

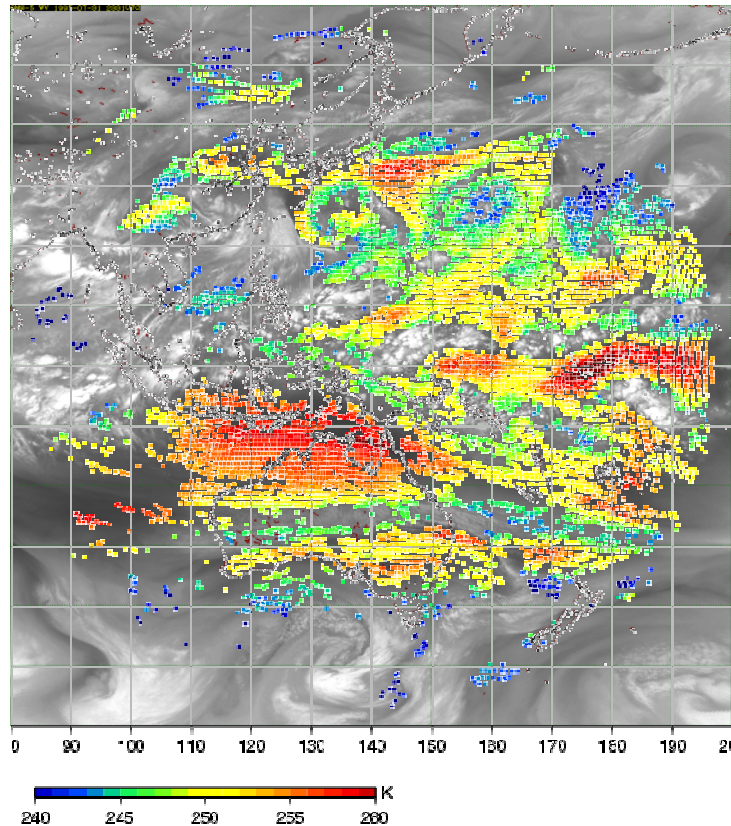
15-year Clear Sky Radiance dataset processing at JMA/MSC

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About Clear Sky Radiance (CSR) Data

