing ECT from STOP to RETURN.
2013-09-25   Hai-Tien Lee Modified for 1-deg nodal gridding
2014-06-01   Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 23. Daily OLR CDR/Gridsat\_OLR\_retrieval\_v3.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**Gridsat\_OLR\_retrieval\_v3.f90**

### LOCATION

**Gridsat\_OLR\_retrieval\_v3.f90**

### PURPOSE

Read Gridsat NetCDF4 file and extract IRWIN and IRWVP data.

### DESCRIPTION

Retrieval OLR for Gridsat 3-hrly data (5120x2000) on 1deg resolution (360x180)

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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## EXTERNALS

Dependencies  
none

## INPUTS

Gridsat\_input.nc = hard-wired file name that is a symbolic link to Gridsat data file

NetCDF working variables  
nid = netcdf file id  
stat = error status return  
irwin = IRWIN brightness temperature (packed)  
irwvp = IRWVP brightness temperature (packed)

Variables  
Tf = Flux temperature (deg K)  
OLR = outgoing longwave radiation (Wm-2)  
coef\_one\_channel = OLR model coefficients for one channel configuration  
coef\_two\_channel = OLR model coefficients for two channel configuration  
coef = OLR model coefficients (buffer)  
irwin\_1x1 = IRWIN brightness temperature (in 1x1 grid)  
irwvp\_1x1 = IRWVP brightness temperature (in 1x1 grid)

## OUTPUTS

File "Gridsat\_irwin\_irwvp.out" - binary output of irwin and irwvp data

## HISTORY

2013-10-02	Hai-Tien Lee Created
2014-01-24	Hai-Tien Lee Revised to OLR model v3, use flux temperature
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 24. Daily OLR CDR/hirs\_cali\_HIRS2.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**hirs\_cali\_HIRS2.f90**

### LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06, ...,14

### PURPOSE

Derive radiance calibration coefficients following McMillin method

### DESCRIPTION

Given a HIRS superswath, the calibration coefficients (intercept and gain) are derived following McMillin method.

### AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[type\\_def.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
[phys\\_const.cmn.f90](#)

## INPUTS

suphirs - superswath of 43 lines (1-3,41-43 calibration scans,4-40 earthview)  
satid - satellite id  
olr\_coeff - static data  
crec - record number for direct access binary output file

## OUTPUTS

pslope(42,19) - radiance calibration coefficient, slope term  
pintcpt(42,19) - radiance calibration coefficient, intercept term

## HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 25. Daily OLR CDR/hirs\_cali\_HIRS3.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**hirs\_cali\_HIRS3.f90**

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=15,16,17

## PURPOSE

Derive radiance calibration coefficients following McMillin method

## DESCRIPTION

Given a HIRS superswath, the calibration coefficients (intercept and gain) are derived following McMillin method.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[type\\_def.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
[phys\\_const.cmn.f90](#)

## INPUTS

suphirs - superswath of 43 lines (1-3,41-43 calibration scans,4-40 earthview)  
satid - satellite id  
olr\_coeff - static data  
crec - record number for direct access binary output file

## OUTPUTS

pslope(42,19) - radiance calibration coefficient, slope term  
pintcpt(42,19) - radiance calibration coefficient, intercept term

## HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 26. Daily OLR CDR/hirs\_cali\_HIRS4.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

hirs\_cali\_HIRS4.f90

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=18,19,20

## PURPOSE

Derive radiance calibration coefficients following McMillin method

## DESCRIPTION

Given a HIRS superswath, the calibration coefficients (intercept and gain) are derived following McMillin method.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[type\\_def.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)  
[phys\\_const.cmn.f90](#)

## INPUTS

suphirs - superswath of 43 lines (1-3,41-43 calibration scans,4-40 earthview)  
satid - satellite id  
olr\_coeff - static data  
crec - record number for direct access binary output file

## OUTPUTS

pslope(42,19) - radiance calibration coefficient, slope term  
pintcpt(42,19) - radiance calibration coefficient, intercept term

## HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 27. Daily OLR CDR/hirsrad2.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

hirsrad2.f90

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,...,14

## PURPOSE

Performs HIRS radiance calibration and OLR retrieval

## DESCRIPTION

This F90 program reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998) and perform OLR retrieval using Ellingson et al. (1989, 1994) method.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

