

# The Results from Thinning EUMETSAT-9 Satellite Winds



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## INTRODUCTION

EUMETSAT changed the criteria to distribute the satellite wind products from METOP-7 to METOP-9 which led the satellite winds data from METOP-9 has 8-10 times of the data from METOP-7. The negative impacts on forecasts were found when all METOP-9 satellite winds were assimilated in NCEP assimilation and forecast system. The correlated errors from satellite winds may have cause the negative forecast impact. In this study, the IR and visible cloud drift winds from METOP-9 were thinned in order to reduce the correlated errors.

## THE DATA COVERAGE AND THINNING METHOD

The METOP-9 satellite winds covers from 60 degree south to 60 degree north at latitude and west 60 degree and east 60 degree at longitude. The vertical level covers from surface to 150mb. Figure 1a is an example of data distribution at lower level (around 915mb). Figure 1b

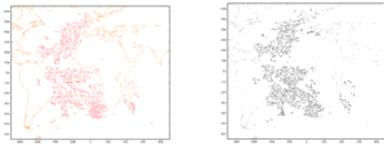


Figure 1a. The data distribution before thinning at 915mb. Figure 1b. The data distribution after thinning at 915mb.

The thinning method was modified satellite data thinning algorithm in EMC global data assimilation system(GSI). The one observation was chosen based on data quality, the observation position, and closeness to the cycle time. The thinning box is 200Kmx200kxm100mb. About 15% observations are kept in the system.

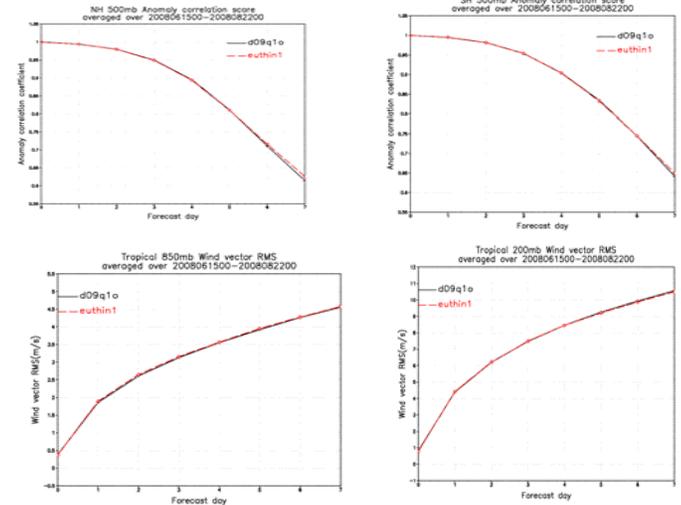
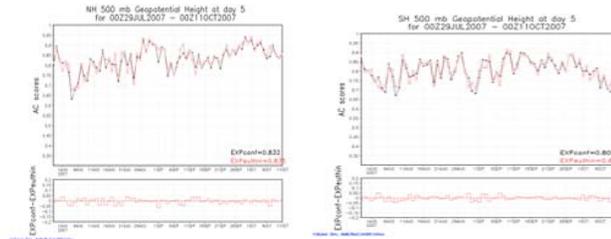
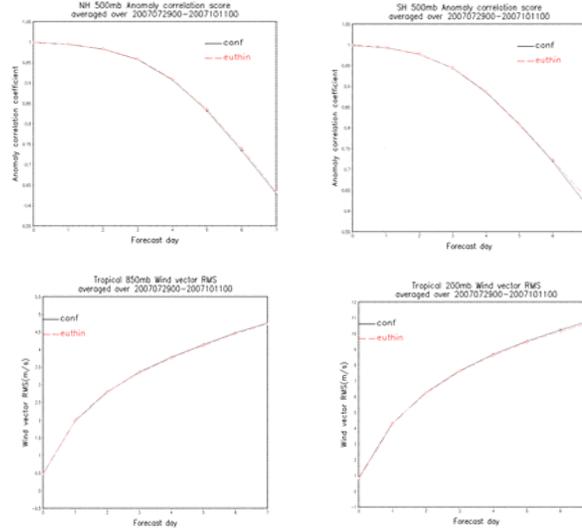
## THE EXPERIMENTS

Forecast and assimilation experiments were conducted over the period of July 29 to October 11, 2007 and Jun 15-August 22, 2008. For the first period, the forecast system was operational system implemented in May 2007, with T382 and 64 hybrid (pressure and sigma) vertical levels. The data assimilation system was 2007 operational version plus some options such as variational quality control, the first order time extrapolation to the observation(FOTO), flow dependent background error variance. The thinned MET-9 satellite wind did make into implementation in 2008 spring. The another period was tested with slightly different forecast and assimilation system as first period, the system was 2009 spring implementation version (implemented in February).

## RESULTS

1. The results from first period:(Verification against its own analysis (averaged over July 29-October 11,2007)

(— Control run, — Test run)



## SUMMARY

Slightly positive forecast impacts in the mid-latitude and neutral forecast impacts in the tropical region were found when thinned METOP-9 satellite winds were assimilated in EMC data assimilation and forecast system for two experiment periods.

The right thinning method including proper thinning box and criteria is an efficient way to deal with data with more severe correlated error