WV channel CSR at 00UTC of 1st Aug. 1995

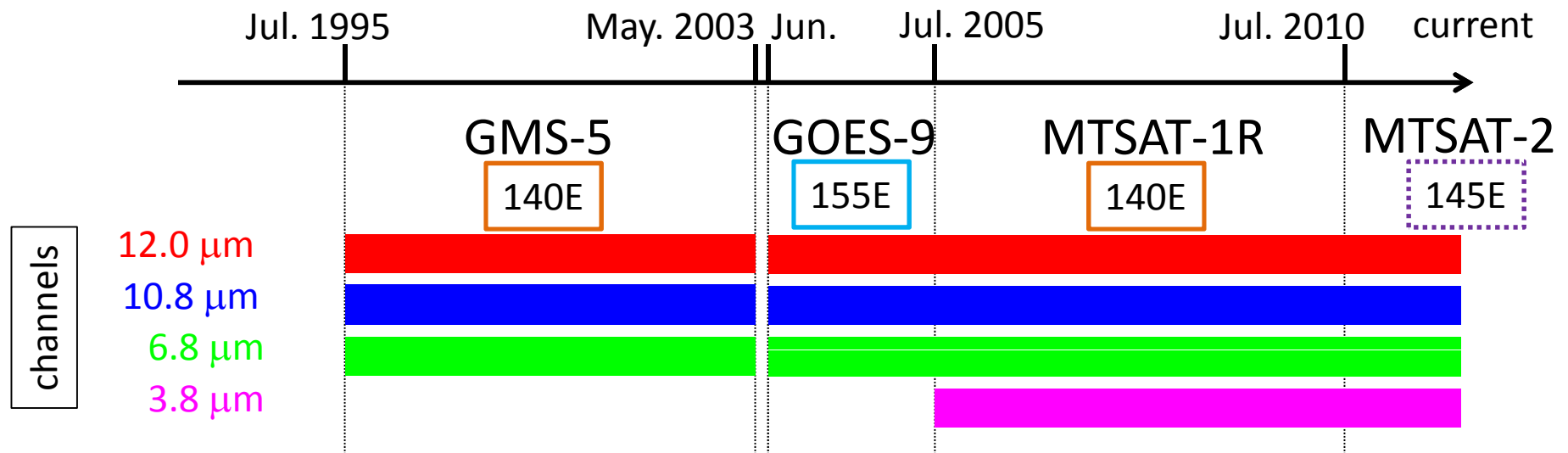


- CSR is infrared T_b data of clear sky area.
- Purpose of CSR product is use for NWP data assimilation, especially effective for WV information improvement.
- JMA operates CSR product from geostationary satellite data and distribute to NWP center in real time.

15-year CSR dataset

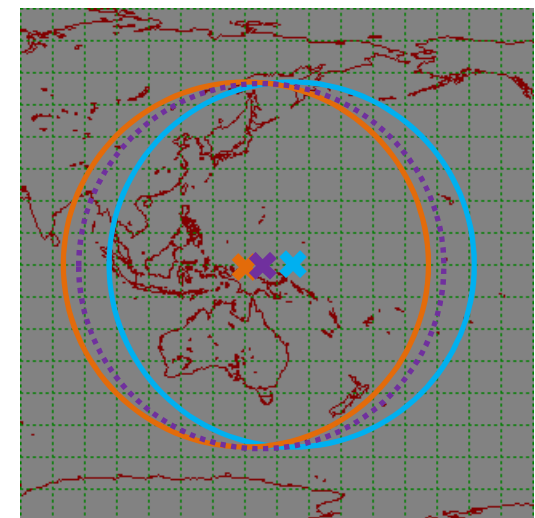
- CSR data is also useable for re-analysis using variational assimilation system.
- CSR was selected as pilot product of SCOPE-CM project.
- JMA generated historical CSR dataset from Jul. 1995 over the west Pacific region.
- The dataset has been provided to the re-analysis community.

