Development of Advanced Data Assimilation Techniques for use of Satellite Derived Atmospheric Motion Vectors

James Jung and Jaime Daniels

Sharon Nebuda and Agnes Lim

John Derber, Andrew Collard, Vijay Tallapragada, Mingjing Tong

and

John Le Marshall

Next Generation Global Prediction System Annual Meeting

CIMSS

Background

- Two Distinct Activities
  - Assimilation of clear air water vapor AMVs in the tropics.
    - Sharon Nebuda
  - Transition HWRF to assimilate hourly GOES AMVs using the AMV algorithm developed for GOES-R.
    - Agnes Lim

CIMSS

Assimilation of clear air water vapor AMVs

1st Year

- Incorporate quality control procedures specific to this wind type.
- Review spatial and temporal thinning.
  - Used only between 25°N and 25°S.
- Review assimilation weights.

2nd Year

- Focus on a 2 season (wet and dry) impact study
- Transition modifications to NESDIS/STAR, NCEP/EMC
- Consider adding clear air water vapor AMVs from other GEO satellites
  - Himawari,
  - Meteosat

CIMSS

Progress to date

- No quality control indicators in the current NCEP/EMC bufr files.

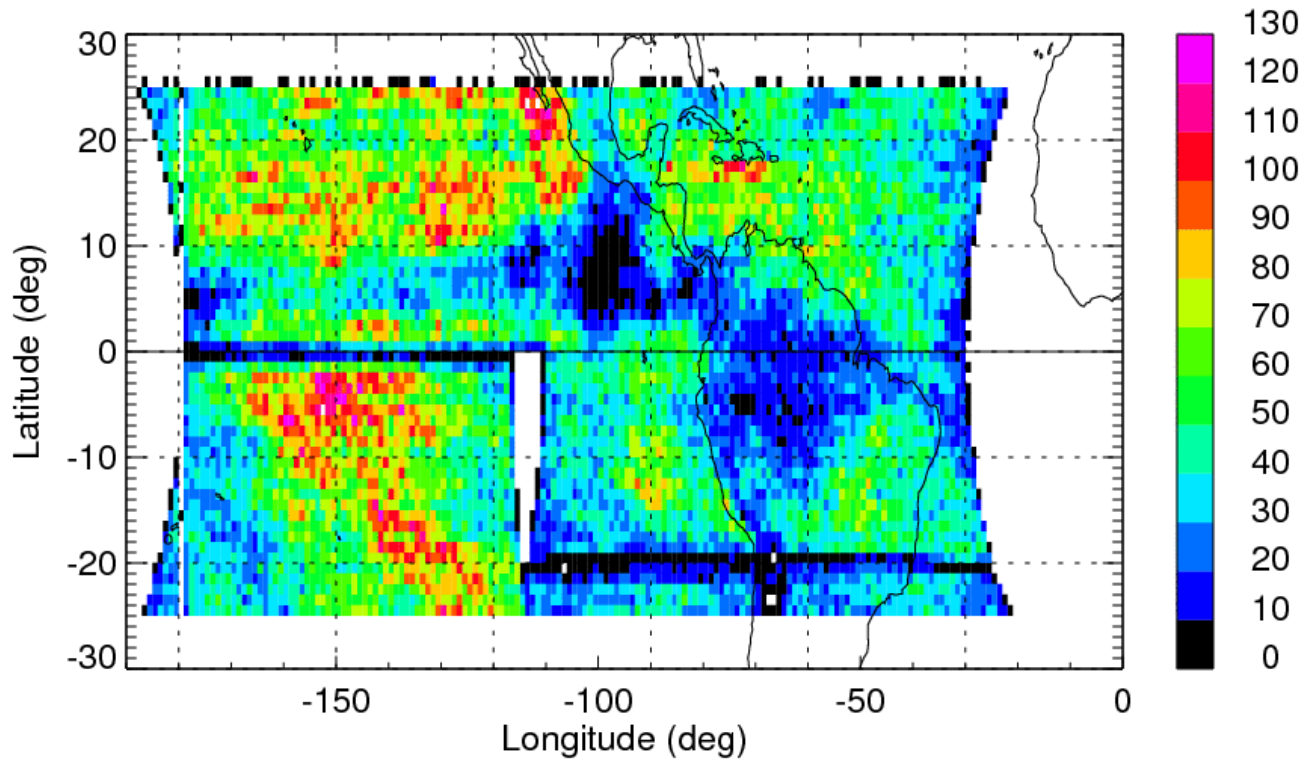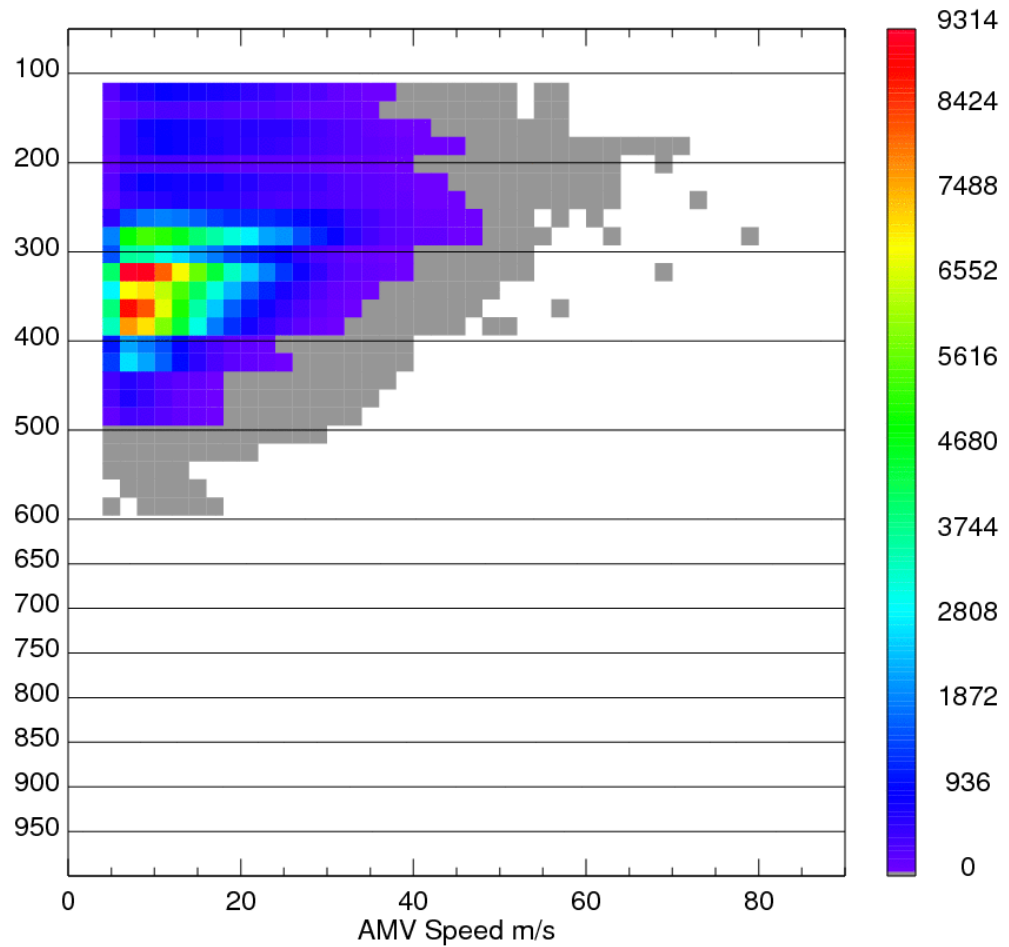- First look stats are better than expected.

