Installation using the PATMOS-x/CLAVR-x Source Code tarball

The following describes how and what is needed to install/run PATMOS-x/CLAVR-x on your machine using the tarball on the CIMSS FTP server. There are two parts to the PATMOS-x/CLAVR-x v5 delivery. This is because the PATMOS-x/CLAVR-x has the main source as well as a converter used to convert the GFS GRIB/GRIB2 files to the HDF files used by PATMOS-x/CLAVR-x

PLEASE READ: IMPORTANT!

- **The HDF4 libraries are required for PATMOS-x/CLAVR-x. Please install them on your computer with the compiler you plan on using**
- **All source and example default and file list files are located in the tarball: clavrx_src_08_17_2010.tar**
- **All ancillary data needed, except the OISST and NCEP data, are in the tarball: clavrx_ancil_data_08_17_2010.tar.bz2**
- **CLAVR-x can be compiled using gfortran, ifort and AIX (please email for AIX compiler information)**

PATMOS-x/CLAVR-x Code

PATMOS-x/CLAVR-x CODE TARBALL LOCATION:

http://www.ncdc.noaa.gov/thredds/catalog/

grib2hdf converter

If you plan on using the GFS files and your NWP, please follow these instructions to compile the grib2hdf converter

1. You will need wgrib and wgrib2 installed on your machine (not provided)
2. The source code for the grib2hdf converter is located under./clavrx/grib2hdf/ in the tarball.
3. You will need to edit the compile script (./clavrx/grib2hdf/compile.sh) with the location of the HDF4 libraries in compile.sh
4. Type **convert_grib_hdf -help** for instructions

PATMOS-x/CLAVR-x Executable

1. The source code is located under ./clavrx/src/ in the tarball
   - A. You will need to run the configure.sh command with the location of the hdf libraries.
     1. Run ./configure --help to display usage
     2. Example run: ./configure --with-ifort -hdflib=/opt/hdf4/lib/
   - B. Once you have run the configure script, simply type **make** in the source directory.
2. The clavrxorb, comp_time, comp_asc_des executables are located in level up from the source directory
3. To run clavrx, simply type **clavrxorb** in the ./clavrx/ folder.
4. **clavrxorb -help** provides a list of help for CLAVR-x
5. **The clavrxorb_default_file is as follows.**
   - A. **./clavrxorb/ contains an example default file: clavrxorb_default_options**
   - B. **The following is a list of what is on each line of the clavrxorb_default_options file**
     1. use or not use: 1b reflectance calibration (0 = not use, 1 = use. 0 is recommended)
     2. use or not use: 1b thermal calibration (0 = not use, 1 = use. 0 is recommended)
     3. fill in or do not fill in clavr-x bytes in level 1b (0 = not fill in, 1 = fill in. 0 is recommended)
     4. What navigation to use (0=level-1b,1 = clevernav. 0 is recommended)
     5. Write nav file (0=no,1=make output file)
     6. Write CMR file (0=no,1=make output file)
     7. Write obs file (0=no,1=make output file)
     8. Write geo file   (0=no,1=make output file)
     9. Write cld file   (0=no,1=make output file)
     10. Write sst file   (0=no,1=make output file)
     11. Write rtm file   (0=no,1=make output file)
     12. Write Vol ash file   (0=no,1=make output file)
     13. Write level 2 file (0=no,1=make output file)
     14. Write level 3 file   (1 = make gridded output)
     15. Use cloud mask from 1b (1 = read from 1b and don't recompute. 0 is recommended)
     16. Use baysen cloud mask (0=no, 1 = yes. 0 is recommended)
     17. Process sst products (0= no, 1 = yes)
     18. Process cld products (0= no, 1 = yes)
     19. Process aerosol products (0= no, 1 = yes)
     20. Process earth radiation budget products (0= no, 1 = yes)
     21. Process volcanic ash products (0= no, 1 = yes. 0 is recommended)
     22. Use oisst data (0 = No, 1 = yes. 1 is recommended)
     23. Which OISST file to use (0 = determine file, 1 = use oisst.current. 0 is recommended)
     24. Level 3 grid resolution (0.25, 0.5 or 1.0 degree)

25. Level 3 grid format: eq. area (0) / eq. angle (1)

26. Output file compression (0=no,1=gzip,2=szip)

27. Subset pixel hdf (0=no, 1= yes. 0 is recommended)

28. Which NWP to use   (0=none, 1=gfs,2=ncep reanalysis)

29. Which RTM to use   (0=crtm,1=pfast. PFAAST currently only available)

30. Use MODIS clear ref ancillary data (0=no,1=yes. 1 is recommended)

31. Use Probably clear restoral (0=no,1=yes)

32. Use Local Radiative Centers (0=no,1=yes)

33. Process undetected clouds for L2 products (0=no,1=yes. 0 is recommended)

34. Output diagnostic output (0=no,1=yes. 0 is recommended)

35. Which node for diagnostic output (0=asc,1=des)

36. Minimum latitude for diagnostic output

37. Maximum latitude for diagnostic output

38. Ancillary data directory

39. GFS HDF directory

40. NCEP reanalysis directory

41. OISST directory

42. Snow mask directory (if used)

43. Smooth nwp (0=no, 1 = yes)

44. Use SEEBOR Emissivity (0=no, 1 = yes. 1 is recommended)

45. Read hires sfc type (0=no-8km, 1 = yes-1km. 1 is recommended)

46. Read land mask (0=no, 1 = yes. 1 is recommended)

47. Read coast mask (0=no, 1 = yes. 1 is recommended)

48. Read surface elevation (0=no, 1 = yes. 1 is recommended)

49. Read volcano mask (0=no, 1 = yes. 0 is recommended)

50. minimum and maximum solar zenith angle limits

51. Read snow mask (0=no, 1 = yes)

C. **You will need to specify the locations of the various ancillary data (next section) for your machine in the default file.**