Specification of 15-year CSR dataset

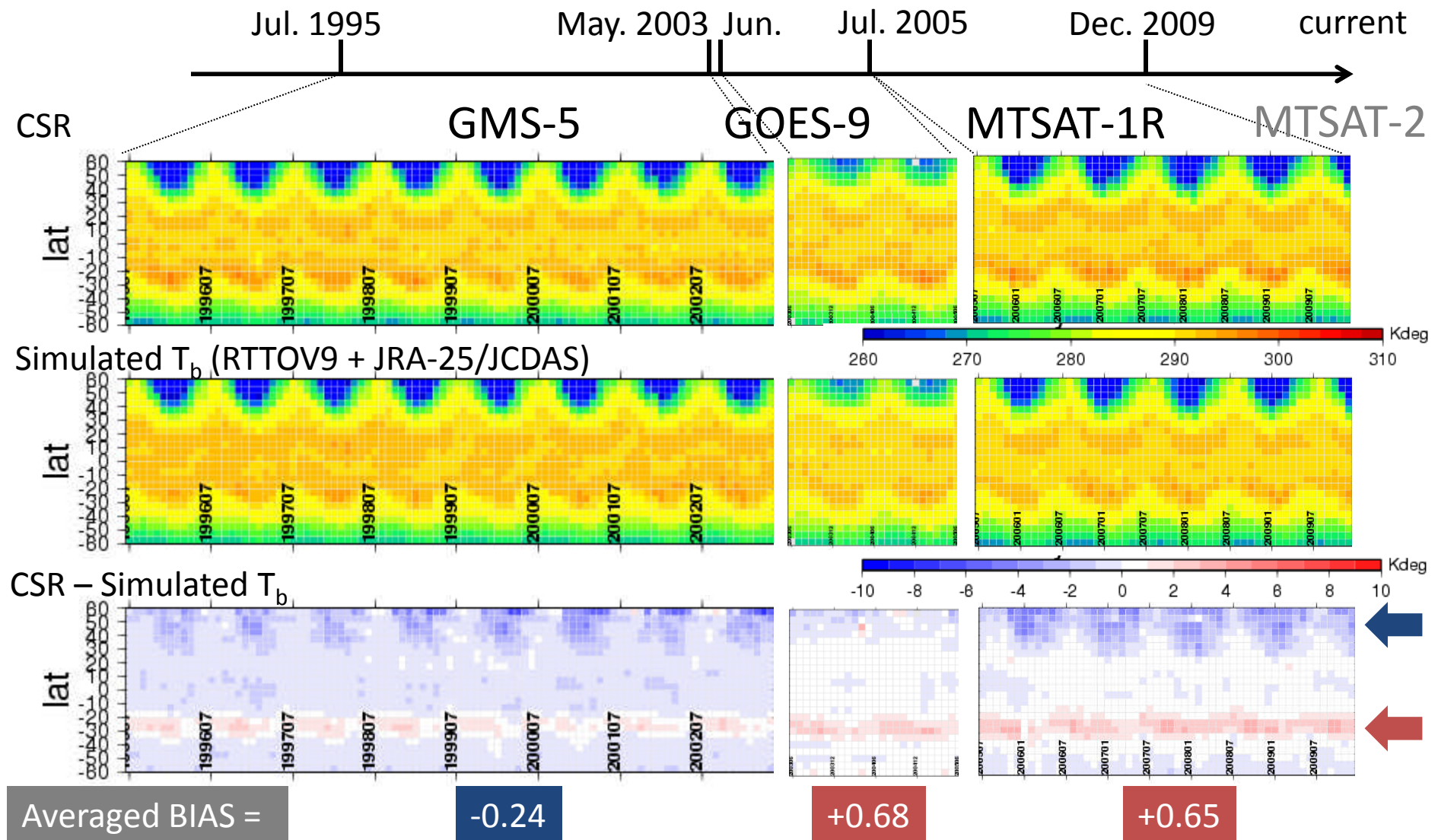


- Area region with $\theta_{\text{SatZen}} \leq 65.0$
- Resolution
 - Temporal Hourly
 - Horizontal $\sim 60 \times 60 \text{ km}^2$