AMV Type 247
May 2014

Using nwprod v2014 S4 run

Data analysis is limited to
25 S – 25 N (TP in the title)

CTLA_SPR14 GOES WV Background TP Number Density
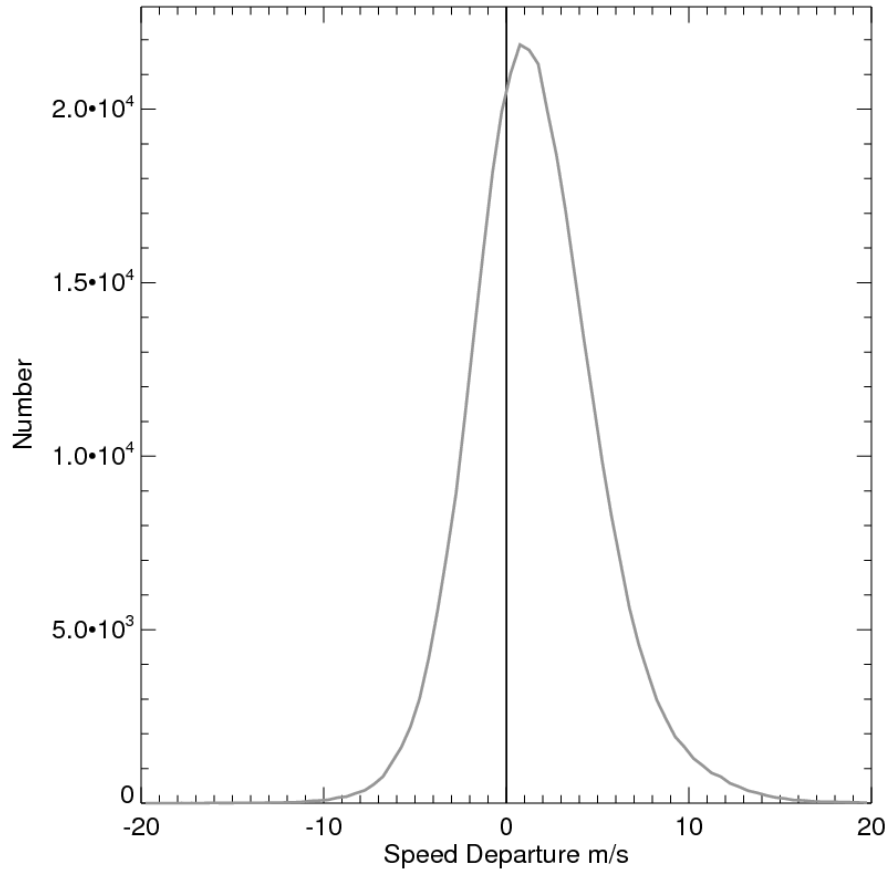Results for 2014050100 to 2014053018