### DEPENDENCIES

[brightn.f90](#)  
[calc\\_lza.f90](#)  
[calc\\_olr.f90](#)  
[extract\\_bit\\_int2.f90](#)  
[extract\\_msec.f90](#)  
[extract\\_year.f90](#)  
[get\\_hirs.f90](#)  
[i2move.f90](#)  
[newhirs cali.f90](#)  
[rdhdr\\_1995.f90](#)  
[read\\_instru para.f90](#)  
[swap\\_1995.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)

## INPUTS

## OUTPUTS

## HISTORY

2003-01-01	Modieified from hirsrad2.f from L. McMillin
2011-03-30	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 28. Daily OLR CDR/hirsrad2\_1995.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**hirsrad2\_1995.f90**

### LOCATION

Codes/OLR\_retrieval/Nxx/, xx=11, 12, 14

### PURPOSE

Performs HIRS radiance calibration and OLR retrieval

### DESCRIPTION

This F90 program reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998) and perform OLR retrieval using Ellingson et al. (1989, 1994) method.

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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### EXTERNALS

#### DEPENDENCIES

[brightn.f90](#)  
[calc\\_lza.f90](#)  
calc\_olr.f90  
[extract\\_bit\\_int2.f90](#)  
[extract\\_msec.f90](#)  
[extract\\_year.f90](#)  
get\_hirs.f90  
i2move.f90  
newhirs cali.f90  
[rdhdr\\_1995.f90](#)  
[read\\_instru\\_para.f90](#)  
[swap\\_1995.f90](#)  
[superdata.cmn.f90](#)  
[instrument.cmn.f90](#)

### INPUTS

OUTPUTS

HISTORY

2003-01-01    Modieified from hirsrad2.f from L. McMillin  
2011-03-30    Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

29. Daily OLR CDR/instrument.cmn.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

`instrument.cmn.f90`

LOCATION

`Codes/OLR_retrieval/Nxx, xx=15,16,...,21`

PURPOSE

`Declaration for instrument parameters`

DESCRIPTION

`Other programs use INCLUDE to declare common instrument parameters defined here.`

AUTHOR

`Hai-Tien Lee`

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EXTERNALS

`DEPENDENCIES`

INPUTS

OUTPUTS

HISTORY

2003-08-01 Hai-Tien Lee Created  
2010-11-26 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

# 30. Daily OLR CDR/instrument.cmn.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

instrument.cmn.f90

## LOCATION

Codes/OLR\_retrieval/Nxx/, xx=05,06,07,08,09,10,11,12,14

## PURPOSE

Declaration for instrument parameters

## DESCRIPTION

Other programs use INCLUDE to declare common instrument parameters defined here.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES

## INPUTS

## OUTPUTS

## HISTORY

2003-08-01 Hai-Tien Lee Created  
2010-11-26 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 31. Daily OLR CDR/instrument.cmn.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

instrument.cmn.f90

### LOCATION

Codes/OLR\_retrieval/Nxx, xx=15,16,...,21

### PURPOSE

Declaration for instrument parameters

### DESCRIPTION

Other programs use INCLUDE to declare common instrument parameters defined here.

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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### EXTERNALS

DEPENDENCIES

### INPUTS

### OUTPUTS

### HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 32. Daily OLR CDR/OLR\_CDR\_nc4\_batch.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

OLR\_CDR\_nc4\_batch.f90

## LOCATION

Codes/Packer/OLR\_CDR\_nc4\_batch.f90

## PURPOSE

Pack OLR CDR data into a NetCDF4 data file.

## DESCRIPTION

Giving monthly mean OLR data (144x72xNMON), nmon=num of months, this program packs the OLR CDR time series data into NetCDF4 data file

## AUTHOR

Hai-Tien Lee

## CREATION DATE

2011-03-06

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
none

## INPUTS

```
time_len = number of month of monthly mean OLR data
olr = monthly mean OLR data, 144x72xtime_len
version = global attribute: version
history = global attribute: history
comment = global attribute: comment
time_template = pre-calculated monthly time stamp for 720 months in 'days since
1979.01.01' unit

NetCDF working variables
nid = netcdf file id
stat = error status return
lat = latitude
lon = longitude
lat_len = 72, parameter to define lat dimension
lon_len = 144, parameter to define lon dimension
bnds_len = 2, parameter to define bnds dimension
```

## OUTPUTS

File "OLR\_CDR\_output.nc" - NetCDF4 product file containing time series of OLR monthly mean fields

## HISTORY

2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 33. Daily OLR CDR/OLR\_CDR\_Production.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**OLR\_CDR\_Production.sh**

### PURPOSE

HIRS OLR CDR Production Script to be executed daily

### DESCRIPTION

This is the main script that drives the Daily OLR CDR production.