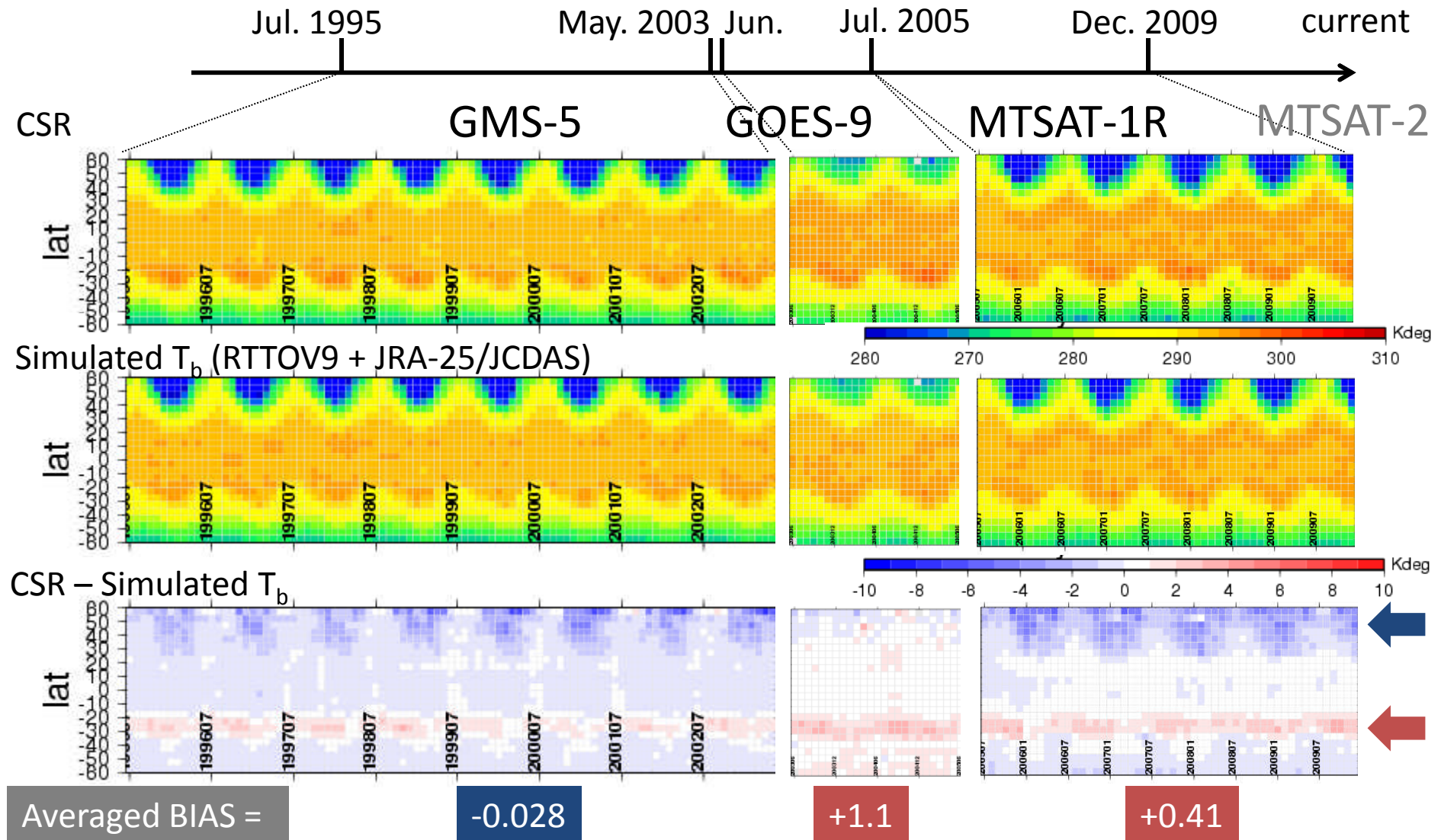
Output is averaged T_b of clear pixels in a 16 x 16 pixels segment



