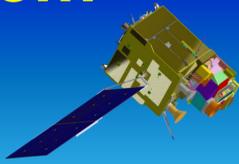


The impact of the COMS data on the KMA NWP System

In-Chul Shin¹, Jae-Gwan Kim¹, Chu-Yong Chung¹, Seon-Kyun Baek¹, and Jung-Rim Lee²



¹National Meteorological Satellite Center, Korea Meteorological Administration

²National Institute of Meteorological Sciences, Korea Meteorological Administration

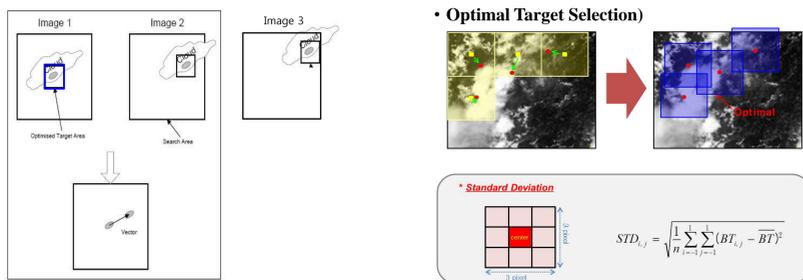
Introduction

- National Meteorological Satellite Center (NMSC) of Korea Meteorological Administration (KMA) has been operating of the Korean meteorological geostationary satellite, Communication, Ocean, and Meteorological Satellite (COMS) officially since April 1, 2011. Atmospheric Motion Vector (AMV) and Clear Sky Radiance (CSR) products are operationally used in global forecast model for data assimilation in the KMA numerical weather prediction (NWP) system since December 2011 and June 2013, respectively.
- The improved COMS AMV and CSR products are provided on KMA NWP system. We have performed the update test to improve the impact of COMS data assimilation on the KMA NWP system such as changing resolution from T24 to T16 for AMV and bias correction, pixel based CSR test.
- New satellite data products will be tested in the KMA higher resolution system(resolution, 17km), then evaluated whether to go operation or not.

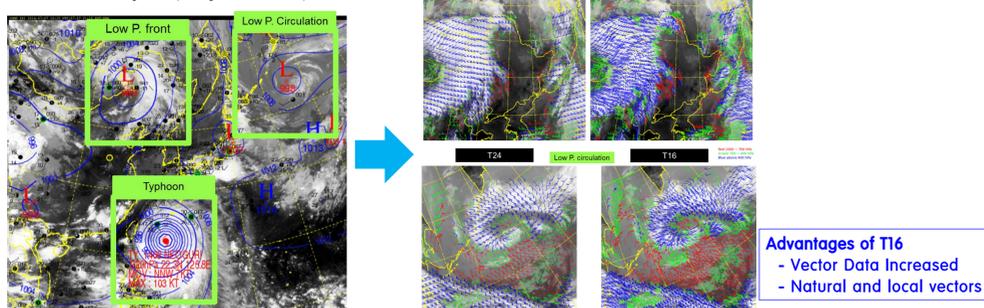
Improvement of COMS AMV and CSR products

Atmosphere Motion Vector

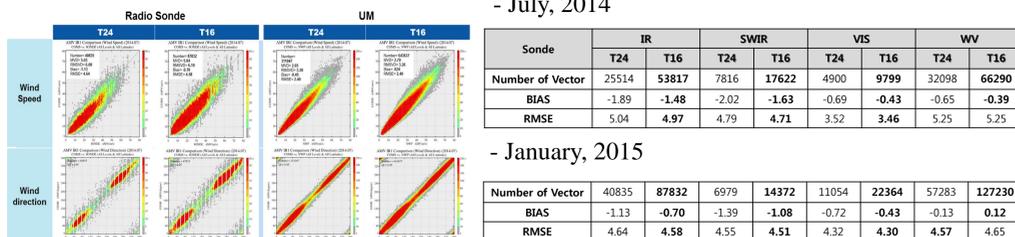
- To improve target size and target selection method of AMV is represented as follows:
 - Target size pixels : 24 x 24 (about 96km, T24) → **16 x 16 (about 64 km, T16)**
 - Grid interval pixels : 12 (about 48 km interval) → **8 (about 32 km interval)**
 - Target selection method : REG(Regular) → **OTS(Optimal Target Selection)**