### USAGE

```
1. For automated execution, "yesterday" will be processed:
> OLR_CDR_Production
2. For manual execution or testing, the argument <yyyymmdd> is the target day to
be processed:
> OLR_CDR_Production <yyyymmdd>
```

Script structure

0. Set up environment (user configurable)
1. Determine the month to be processed
2. Stage HIRS1b data
3. Perform OLR retrieval for HIRS and Imager
4. Perform Gridding for HIRS OLR
5. Perform Temporal integral
6. Perform NetCDF packing
7. Archive

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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## INPUT

```
<work>/HIRS1b/nXX/yyyy - HIRS OLR level1b data for POES n$XX year $yyyy, XX=05, 06,
...20.
```

## OUTPUT

```
<work>/CDR/OLR_CDR/daily_olr_v${version}r${rev}_${yyyy1}${mm1}_${yyyy2}${mm2}.nc -
HIRS Daily OLR CDR Product file
```

## HISTORY

```
2013-09-12  Hai-Tien Lee Modified from Monthly production script for Daily OLR
production
2014-06-01  Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 34. Daily OLR CDR/OLR\_daily\_integral.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_daily\_integral.sh**

## PURPOSE

Giving the hourly maps from the available satellites,  
perform daily mean integral with the blending processes.

## DESCRIPTION

This script performs the blending and integral processes.

## USAGE

```
OLR_integral_integral.sh $yyyy $mm $dd $intersat_ver
```

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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Language: Bourne shell

## INPUT

```
$work/Daily/OLR_Daily_mean_<satid>_<yyyy><mm>.dat - Daily mean OLR for a given
satellite
$src/Data_static/coef_diurnal_model.dat
$src/Data_static/Intersat_Adjustment_Ed2.4.dat
```

## OUTPUT

```
$work/OLR_CDR/OLR_Daily_mean.<yyyy><mm>.dat
```

## HISTORY

```
2011-03-07      Hai-Tien Lee.
2013-03-21      Hai-Tien Lee. Pass intersat calibration version from calling program.
2014-06-01      Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 35. Daily OLR CDR/OLR\_gridder2b.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

```
OLR_gridder2b.sh
```

## USAGE

```
OLR_gridder.sh  $satid $yyyy $mm $dd $yday
```

## PURPOSE

```
Grid the OLR retrievals at fov to 1x1 hourly maps
OLR fov retrieval files are scanned and passed to grid\_olr\_1deg\_hrly.f90 for each
satellite
```

## DESCRIPTION

```
This script performs 1x1 deg hourly maps gridding
```

## AUTHOR

```
Hai-Tien Lee
```

## COPYRIGHT

```
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THE USE OF THE SOFTWARE AND DOCUMENTATION; OR (2) TO PROVIDE TECHNICAL
SUPPORT TO USERS.
```

Language: Bourne shell

## INPUT

<work>/OLR\_fov/<satid>/<yyyy>/ - OLR retrievals swath file (ie., at FOV level)

## OUTPUT

<work>/Hourly/OLR\_hourly\_mean\_<satid>\_<yyyy><ddd>.dat - Hourly mean OLR for a given  
satellite  
<work>/Hourly/ECT\_hourly\_mean\_<satid>\_<yyyy><ddd>.dat - Hourly mean ECT for a given  
satellite

## HISTORY

2013-09-12 Hai-Tien Lee.  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

# 36. Daily OLR CDR/OLR\_gridder\_v2a.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_gridder\_v2a.sh**

## USAGE

**OLR\_gridder\_v2a.sh** \$satid \$yyyy \$mm \$dd \$yday

## PURPOSE

Grid the OLR retrievals at fov to 1x1 orbit nodal maps  
OLR fov retrieval files are scanned and passed to [grid\\_olr\\_ldeg\\_nodal.f90](#) for each  
satellite

## DESCRIPTION

This script performs 1x1 deg orbital maps gridding

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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Language: Bourne shell