6. **The following is the list of what is on each line of the clavrxorb_file_list file** (an example file list is located in the ./clavrx/ directory)

A. Level 1b directory location

B. L1bx file directory

C. clevernav input file

D. output directory for navigation output

E. output directory for cmr output

F. output directory for sst output

G. output directory for cld output

H. output directory for obs output

I. output directory for geo output

J. output directory for rtm output

K. output directory for ash output

L. output directory for level2 output

M. output directory for level3 output

N. Level 1b file names (separate line for each file name**)**

7. **You can get the NOAA L1b data from CLASS**

PATMOS-x/CLAVR-x Ancillary data

PATMOS-x/CLAVR-x ANCILLARY DATA TARBALL LOCATION:
http://www.ncdc.noaa.gov/thredds/catalog/

1. The CLAVR-x ancillary data requires at least 10GB of hard drive space

2. Download **http://www.ncdc.noaa.gov/thredds/catalog/** to the location you wish to store the ancillary data

3. Bunzip2 the file

4. Untar clavrx_ancil_data.tar. This will untar to clavrx_ancil_data, which contains all the folders and data for the CLAVR-x ancillary data

5. Change to the ./clavrx_ancil_data/bayes/ . **PLEASE READ CLOSELY**

    A. Softlink (ln -s) naive_bayes_ir_only_avhrr_phase.txt, located in the clavrx/src folder, to this directory

    B. **If you are using GFS:** Softlink naive_bayes_ir_only_avhrr_mask_gfs.txt to naive_bayes_ir_only_avhrr_mask.txt, located in the clavrx/src folder, to this directory. This is done by the following command.

        ▪ (in the /clavrx_ancil_data/bayes/ directory) ln -s (clavrx source directory)/naive_bayes_ir_only_avhrr_mask_gfs.txt naive_bayes_ir_only_avhrr_mask.txt

    C. **If you are using the NCEP reanalysis:** Softlink naive_bayes_ir_only_avhrr_mask_ncep.txt to naive_bayes_ir_only_avhrr_mask.txt, located in the clavrx/src folder, to this directory. This is done by the following command.

        ▪ (in the /clavrx_ancil_data/bayes/ directory) ln -s (clavrx source directory)/naive_bayes_ir_only_avhrr_mask_ncep.txt naive_bayes_ir_only_avhrr_mask.txt

6. Change to the ./clavrx_ancil_data/sfc_data/ directory and bunzip2 all *.bz2 files

7. Change to the ./clavrx_ancil_data/luts/cld/ directory and bunzip2 all *.bz2 files

8. **NCEP reanalysis**

   A. Go to NCEP and download the yearly reanalysis files. This is available at ftp.cdc.noaa.gov.

   B. Place the following files in the location you are storing the NCEP reanalysis data (yyyy is the 4 number year, ex. 2010)

      1. Under Datasets/ncep.reanalysis/pressure/ you need the air.yyyy.nc, hgt.yyyy.nc, rhum.yyyy.nc files

      2. Under Datasets/ncep.reanalysis/surface/ you need get the rhum.sig995.yyyy.nc, air.sig995.yyyy.nc, pr_wtr.eatm.yyyy.nc, pres.sfc.yyyy.nc files.

      3. Under Datasets/ncep.reanalysis/surface_gauss/ you need get the uwnd.10m.gauss.yyyy.nc, vwnd.10m.gauss.yyyy.nc, weasd.sfc.gauss.yyyy.nc, skt.sfc.gauss.yyyy.nc files

      4. Under the Datasets/ncep.reanalysis/tropopause/ you need get the air.tropp.yyyy.nc, pres.tropp.yyyy.nc files

   C. Copy the top level folder location in your clavrxorb_default_options (line 40)

9. **OISST 25 km data**

   A. The OISST folder needs to be organized by year. (ex. ./oisst_daily/1999/ contains all the 1999 OISST files)

   B. The OISST files are located on the eclipse.ncdc.noaa.gov FTP server under pub/OI-daily-v2/IEEE/yyyy/AVHRR, where yyyy is the 4 number year (ex. 1999)

   C. **Do NOT gunzip these files.**

   D. Copy the top level folder in your clavrxorb_default_options (line 41)

10. **GFS data**

    A. NOMADS (http://nomads.ncdc.noaa.gov/) can be used to down load historical GFS data.

    B. You will need to use the grib2hdf converter to convert from the GRIB/GRIB2 format to the HDF file used by CLAVR-x.

    C. Be sure that you order ALL levels for the entire domain

    D. CLAVR-x uses the 12 hour forecasts

For additional information about PATMOS-X see: http://cimss.ssec.wisc.edu/patmosx/