Progress and plans for the use of radiance data in the NCEP global and regional data assimilation systems

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Current use of satellite radiance data
### Monitoring web site - http://www.emc.ncep.noaa.gov/gmb/gdas/

Global
all thinned to 145km

. **GOES-11 Sounder**
  Channels 1-15
  Individual fields of view
  4 Detectors treated separately
  Over ocean only
. **AMSU-A**

NOAA-15	Channels 1-10, 12-13, 15
NOAA-18	Channels 1-8, 10-13, 15
NOAA-19	Channels 1-7, 9-13, 15
METOP	Channels 1-6, 8-13, 15
AQUA	Channels 6, 8-13

. **AMSU-B/MHS**

NOAA-18	Channels 1-5
NOAA-19	Channels 1-5
METOP	Channels 1-5

. **HIRS**

NOAA-19	Channels 2-15
METOP	Channels 2-15

. **AIRS**

AQUA	148 Channels

. **IASI**

METOP	165 Channels

Regional

. **GOES-11 Sounder**
  Channels 1-15
  Individual fields of view
  4 Detectors treated separately
  Over ocean only
  Thinned to 120km
. **AMSU-A**

NOAA-15	Channels 1-10, 12-13, 15
NOAA-18	Channels 1-8, 10-13, 15
NOAA-19	Channels 1-7, 9-13, 15
METOP	Channels1-6, 8-13, 15
	Thinned to 60km