## INPUT

```
<work>/OLR_fov/<satid>/<yyyy>/ - OLR retrievals swath file (ie., at FOV level)
```

## OUTPUT

```
<work>/Nodal/OLR_nodal_mean_<satid>_<yyyy><ddd>.dat - Nodal mean OLR for a given
satellite
<work>/Nodal/ECT_nodal_mean_<satid>_<yyyy><ddd>.dat - Nodal mean ECT for a given
satellite
```

## HISTORY

```
2013-09-25      Hai-Tien Lee.
2014-06-01      Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 37. Daily OLR CDR/OLR\_packer\_annual.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_packer\_annual.sh**

## USAGE

```
OLR_packer_annual.sh $yyyy $version $revision
```

## PURPOSE

```
NetCDF-4 Packer script
Pack annual OLR CDR data into a NetCDF4 data file.
```

## DESCRIPTION

```
This script performs netCDF file packing for annual CDR product file
```

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

```
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SUPPORT TO USERS.
```

## INPUT

```
$yyyy=year of the OLR CDR time series (e.g. 1979)
$version=OLR CDR Product Version number
$revision=OLR CDR Product Revision number
<work>/Daily/$yyyy/OLR_daily_${yyyy}d${ddd}.dat - HIRS OLR CDR data in binary format
```

## OUTPUT

```
<work>/OLR_CDR/OLR_CDR_${yyyy}_vxxrxx.nc - HIRS OLR CDR Product file
```

## HISTORY

```
2013-12-18  Hai-Tien Lee Created for Daily OLR CDR
2014-01-28  Hai-Tien Lee modified for packing Daily OLR CDR for a year
2014-06-01  Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 38. Daily OLR CDR/OLR\_packer\_batch.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_packer\_batch.sh**

## USAGE

```
OLR_packer_batch.sh $yyyymmdd1 $yyyymmdd2 $version $revision
```

## PURPOSE

```
NetCDF-4 Packer script
Pack all available OLR CDR data into a NetCDF4 data file.
```

## DESCRIPTION

```
This script performs netCDF file packing for daily CDR product file
```

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

```
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THE USE OF THE SOFTWARE AND DOCUMENTATION; OR (2) TO PROVIDE TECHNICAL
SUPPORT TO USERS.
```

## INPUT

```
1979)          $yyyyymmdd1=beginning day of the OLR CDR time series (e.g. 19790101 for Jan 1,
2012)          $yyyyymmdd2=ending day of the OLR CDR time series (e.g. 20121231 for Dec 31,
                $version=OLR CDR Product Version number
                $revision=OLR CDR Product Revision number
<work>/OLR_CDR/archive_ascii/OLR_CDR_$yyyyymmdd1-$yyyyymmdd2.asc  - HIRS OLR CDR data in
ascii format
```

## OUTPUT

```
<work>/OLR_CDR/OLR_CDR_$yyyyymmdd1-$yyyyymmdd2_vxxrxx.nc - HIRS OLR CDR Product file
```

## HISTORY

```
2013-12-18  Hai-Tien Lee Created for Daily OLR CDR
2014-06-01  Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 39. Daily OLR CDR/OLR\_retrieval.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_retrieval.f90**

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=15, 16, ...,20

## PURPOSE

Performs HIRS radiance calibration and OLR retrieval

## DESCRIPTION

This program reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998) and perform OLR retrieval using Ellingson et al. (1989, 1994) method.

## AUTHOR

Hai-Tien Lee

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SUPPORT TO USERS.

EXTERNALS

```
DEPENDENCIES
swapbyte.f90
read_instru para.f90
rdhdr.f90
read_hirslb.f90
get_hirs.f90
calc_olr.f90
```

INPUTS

OUTPUTS

HISTORY

2003-01-01	Original Code (atovmain.f) obtained from L. McMillin
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

40. Daily OLR CDR/OLR\_retrieval.sh [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

```
OLR_retrieval.sh
```

USAGE

```
OLR_retrieval.sh <satid> <yyyy> <mm> <yday_beginning> <yday_ending>
where <satid> is 3-letter satllite code (n05, n06, n07, ..., n20),
<yyyy> is 4-digit year, <mm> is 2-digit month (01, 02, ..., 12),
<yday_beginning> and <yday_ending> are 3-digit days of the year for the beginning
and ending of the given month.
```

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.
```

DESCRIPTION

This script performs OLR retrievals from HIRS instruments

AUTHOR

Hai-Tien Lee

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## INPUT

```
<work>/data_lb/<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