CTLA_SPR14 GOES WV Background TP Number Density
Results for 2014050100 to 2014053018

2d Histogram
Speed vs Pressure

CTLA_SPR14 GOES WV Background TP Number Distribution
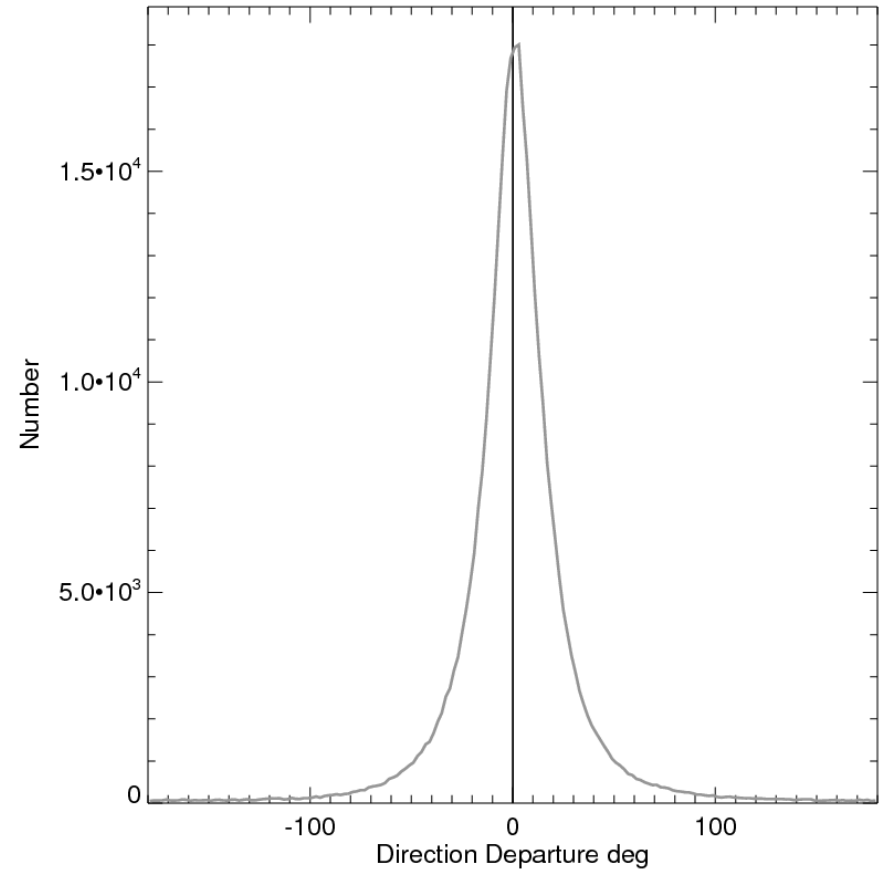Results for 2014050100 to 2014053018

M: 1.63 Sd: 3.55

CTLA_SPR14 GOES WV Background TP Number Distribution
Results for 2014050100 to 2014053018

M: 1.19 Sd:30.48

CIMSS

Transition HWRF to assimilate hourly AMVs using the GOES-R format

1st Year

- Transition HWRF to use the new hourly GOES-R like AMVs

- Generate 4 seasons of AMVs (Jaime Daniels)
  - Vis, SWIR, IR, CTWV

- Review quality control procedures

- Run 4 season impact tests

2nd Year

- Test higher spatial and temporal AMVs

- Generate high spatial and temporal resolution AMVs (Jaime Daniels)

- Review quality control procedures

- Run 4 season impact tests

CIMSS

Progress to date

- Storm time periods and locations have been identified for 2011-2014.

- Accounts to access historical GOES data are setup.

- Process has started to get access to HWRF on Jet/Zeus/Theia

CIMSS