CMA/NSMC Satellite Data Assimilation Activities: Uses of ATOVS and Fengyun VASS Data in WRF

Lu Qifeng[1], Liu Zhiquan[1,2],Wu Xuebao[1], Zhang Peng[1], Lu Naimeng[1], Zhang Fengying[1], Ma gang[1], Yang jun[1], Dong Chaohua[1], Tang shihao[1], Dale Barker[2]

[1]National Satellite Meteorological Center, CMA
[2]NCAR/MMM
E-mail: luqf@cma.gov.cn, lqifeng@163.com

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Forecast/Assimilation System

WRF-V2 forecast model/WRF-3Dvar with following implementation

- RTTOV8.7 and CRTM for radiance assimilation

- Harris & Kelley Method for bias correction

- NMC Method for background covariance

- Modified land surface dataset for China surface complexity

- Improved physics for better depiction of surface snow

- Background error updated every 6 hour;

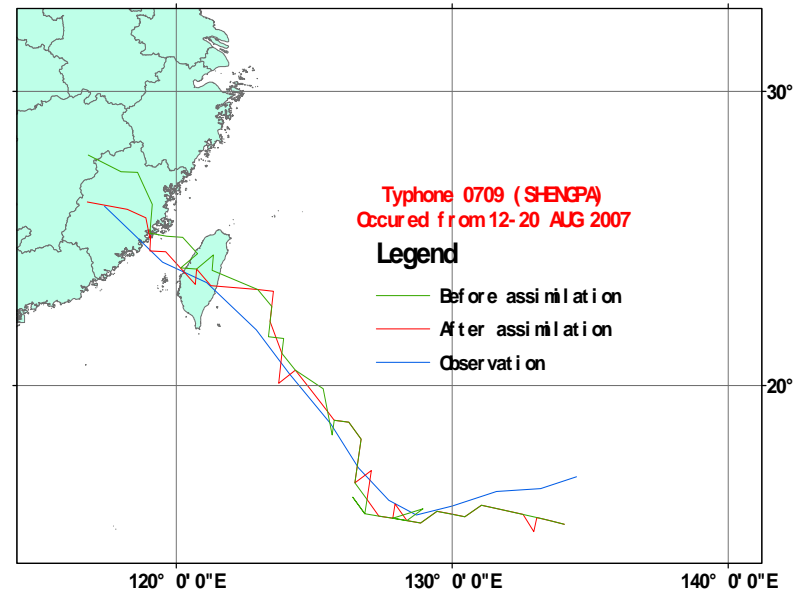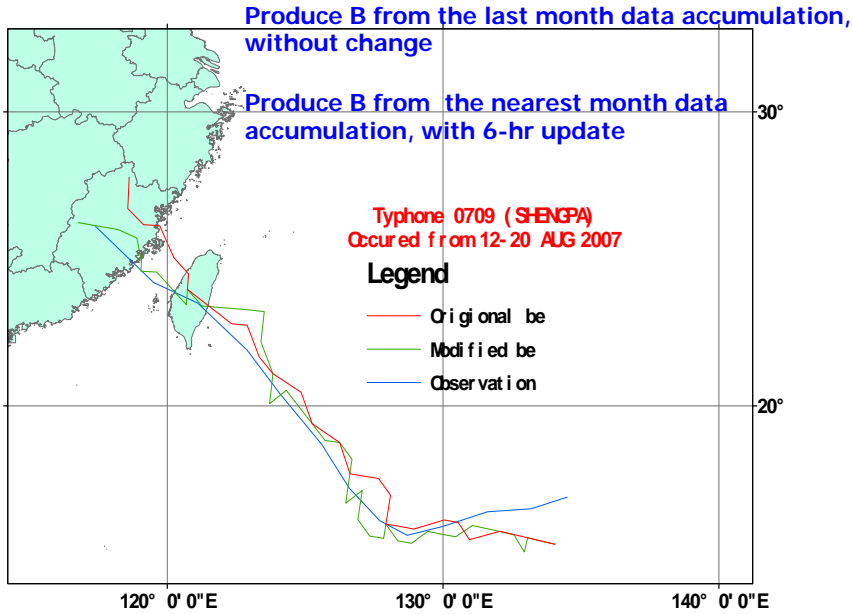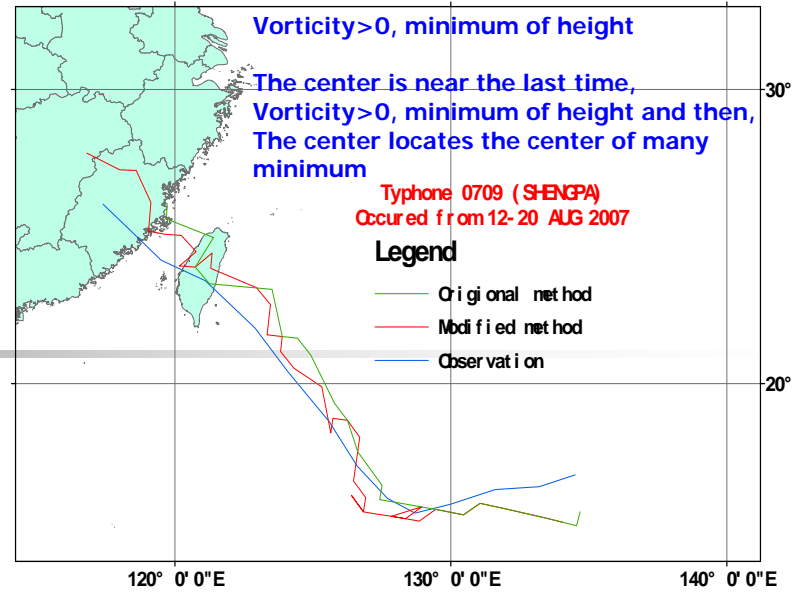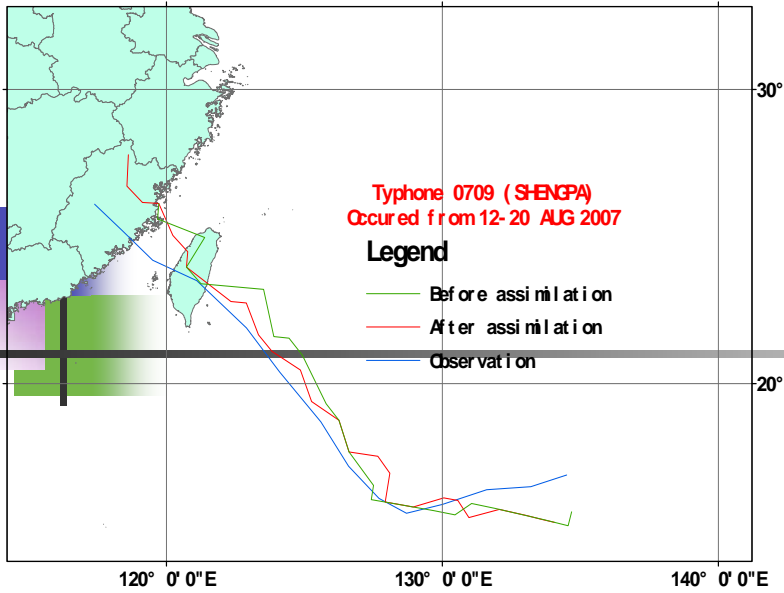# Satellite Data Assimilated and Planned for Uses in WRF-3dvar