```
<work>/OLR_fov/<satid>/<yyyy>/<mm> - OLR retrievals swath file (ie., at FOV level)
```

## HISTORY

```
2010-11-26      Hai-Tien Lee. Modified from run19.com for HIRS OLR CDR Production
2011-03-27      Hai-Tien Lee - change source file ${satid}_pred_cali.dat to a
universal name   pred_cali_oper.dat.
                 "pred_cali_oper.dat" is prepared by script define\_pred\_version.sh.
2011-03-30      Hai-Tien Lee - Add switch of OLR_retrieval programs to handle
Level1b         format change for N11 and N12 in 1995
input to        2013-09-12  Hai-Tien Lee - Add yday_target (as $5 argument) and use terminal
to include last 2 files from          pass to hirsrad2.f90. Construct datalb_list
                 previous day.
2014-06-01      Hai-Tien Lee for NCDC Daily OLR CDR Production
```

## 41. Daily OLR CDR/OLR\_retrieval\_Gridsat.sh [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**OLR\_retrieval\_Gridsat.sh**

### USAGE

```
OLR_retrieval_Gridsat.sh <yyyy> <mm> <dd> <yday>
where <yyyy> is 4-digit year, <yday> is 3-digit days of the year
```

### PURPOSE

Retrieval Imager OLR at each 1x1 grid box using Gridsat brightness temperature data

### DESCRIPTION

This script performs Imager OLR retrievals using Gridsat brightness temperature data

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## INPUT

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

## OUTPUT

<work>/OLR\_Gridsat/<yyyy>/<mm> - 1x1 3hrly Imager OLR

## HISTORY

2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 42. Daily OLR CDR/OLR\_retrieval\_GSIP.sh [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**OLR\_retrieval\_GSIP.sh**

## USAGE

**OLR\_retrieval\_GSIP.sh** <yyyy> <mm> <dd> <yday>  
where <yyyy> is 4-digit year, <yday> is 3-digit days of the year

## PURPOSE

Extract Imager OLR from GSIP product

## DESCRIPTION

This script extract and grid Imager OLR into 1x1 3hrly map

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## INPUT