. **AMSU-B/MHS**

NOAA-18	Channels 1-5
METOP	Channels 1-5
	Thinned to 60km

. **HIRS**

NOAA-19	Channels 2-15
METOP	Channels 2-15
	Thinned to 120km

. **AIRS**

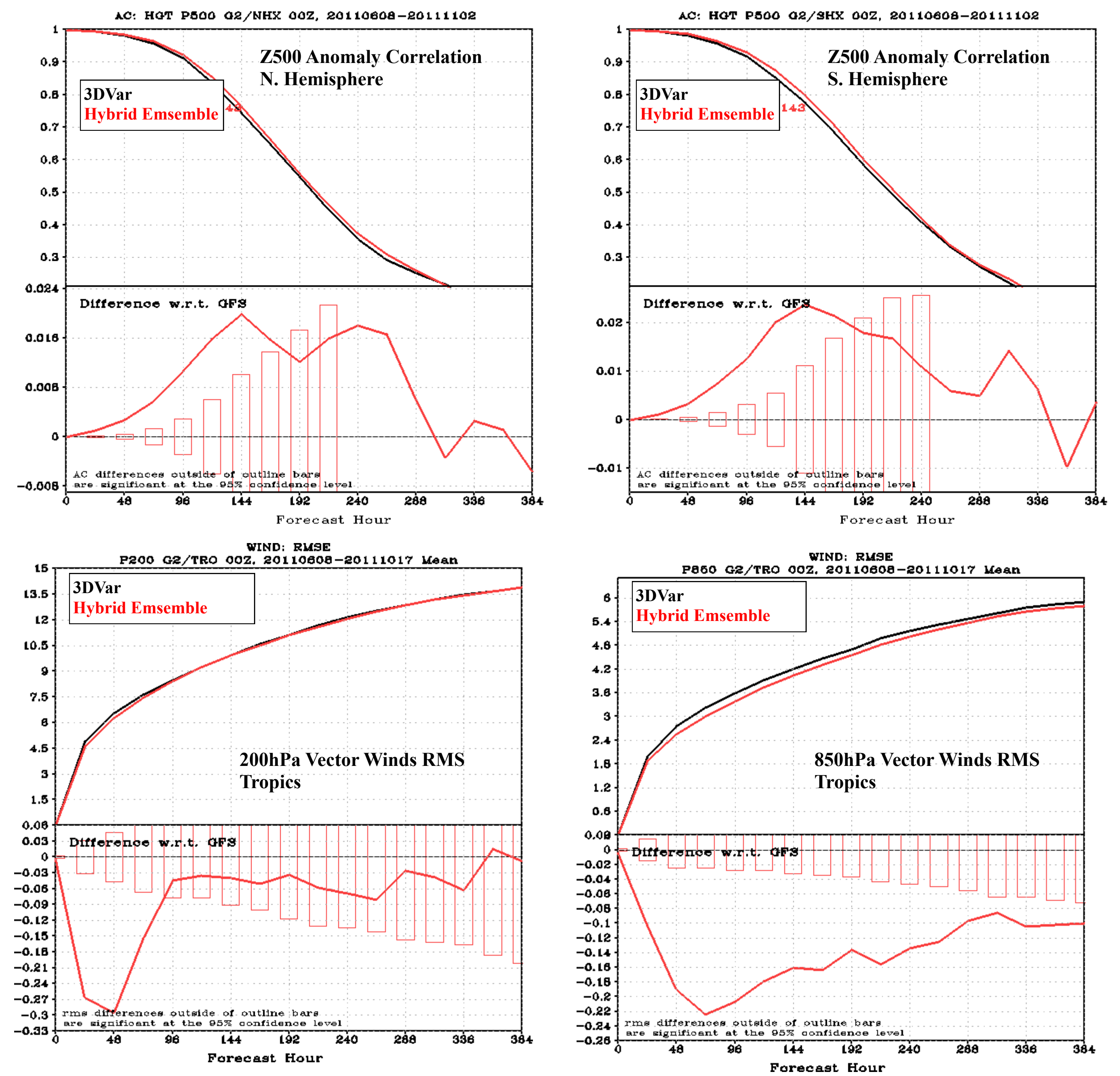|	
AQUA	148 Channels
	Thinned to 120km

Sample monitoring page for AMSU-A:
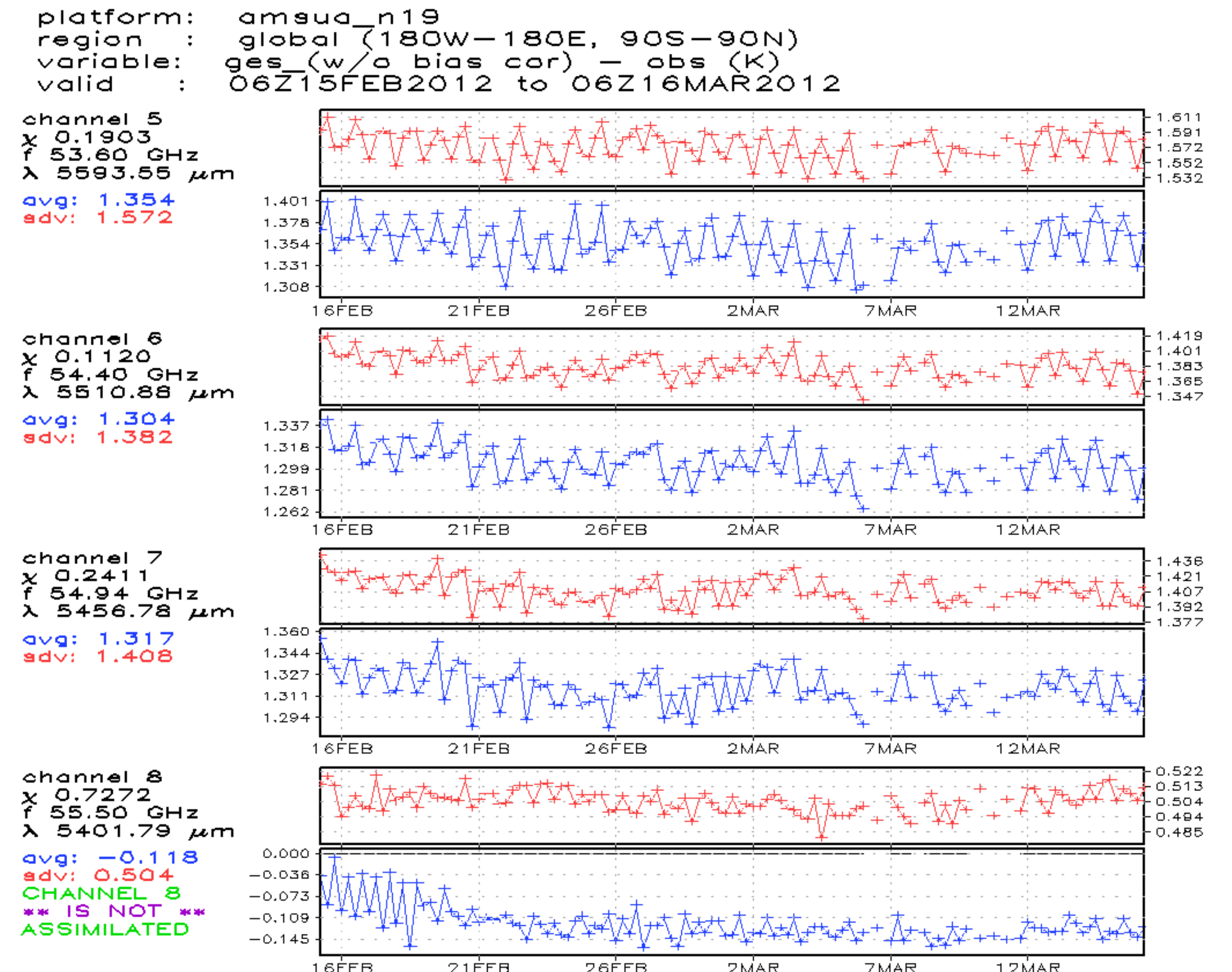
Global model upgrade June 2012

. **Hybrid Ensemble Kalman Filter Assimilation**
  . Uses Ensemble members at different resolution (T254 for operations) from analysis
  . Improves background error and thus projection of information on analysis fields
. **Add NPP-Suomi ATMS assimilation** (see talk by Collard et al.)
. **Assimilate the MSG Seviri clear-sky brightness temperature**
. **product**
. **Add GOES-13/15 sounder assimilation**
. **Improved satellite monitoring code**
. **Enable monitoring for NPP-Suomi CrIS and MetOp-B (IASI/AMSU-A/MHS)**
. **GPSRO bending angles (rather then refractivity) plus inclusion of atmospheric compressibility factors.**

Response to a 1K temperature increment at model level 15 for 3DVar, Ensemble B and hybrid B.

