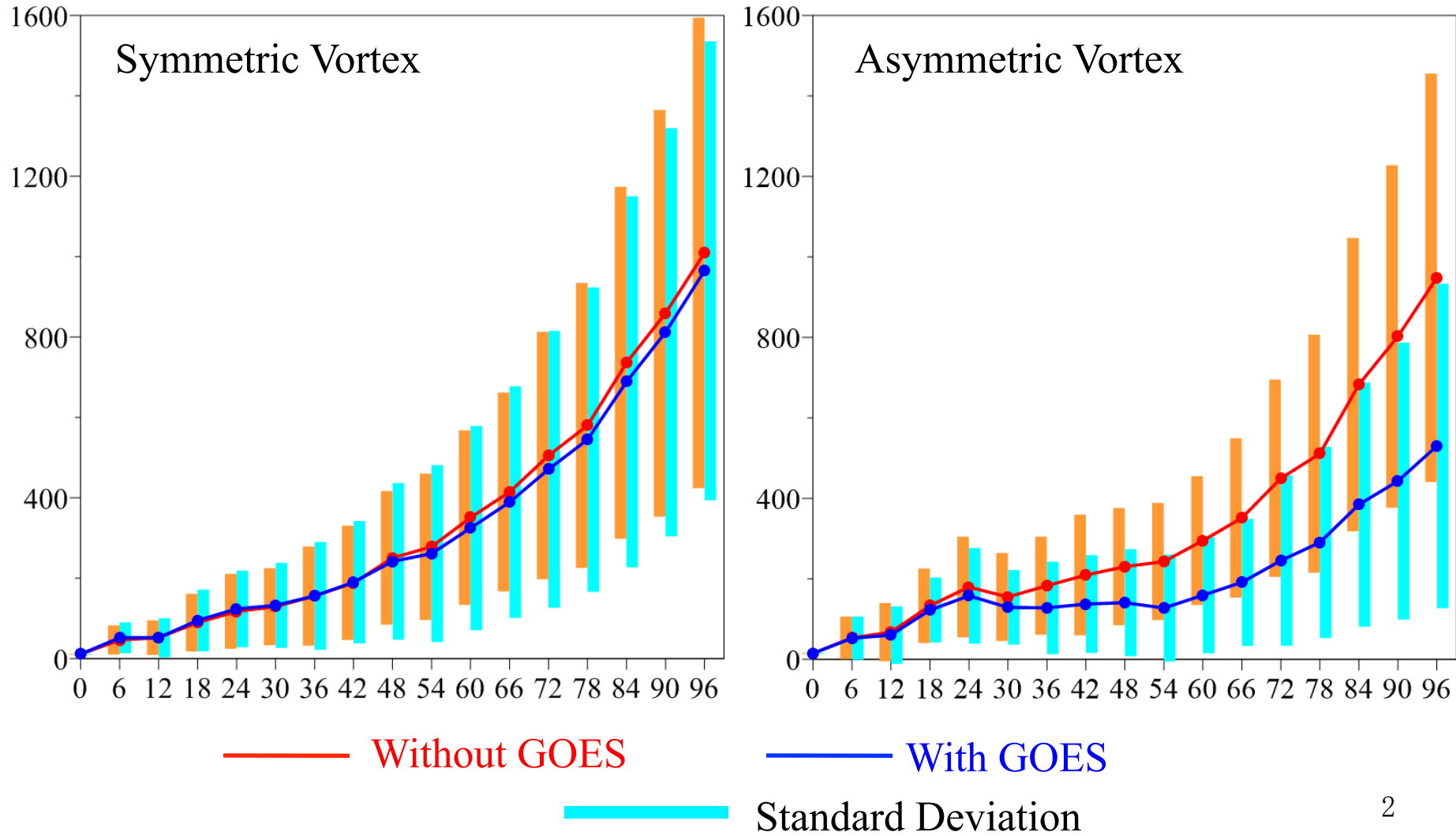


Objectives

To conduct research and numerical tests on satellite data assimilation in the following three closely-related areas:

- 1) Deriving realistic observation-based vortex structures based on satellite retrieval products;
- 2) Refining cloud detection and quality control algorithms for satellite radiance data assimilation including ATMS, CrIS, AMSU-A, MHS, AMSR-2 and GOES imager; and
- 3) Accurately estimating satellite biases under both clear-sky and cloudy conditions.

Impacts of GOES-13/15 Imager Radiance Assimilation of Tropical Cyclone Track Prediction (2012)



Potential Applications at NCEP

1. MHS Data Assimilation

Zou, X., Z. Qin, and F. Weng, 2013: Improved quantitative precipitation forecasts by MHS radiance data assimilation with a newly added cloud detection algorithm, *Mon. Wea. Rev.*, **141**, 3203-3221.

Qin, Z. and X. Zou, 2015: Development and evaluation of a new index for MHS cloud detection over land. *Mon. Wea. Rev.*, (revised)

2. GOES Imager Data Assimilation

Zou, X. and C. Da, 2014: An objective regional cloud mask algorithm for GOES imager radiances with pixel-dependent thresholds. *J. Geophys. Res.*, **119**, doi: 10.1002/2014JD021455.

Zou, X., Z. Qin and Y. Zheng, 2015: Improved tropical storm forecasts with GOES-13/15 imager radiance assimilation and asymmetric vortex initialization in HWRF. *Mon. Wea. Rev.*, (in press)