# The assimilation of IASI at KIAPS

Hyoung-Wook Chun, Ji-Hyun Ha, Seoleun Shin, and In-Hyuk Kwon

Korea Institute of Atmospheric Prediction Systems (KIAPS), Seoul Korea (hwchun@kiaps.org)



## Introduction

- Infrared Atmospheric Sounding Interferometer (IASI) is one of key observations on the KIAPS Package for Observation Processing (KPOP).
- Cloud screening and bias correction are important process of KPOP for IASI. These process are greatly dependent on background status.
- The experiment for the IASI data assimilation are conducted on the hybrid DA (currently 3DVAR) system which developed for the KIPAS integrated model (KIM).

### **Purposes of this study:**

- To Introduce the assimilation of IASI at KIAPS
- To validate its performance, the results are compared with denial test in observation space and model space.

### **IASI processing on the KPOP**



- IASI 1d (1 15 January 2016)
  - This data made by Met Office and transfer to KMA (Korea Meteorological Admin.)
  - KIAPS obtains the data from KMA

- Bias correction
  - Scan correction: simple average
  - Air-mass correction: multiple regression with 2 kinds thickness (850-300 hPa, 200-50 hPa) Adaptive method for the single background on time



- Background (6hour forecast)
  - KIM2.2: KIAPS Integrated Model with 3DVAR version 2.2
    - : Model resolution: ne120np4 (~25km), 3DVAR resolution: ne30np4 (~100km)
    - : Radiosonde, Surface, Aircraft, GPS-RO, AMV, AMSU-A, ATMS, IASI, CrIS
  - KIM version updates every four months.
- Used IASI channels
  - 60 channels (Only temperature(T) sounding channels)
  - These channels are selected among the channels of UM OPS (Hilton et al.,
  - 2009) when temperature jacobian peak is less than the level of 50 hPa
- Quality control (QC)
  - Sanity check, Background check, Outlier check
  - Cloud screening (from NWP SAF, McNally and Watts, 2003)
- Thinning
  - Select a most clear pixel within a thinning box
- Thinning box size is adjustable. In this study, it is 3° by 3°





• IASI assimilation works well at KIAPS. After IASI assimilation, the analysis error for IASI assimilation channels. There are large positive effect on upper channels (38-236) which have temperature jacobian peak around 50-150 hPa.

• There are positive effect on lower troposphere (700-1000 hPa) and upper stratosphere (1-7 hPa). In contrast to in the observation space, there a negative or neutral effect on 30-300 hPa in model space. Anomaly correlations for experiment including IASI are slightly better than those of denial test. But we need to check the background of EXP after 9 Jan. 2016. IASI.



