1. Introduction

- In Noh et al. (2017), the new IASI channels were selected using a new approach based on one-dimensional variational analysis (1D-Var).
- In the trial experiment using the UM system, upper-tropospheric moist biases shown in the control run were significantly reduced in the experiment run with newly selected IASI channels.
- In this study, we tried to assess the impact of improved moisture field by new IASI channels on the precipitation forecast over East Asia for the summer period.

2. New IASI channels

- Newly selected IASI channels (#200)
- Operational IASI channels (#183)

3. Impact on global forecasting

- The new channels had an overall neutral impact in terms of improvement in forecasts, as compared with results from the operational channels.
- However, upper-tropospheric moist biases shown in the control run, assuming that the water vapor amount finally becomes precipitation, the bias reduction seems to be related to the reduced amount of moisture in the model analysis.

4. Trial experiment using KMA UM system

- KMA global Unified Model with 4D-Var (N320, 40km)
- Control run with operational IASI channels
- Experiment run with newly selected IASI channels
- Period: 15 Jun – 31 July 2015 (45 days)

b. Analysis and observations verification

- In the trial experiment using the UM system, upper-tropospheric moist biases shown in the control run were significantly reduced in the experiment run with newly selected IASI channels.
- In this study, we tried to assess the impact of improved moisture field by new IASI channels on the precipitation forecast over East Asia for the summer period.

5. Impact on precipitation forecast over East Asia

a. Threat Score (TS)
- T+0
- T+12
- T+24
- T+36
- T+48

b. Bias
- CNTL (OBS)
- EXP (OBS)
- CNTL (ANLY)
- EXP (ANLY)

6. Validation of model TPW using MiRS

- Microwave Integrated Retrieval System (MiRS) by NOAA
- Sensors: AMSU-B, MHS, and SSM/I-S
- Period: 1 July – 31 July 2015

b. Time series of TPW bias for CNTL and EXP runs

7. Summary

- In the trial experiment, the new IASI channels had a neutral impact on precipitation forecast in terms of accuracy in location (based on “TS” results).
- However, the overestimated size of forecasted precipitation area shown in the control run was reduced for the experiment run (based on “Bias” results).
- The “Bias” improvement for the experiment run seems to be due to the reduction of humid bias shown in the control run, assuming that the water vapor amount finally becomes precipitation.

8. Reference