Forecast impact relative to operations of using the EnKF-hybrid data assimilation scheme
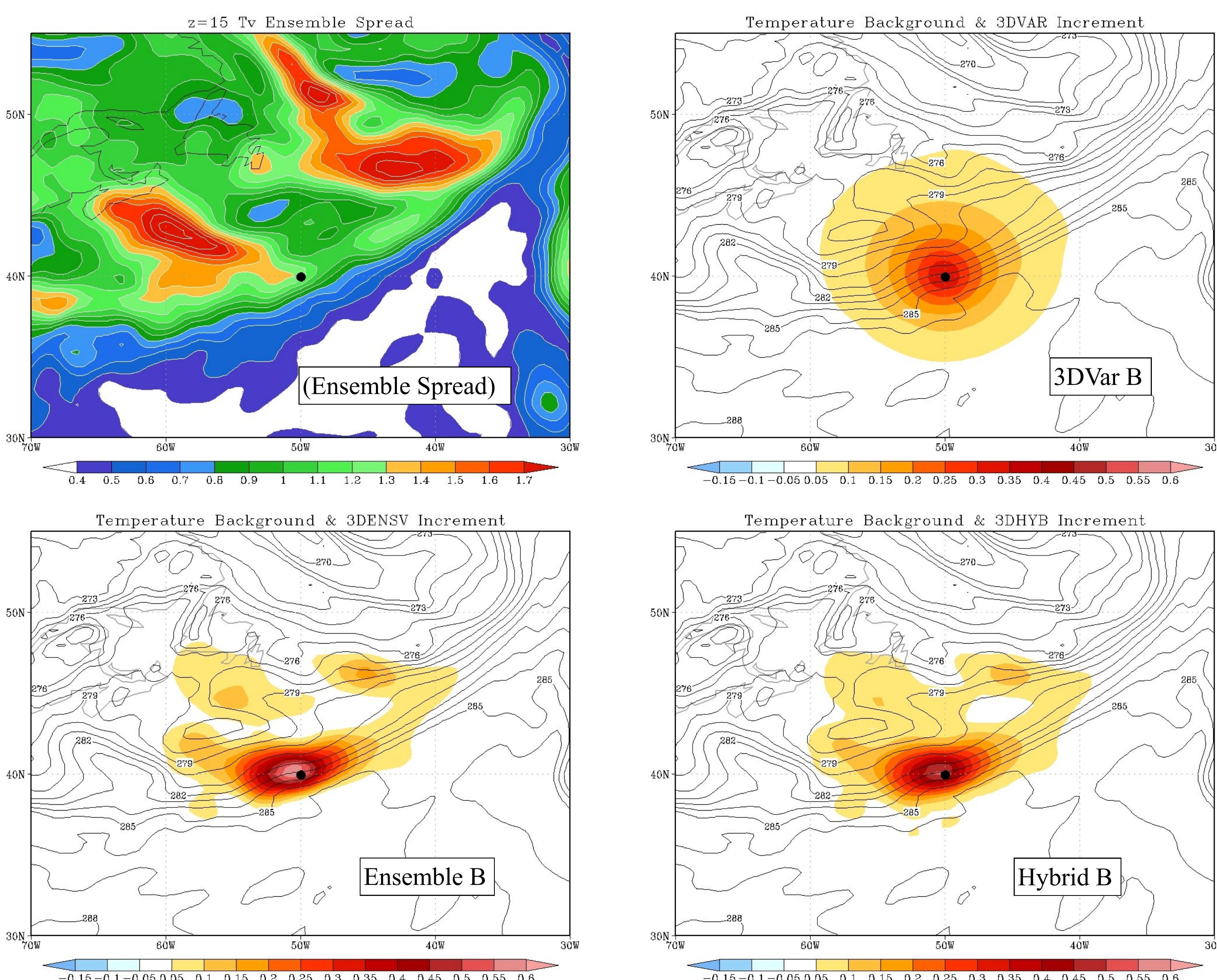
Ongoing NCEP/JCSDA satellite data assimilation developments

. **Assimilation of Suomi-NPP CrIS radiances**
. **Improved use of IASI /AIRS/CrIS moisture channels**
. **Inclusion of Clouds**
.   (See talk by Min-Jeong Kim et al.)
. **New combined (angle plus airmass) radiance bias correction**
. **Radiance based SST analysis (includes diurnal cycle)**
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