```
<work>/Gridsat/<satid>/<yyyy>/ - Gridsat CDR
```

## OUTPUT

```
<work>/OLR_Gridsat/<yyyy>/<mm> - 1x1 3hrly Imager OLR
```

## HISTORY

2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 43. Daily OLR CDR/phys\_const.cmn.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

### NAME

**phys\_const.cmn.f90**

### LOCATION

Codes/OLR\_retrieval/Nxx/, xx=05,06,07,08,09,10,11,12,14

### PURPOSE

Declaration for physical constants

### DESCRIPTION

Commonly used physical constants to be INCLUDED by other programs.

### AUTHOR

Hai-Tien Lee

## COPYRIGHT

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

44. Daily OLR CDR/phys\_const.cmn.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

phys\_const.cmn.f90

LOCATION

Codes/OLR\_retrieval/Nxx/phys\_const.cmn.f, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Declaration for physical constants

DESCRIPTION

Commonly used physical constants to be INCLUDED by other programs.

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

45. Daily OLR CDR/rdhdr.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

NAME

`rdhdr.f90`

LOCATION

`Codes/OLR_retrieval/Nxx, xx=05,06,...,14`

PURPOSE

`Read header info from HIRS level-1b data`

DESCRIPTION

`This F90 subroutine reads header info in HIRS Level-1b data.`

AUTHOR

`Hai-Tien Lee`

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EXTERNALS

DEPENDENCIES  
[swap.f90](#)

## INPUTS

hdbuf - one header record of HIRS level 1b data read in from file unit 'in'.

## OUTPUTS

stid - satellite id  
idttp -  
numscan - number of scan lines in this orbit file  
numrec - number of record in this orbit file  
starty - beginning year  
startd - beginning day of the year  
startt - beginning time of the day (seconds)  
endt - ending time of the day

## HISTORY

2003-01-01 Original Code (atovmain.f) obtained from L. McMillin  
2013-03-30 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## 46. Daily OLR CDR/rdhdr.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**rdhdr.f90**

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=15,16,...,21

## PURPOSE

Read header info from HIRS level-1b data

## DESCRIPTION

This F90 subroutine reads header info in HIRS Level-1b data.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[swapbyte.f90](#)  
[swapwd.f90](#)

## INPUTS

hdbuf - one header record of HIRS level 1b data read in from file unit 'in'.

## OUTPUTS

stid - satellite id  
idttp -  
numscan - number of scan lines in this orbit file  
numrec - number of record in this orbit file  
starty - beginning year  
startd - beginning day of the year  
startt - beginning time of the day (seconds)  
endt - ending time of the day

## HISTORY

2003-01-01	Original Code (atovmain.f) obtained from L. McMillin
2003-08-26	Hai-Tien Lee for NOAA-KLM
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 47. Daily OLR CDR/rdhdr\_1995.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

## NAME

**rdhdr\_1995.f90**

## LOCATION

Codes/OLR\_retrieval/Nxx, xx=11,12,14

## PURPOSE

Read header info from HIRS level-1b data

## DESCRIPTION

This F90 subroutine reads header info in HIRS Level-1b data.

## AUTHOR

Hai-Tien Lee

# COPYRIGHT

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# EXTERNALS

DEPENDENCIES  
[swap.f90](#)

# INPUTS

hdbuf - one header record of HIRS level 1b data read in from file unit 'in'.

# OUTPUTS

stid - satellite id  
idttp -  
numscan - number of scan lines in this orbit file  
numrec - number of record in this orbit file  
starty - beginning year  
startd - beginning day of the year  
startt - beginning time of the day (seconds)  
endt - ending time of the day

# HISTORY

2003-01-01	Original Code (atovmain.f) obtained from L. McMillin
2013-03-30	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 48. Daily OLR CDR/read\_hirs1b.f90 [ Programs ]

[ [Top](#) ] [ Programs ]

# NAME

**read\_hirs1b.f90**

# LOCATION

Codes/OLR\_retrieval/Nxx, xx=15,16,...,21

# PURPOSE

Read in HIRS level-1b data into structure variable

## DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[type\\_def.f90](#)

## INPUTS

n - direct access record number to be read in  
filename - HIRS level-1b data file name

## OUTPUTS

hirs1b\_d(struc\_1b) - A structure variable containing HIRS level-1b data  
nerror - error code for read error

## HISTORY

2009-01-01	Junsuk Lee created to bypass Intel Fortran limitation that structure variable cannot be endian swapped unless it is read in as flattened fashion.
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 49. Daily OLR CDR/read\_instru\_para.f90 [ Programs ]

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## NAME

`read_instru_para.f90`

## LOCATION

Codes/OLR\_retrieval/Nxx/, xx=05,06,07,08,09,10,11,12,14

## PURPOSE

Performs HIRS radiance calibration

## DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[instrument.cmn.f90](#)

## INPUTS

pred\_cali.txt - Static data file containing predicting coefficients for temperature-dependent interpolation for calibration coefficients  
prt.txt - Coefficients to derive temperatures for PRT sensors  
band.txt - band parameters, for apparent to effective brightness temperature conversion  
Note that these three file names are hard coded. They are created as symbolic links in the calling script.

## OUTPUTS

## HISTORY

2009-01-01	Junsuk Lee modified for NOAA-KLM level-1b data format
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 50. Daily OLR CDR/read\_instru\_para\_HIRS3.f90 [ Programs ]

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## NAME