- ATOVS data received, preprocessed by NSMC/CMA

- FY3/VASS instruments are added into WRF/3Dvar

- METOP/IASI instrument are added into WRF/3Dvar

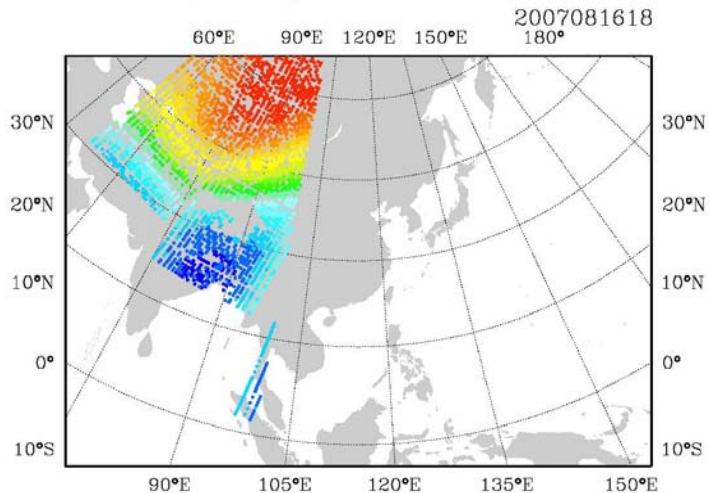# Forecast/Assimilation System and its Application in Typhoon Shenpa

- **Forced by NCEP GDAS dataset**

- **6-hour assimilation window**
-     00   06   12   18
-   21-03   03-09 09-15 15-21

