CGMS-39, CMA-WP-16
Prepared by CMA
Agenda Item: G.IV/2
Discussed in WG-IV

Pre-processing Package for FY-3 Polar-orbiting Satellites

Summary of the Working Paper.

This paper informs the CGMS that the NSMC/CMA released two software packages, FY3L0pp V1.0 and FY3L1pp V1.0, to help FY-3A/B DB users processing t X-band MPT data (MERSI instrument) and L-band HRPT data (all instruments but MERSI), which are packed into CCSDS format. At present, the two software packages are capable of processing raw data of 4 instruments: MERSI, VIRR, MWTS and MWHS onboard the FY-3A/B. Users shall obtain the package and ancillary data by sending request and approved by CMA (Fax: +86-10-62172727).

Pre-processing Package for FY-3 Polar-orbiting Satellites

1. Introduction

FY-3A/B broadcasts X-band MPT data (MERSI instrument) and L-band HRPT data (all instruments but MERSI), which are packed into CCSDS format. To assist DB users in processing the FY-3 data (HRPT and MPT), the NSMC/CMA released two software packages, FY3L0pp V1.0 and FY3L1pp V1.0, for Linux users. At present, the two software packages are capable of processing raw data of 4 instruments: MERSI, VIRR, MWTS and MWHS. Users shall obtain the package and ancillary data by sending request and approved by CMA (Fax: +86-10-62172727).

2. Operating Environment of FY3L0pp V1.0 and FY3L1pp V1.0

FY3L0pp V1.0 and FY3L1pp V1.0 can successfully run on the following operating system:

- RedHat Fedora Linux 6.0
- RedHat Fedora Linux 8.0
- RedHat Fedora Linux 10.0

Recommended hardware configurations:

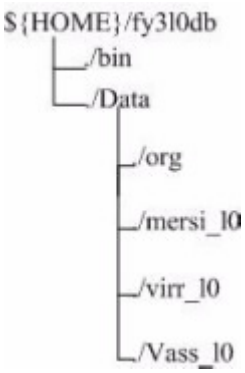
- CPU: Intel Pentium Duo Core processor (>3.0GHz)
- RAM: >2GB
- Harddisk: >200GB

3. FY-3 MPT/HRPT Level-0 data generation software package (FY3L0pp V1.0)

The main function of FY3L0pp package is unpacking the X-band and L-band raw data to generate the level-0 data.

3.1 Architecture of FY3L0pp V1.0

After being installed, the system automatically creates the following directory structure under user directory:



The details of directory are described in the following table.

Directory	Description
fy3l0db	Home directory of FY3L0pp software package
Bin	Repository directory of execution codes
Data	level-0 data repository directory of each instrument
Org	Repository directory of raw data
mersi_l0	repository directory of unpacked level-0 data of MERSI
virr_l0	repository directory of unpacked level-0 data of VIRR
vass_l0	repository directory of unpacked level-0 data of VASS unit (MWTS, MWHS and IRAS)

3.2 Executable program of FY3L0pp V1.0

There are three execution scripts in /Bin directory, namely, Fy3MersiL0db.csh, Fy3VirrL0db.csh and Fy3VassL0db.csh. Function of these three execution scripts are described in the following table.

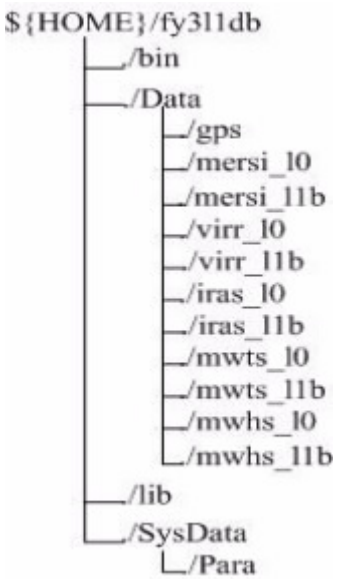
Scripts	Function
Fy3MersiL0db.csh	unpack X-band MPT raw data of MERSI to generate level-0 data
Fy3VirrL0db.csh	unpack L-band VIRR raw data to generate level-0 data;
Fy3VassL0db.csh	unpack L-band raw data of VSS unit (MWTS, MWHS) to generate level-0 data.

4. FY-3 MPT/HRPT Level-1 data generation software package (FY3L0pp V1.0)

The main function of FY3L1pp package is processing level-0 data of five instruments, MERSI, VIRR, MWTS, MWHT and IRAS, to generate the level-1 data for each.

4.1 Architecture of FY3L0pp V1.0

After being installed, the system automatically creates the following directory structure under user directory:



The details of directory are described in the following table.