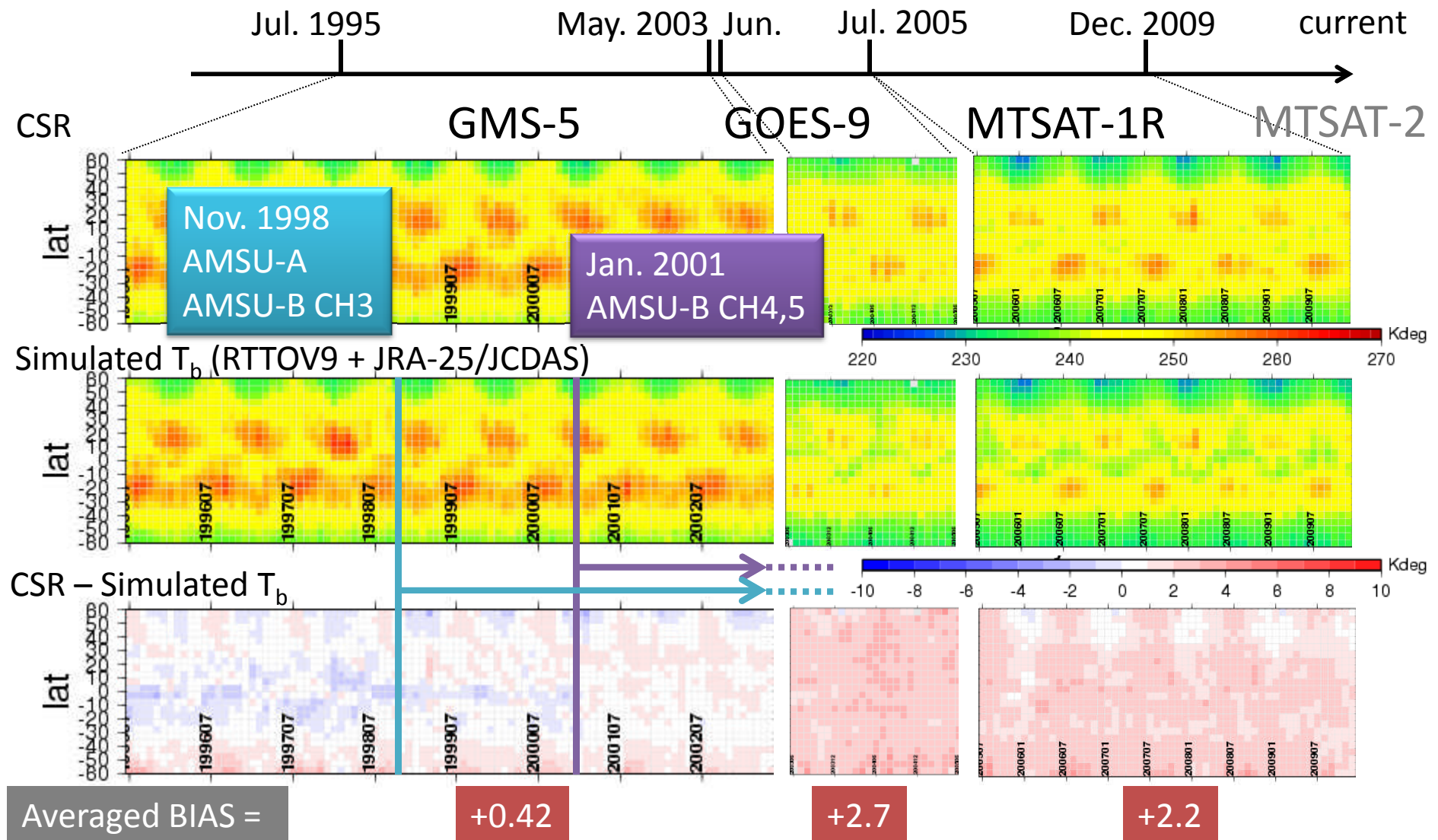
Zonal mean Comparison with Simulated T_b s ($12.0\ \mu\text{m}$)