Case analysis(July 7, 2014)

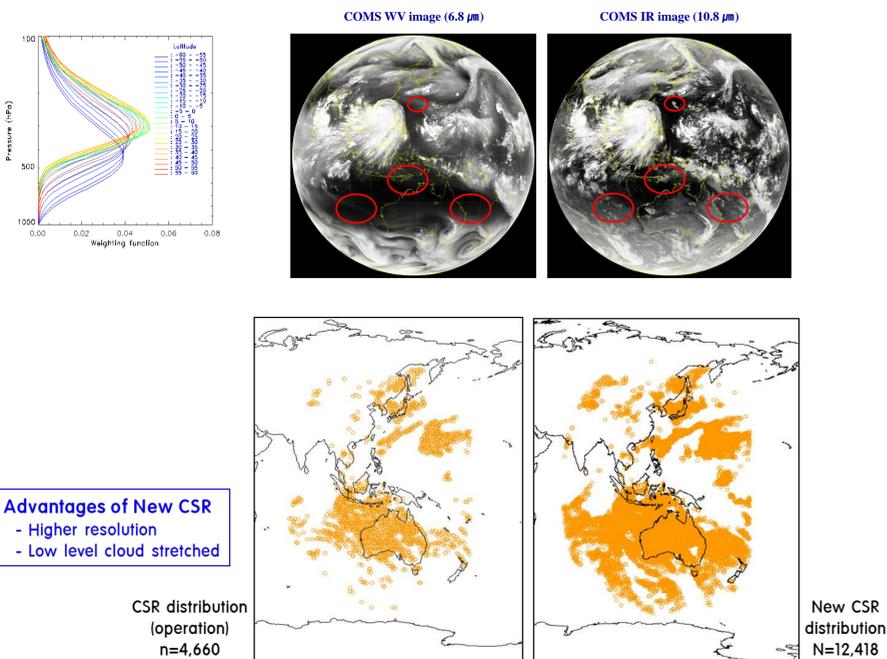


Validation results

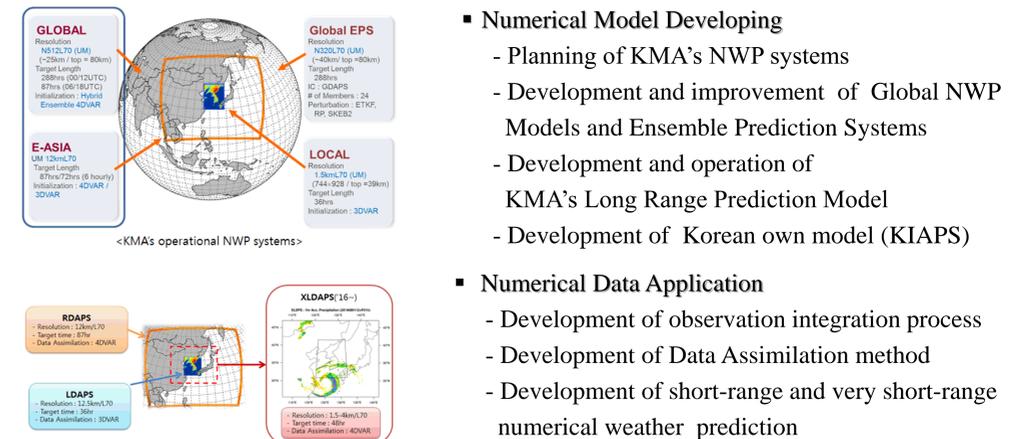


Clear sky Radiance

- To improve resolution and cloud detection of AMV is represented as follows:
 - Mean brightness temperature for 7x7 pixels(about 28km resolution) → **1x1 pixels(about 4km resolution)**
 - Only WV channel with IR clear fraction of COMS → **WV clear faction**
 - Bias correction, thinning test (120km, 60min)