Directory	Description
fy3l1db	Home directory of the FY3L1pp software package
bin	Repository directory for the executable code of the pretreated software package
data	Repository directory for level-0 and level-1 data from various payload instruments
gps	Repository directory for GPS data disseminated by FY-3
mersi_l0	Repository directory for unpacked level-0 data from MERSI
mersi_l1	Repository directory for preprocessed level-1 data from MERSI
virr_l0	Repository directory unpacked level-0 data from VIRR
virr_l1	Repository directory for preprocessed level-1 data from VIRR
iras_l0	Repository directory for unpacked level-0 data from IRAS
iras_l1	Repository directory for preprocessed level-1 data from IRAS
mwts_l0	Repository directory for unpacked level-0 data from MWTS
mwts_l1	Repository directory for preprocessed level-1 data from MWTS
mwhs_l0	Repository directory for unpacked level-0 data from MWHS
mwhs_l1	Repository directory for preprocessed level-1 data from MWHS
lib	Repository directory for the library files attached to FY3L1pp preprocessing software package
SysData	Repository directory for static data files necessary for FY3L1pp package, e.g. Land Mask file, Land Cover file, DEM, fy31line.dat, leapsec.dat and utcpole.dat.
Para	Repository directory for calibration coefficients of MERSI

4.2 Executable program of FY3L0pp V1.0

There are five execution scripts in /bin directory, namely, Fy3MersiL1db.csh, Fy3VirrL1db.csh, Fy3MwtsL1db.csh, Fy3MwhsL1db.csh, and Fy3IrasL1db.csh. Detailed function of these five execution scripts are described in the following table.

Scripts	Function
Fy3MersiL1db.csh	MERSI data processing routine
Fy3VirrL1db.csh	VIRR data processing routine
Fy3MwtsL1db.csh	MWTS data processing routine
Fy3MwhsL1db.csh	MWHS data processing routine
Fy3IrasL1db.csh	IRAS data processing routine

4.3 Ancillary data of FY3L0pp V1.0

While running the FY3L1pp, some static data files are required, which can be downloaded on Internet:

- fy3a1line.dat

  (http://www.nsmc.cma.gov.cn/NewSite/NSMC/Channels/100285.html/fy3a1line.dat) is downloaded and saved in the (./fy3l1db/SysData/) directory on a daily basis

- utcpole.dat

  (ftp://oceans.gsfc.nasa.gov/COMMON/utcpole.dat) is downloaded and saved in the (./fy3l1db/SysData/) directory on a weekly basis

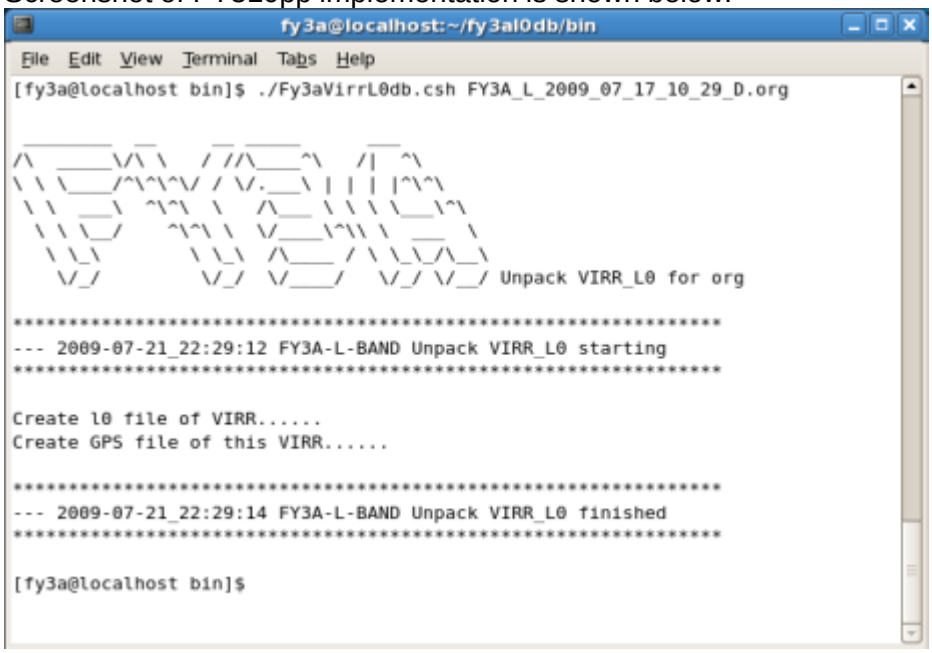
leapsec.dat

(ftp://oceans.gsfc.nasa.gov/COMMON/leapsec.dat) is downloaded and saved in the (./fy3l1db/SysData/) directory on a weekly basis