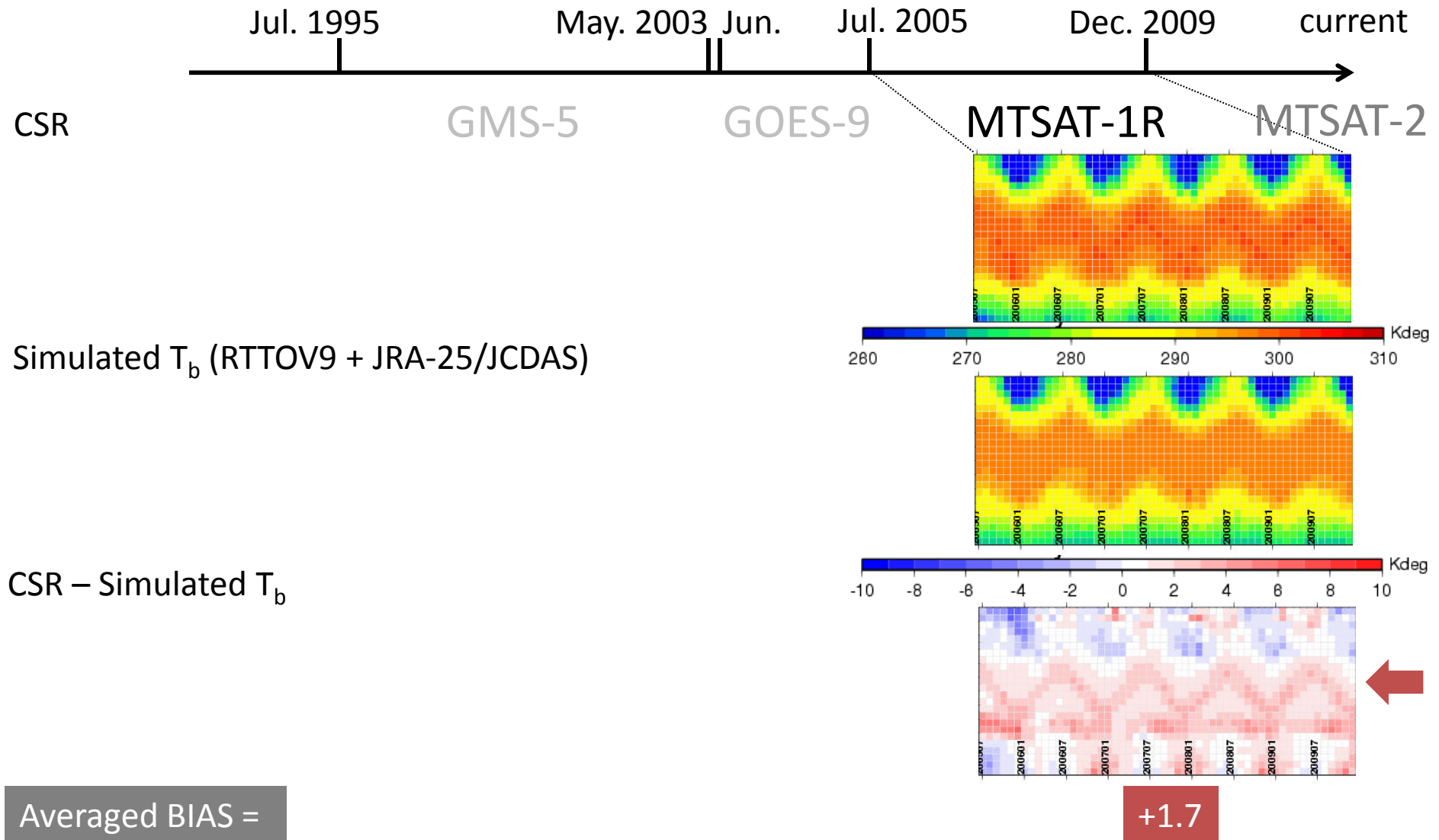
Zonal mean Comparison with Simulated T_b s ($10.8 \mu\text{m}$)



Zonal mean Comparison with Simulated T_b s ($6.8\ \mu\text{m}$)



Zonal mean Comparison with Simulated T_b s ($3.8 \mu m$)



Observing System Experiment of CSR using the JRA-55 data assimilation system

Object :

confirm the effectivity of CSR data use for JRA-55 on ahead

Experiment Design :