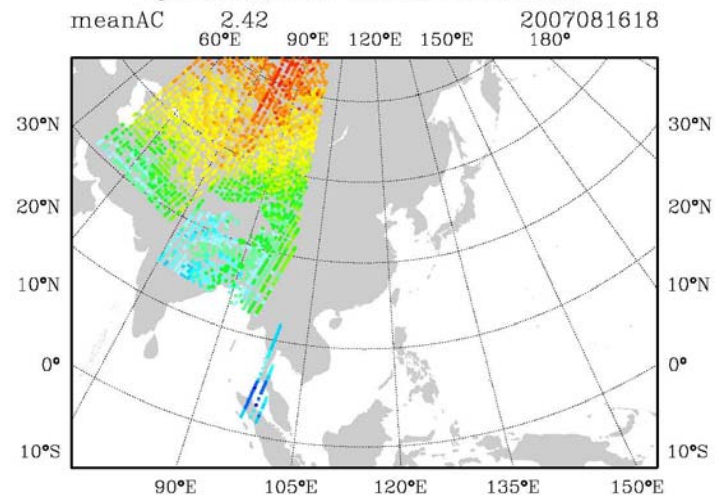- **Post-processed by NCAR-GRADS**

- **Now forced by T213 dataset**

Top-left panel:

Typhone 0709 (SHENGPA)
Occured from 12-20 AUG 2007

Legend

Before assimilation
After assimilation
Observation

Top-right panel:

Vorticity>0, minimum of height

The center is near the last time,
Vorticity>0, minimum of height and then,
The center locates the center of many
minimum

Typhone 0709 (SHENGPA)
Occured from 12-20 AUG 2007

Legend

Original method
Modified method
Observation

Bottom-left panel:

Produce B from the last month data accumulation,
without change

Produce B from the nearest month data
accumulation, with 6-hr update

Typhone 0709 (SHENGPA)
Occured from 12-20 AUG 2007

Legend

Original be
Modified be
Observation

Bottom-right panel:

Typhone 0709 (SHENGPA)
Occured from 12-20 AUG 2007

Legend

Before assimilation
After assimilation
Observation

FY3-VASS data assimilation and its related

SuperTY0709/18.7/125.6/518

Analyser:Zhounf
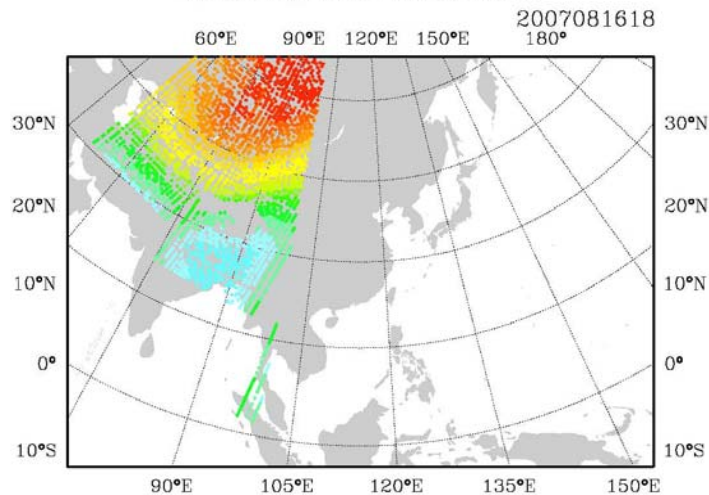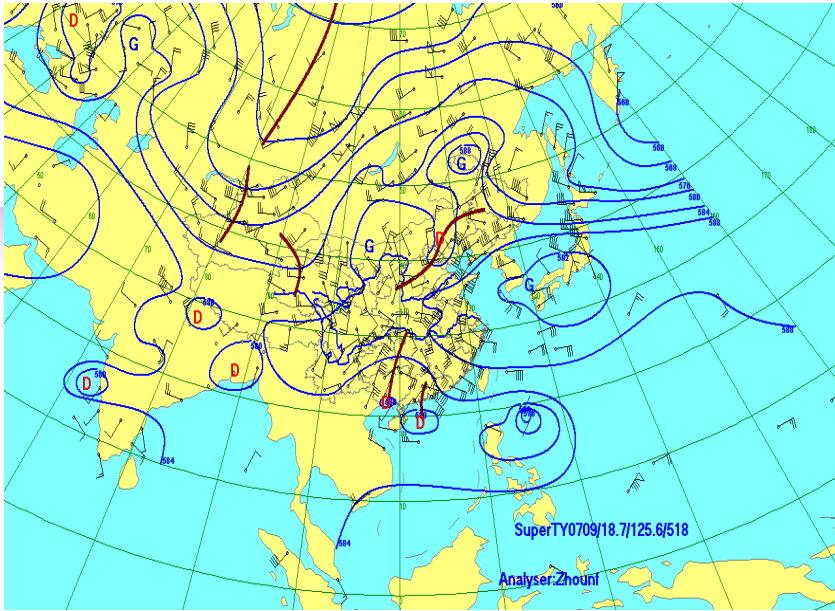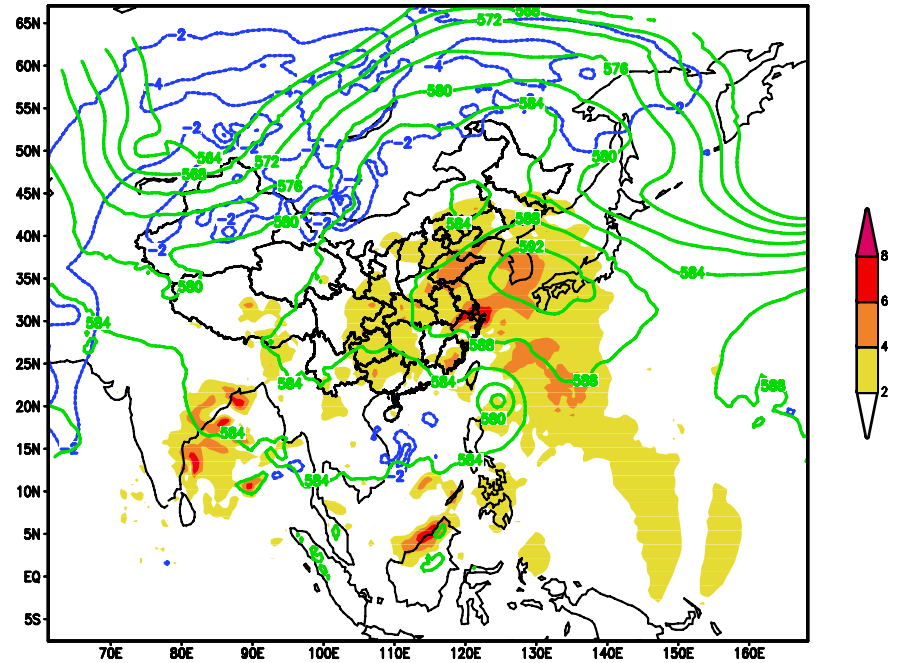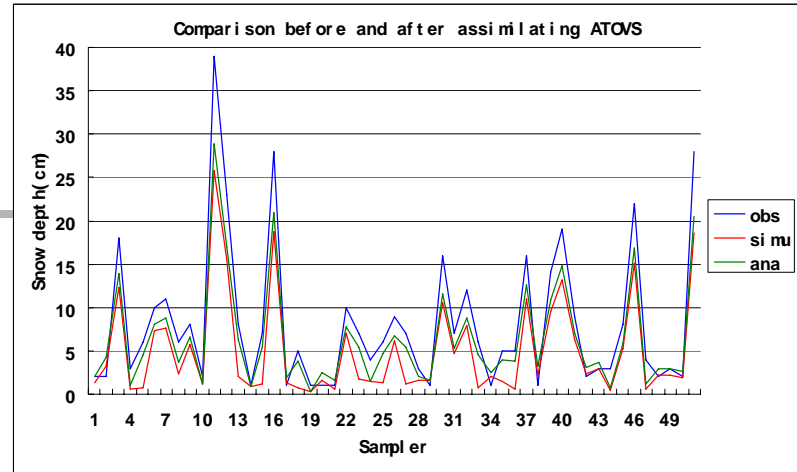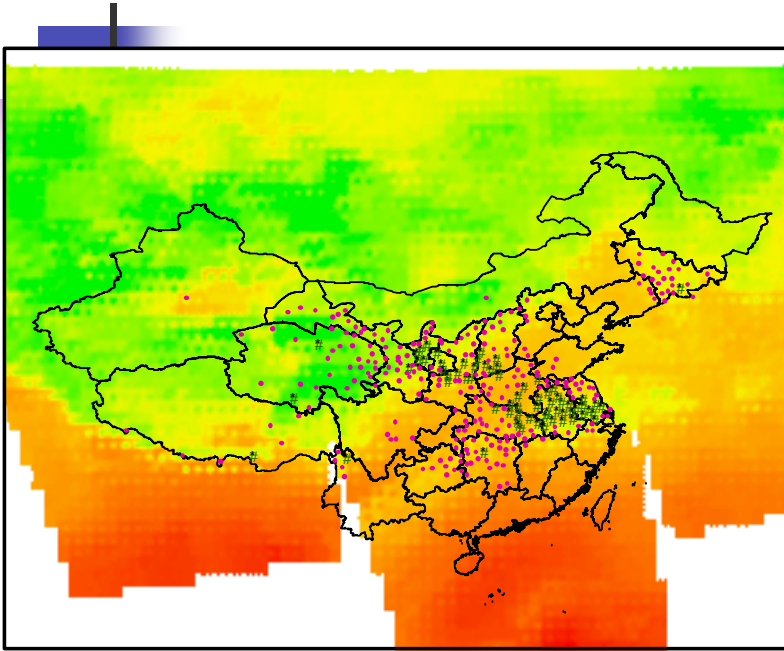
Height diff before and after assimilating FY3/VASS at 500hPa

ATOVS assimilation to monitor 2008 snow storm in South China

Comparison before and after assimilating ATOVS

Snow depth difference of assimilating ATOVS before and after