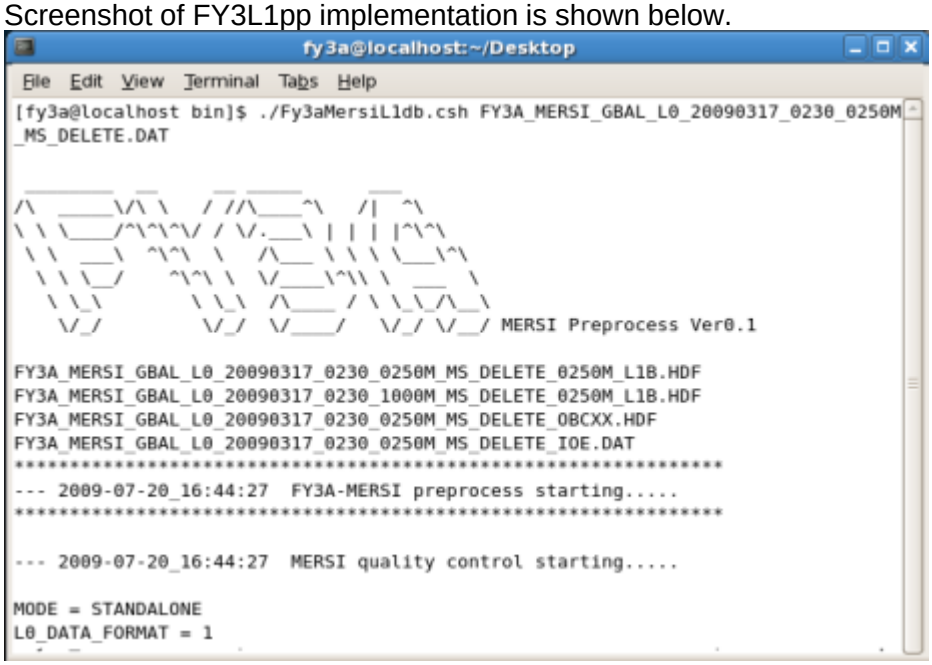
5. Software implementation and the result

5.1 Screenshot of Software implementation

Screenshot of FY3L0pp implementation is shown below.

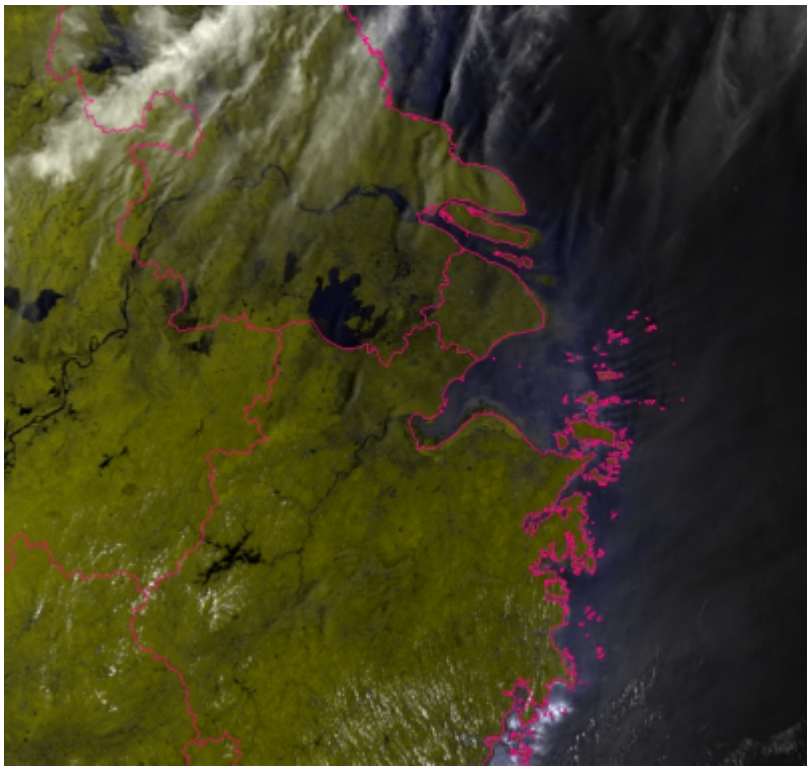


Screenshot of FY3L1pp implementation is shown below.



6.2 Screenshot of processing result

Outcome of FY3L1pp for VIRR(L1B data)



Outcome of FY3L1pp for MERSI(L1B data)