`read_instru_para_HIRS3.f90`

## LOCATION

Codes/OLR\_retrieval/Nxx/, xx=15,16,17

## PURPOSE

Performs HIRS radiance calibration

## DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[instrument.cmn.f90](#)

## INPUTS

pred\_cali.txt - Static data file containing predicting coefficients for temperature-dependent interpolation for calibration coefficients  
prt.txt - Coefficients to derive temperatures for PRT sensors  
band.txt - band parameters, for apparent to effective brightness temperature conversion  
Note that these three file names are hard coded. They are created as symbolic links in the calling script.

## OUTPUTS

## HISTORY

2009-01-01	Junsuk Lee modified for NOAA-KLM level-1b data format
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

# 51. Daily OLR CDR/read\_instru\_para\_HIRS4.f90 [ Programs ]

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## NAME

`read_instru_para_HIRS4.f90`

## LOCATION

Codes/OLR\_retrieval/Nxx/, xx=18,19,20

## PURPOSE

Performs HIRS radiance calibration

## DESCRIPTION

This F90 subroutine reads in HIRS Level-1b data, performs HIRS radiance calibration using McMillin method (NOAA POES Users Guide, 1998).

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES  
[instrument.cmn.f90](#)

## INPUTS

pred\_cali.txt - Static data file containing predicting coefficients for temperature-dependent interpolation for calibration coefficients  
prt.txt - Coefficients to derive temperatures for PRT sensors  
band.txt - band parameters, for apparent to effective brightness temperature conversion  
Note that these three file names are hard coded. They are created as symbolic links in the calling script.

## OUTPUTS

## HISTORY

2009-01-01	Junsuk Lee modified for NOAA-KLM level-1b data format
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

52. Daily OLR CDR/superdata.cmn.f90 [ Programs ]

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NAME

superdata.cmn.f90

LOCATION

Codes/OLR\_retrieval/Nxx/, xx=15,16,...,21

PURPOSE

Declaration for superdata common block and its variables

DESCRIPTION

I/O variables used HIRS radiance calibration are defined here and passed as superdata common block

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 53. Daily OLR CDR/superdata.cmn.f90 [ Programs ]

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### NAME

`superdata.cmn.f90`

### LOCATION

`Codes/OLR_retrieval/Nxx/, xx=05,06,...,14`

### PURPOSE

Declaration for superdata common block and its variables

### DESCRIPTION

I/O variables used HIRS radiance calibration are defined here and passed as superdata common block

### AUTHOR

Hai-Tien Lee

### COPYRIGHT

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### EXTERNALS

DEPENDENCIES

### INPUTS

### OUTPUTS

### HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

## 54. Daily OLR CDR/swap.f90 [ Programs ]

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NAME

swap.f90

LOCATION

Codes/OLR\_retrieval/Nxx, xx=05,06,07,08,09,10,11,12,14

PURPOSE

Byte swapping for xbuf character array

DESCRIPTION

Byte swapping for xbuf character array. This swap is needed when running on a little-endian machine.

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2003-08-01	Hai-Tien Lee Created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

55. Daily OLR CDR/swap\_1995.f90 [ Programs ]

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NAME

swap\_1995.f90

LOCATION

Codes/OLR\_retrieval/Nxx, xx=11,12,14

PURPOSE

Perform byte swap

DESCRIPTION

This F90 subroutine is used by hdhdr\_1995.f90 for byte swapping

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

xbuf - one header record of HIRS level 1b.

OUTPUTS

byte swapped array returned to xbuf

HISTORY

2013-03-30 Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01 Hai-Tien Lee for NCDC Daily OLR CDR Production

## NAME

`swapbyte.f90`

## LOCATION

`Codes/OLR_retrieval/Nxx, xx=15,16,...,21`

## PURPOSE

Performs byte swapping for a two-byte word variable

## DESCRIPTION

This F90 subroutine swap the byte order of a two-byte word variable.

## AUTHOR

Hai-Tien Lee

## COPYRIGHT

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## EXTERNALS

DEPENDENCIES

## INPUTS

`wd` - a two-byte word

## OUTPUTS

`wd` - the two-byte word that is byte-swapped

## HISTORY

2003-08-26	Hai-Tien Lee created
2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production

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NAME

swapwd.f90

LOCATION

Codes/OLR\_retrieval/Nxx/, xx=15,16,...,21

PURPOSE

Performs swapping of two words

DESCRIPTION

This F90 subroutine swaps two given word variables.

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

wd1, wd2 - two two-byte word variables

OUTPUTS

wd1, wd2 - two two-byte words whose content is swapped

HISTORY

2003-08-26    Hai-Tien Lee created  
2010-11-26    Hai-Tien Lee for NCDC HIRS OLR CDR Production  
2014-06-01    Hai-Tien Lee for NCDC Daily OLR CDR Production

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NAME

`type_def.f90`

LOCATION

`Codes/OLR_retrieval/Nxx/, xx=15,16,...,21`

PURPOSE

Define the structure of the Hirs leve-1b data

DESCRIPTION

This F90 module defines HIRS level-1b data as a structure. Structure definition is satellite-dependent and time dependent (as format changes).

AUTHOR

Hai-Tien Lee

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EXTERNALS

DEPENDENCIES

INPUTS

OUTPUTS

HISTORY

2010-11-26	Hai-Tien Lee for NCDC HIRS OLR CDR Production
2014-06-01	Hai-Tien Lee for NCDC Daily OLR CDR Production