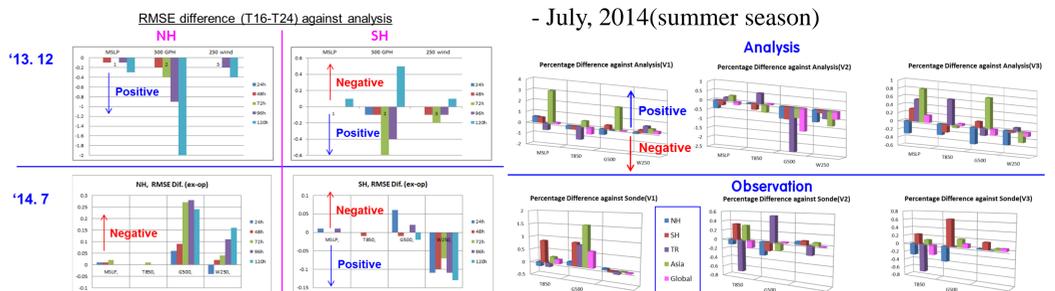


KMA Operational NWP system



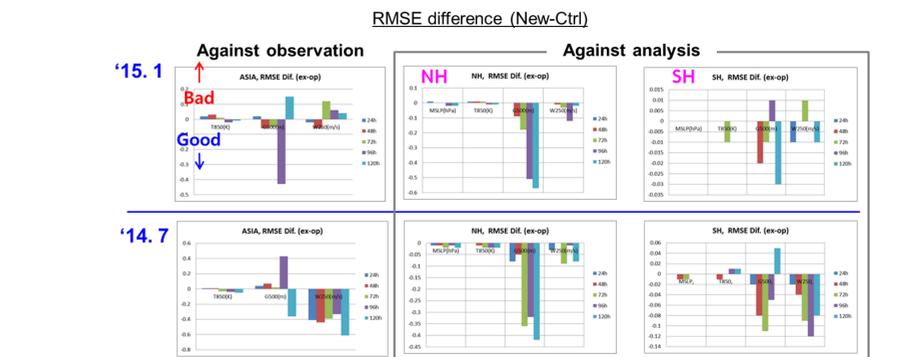
Impacts of COMS AMV and CSR on the KMA NWP system

- Impact experiment of COMS AMV**
 - Period : 2013. 12. 1. ~ 2013. 12. 31.(Winter) 2014. 7. 1. ~ 2014. 7. 31.(Summer)
 - Verification : Analysis, Observation
 - KMA NWP impact of AMV target sizes(T24 & T16) : Experiments on winter and summer



- For better performance with higher resolution(T16) data
 - Blacklisting: Towards increased use of T16 data reflecting seasonal variation
 - Error profile: Apply height assignment error of T16 according to seasons
 - Thinning: 2 degrees, 100 hPa, 60 min

- Impact experiment of COMS CSR**
 - Period : 2014. 7. 1. ~ 2014. 7. 31. (Summer) 2015. 1. 1. ~ 2015. 1. 31. (Winter)
 - CNTL : KMA operation with operational CSR, **New : with new CSR**
 - Verification : Analysis, Observation



- Stretch the use of clear sky radiance to low level cloud and higher resolution data → Improvement of GPH at 500 hPa in the NH and SH

Summary

- To improve the performance of COMS data in KMA NWP system, we are provided new products and tested in the model.
- KMA/NMSC will continuously support to improving the impact results of COMS products on the KMA NWP system.
- Also, new satellite data products will be tested in the KMA higher resolution global system(17km).