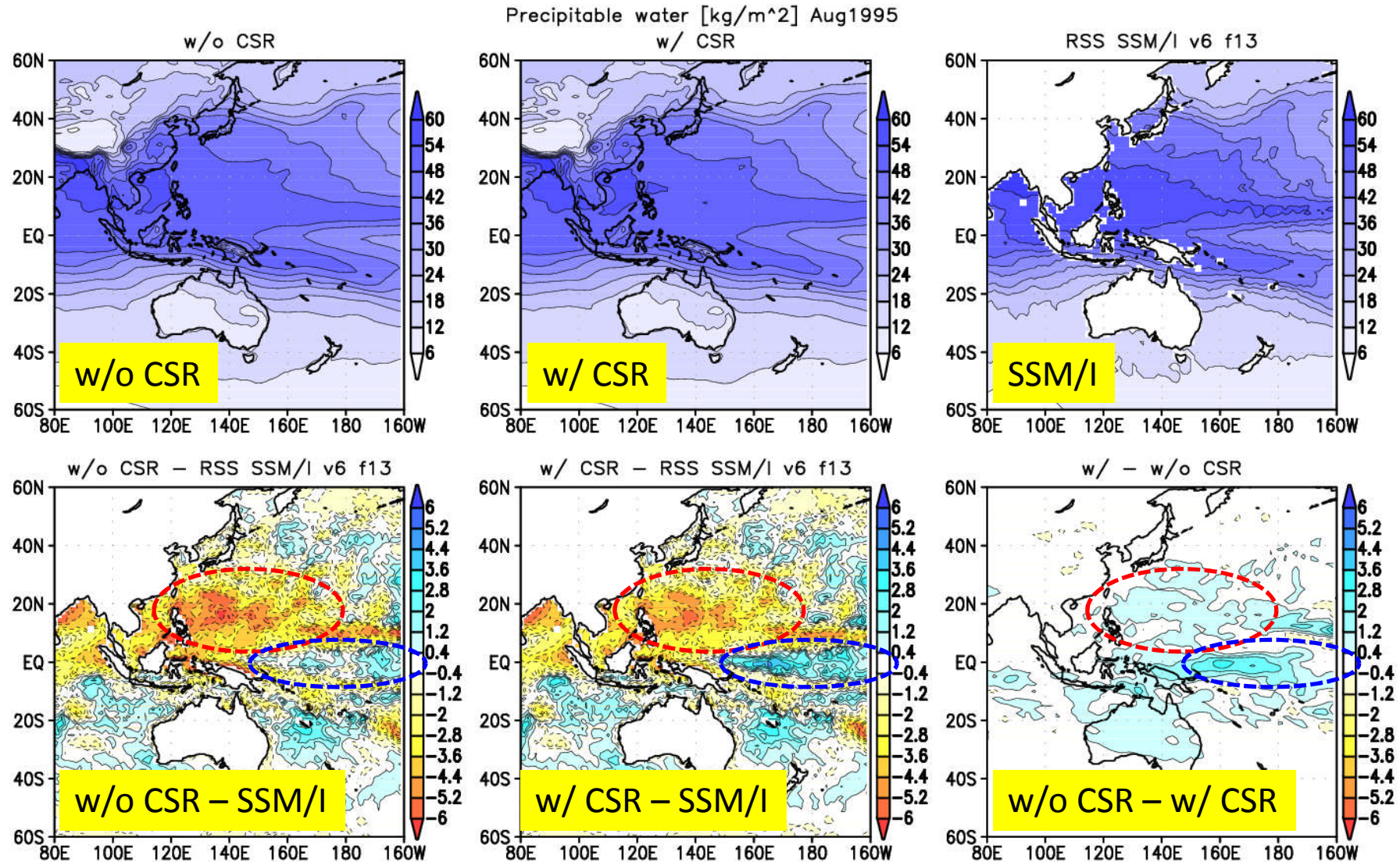
- Experiment system
 - Forecast Model: TL319L60 (~60km horizontal res.)
 - Assimilation: 4D-var with variational bias correction
 - Radiative transfer model: RTTOV9
- Experiment term
 - 26th Jul. 1995 ~ 9th Sep. 1995 (summer experiment)
 - 20th Dec. 1995 ~ 9th Feb. 1996 (winter experiment)

Observing System Experiment of CSR using the JRA-55 data assimilation system

- Impact for precipitable water
 - Underestimate on convective area in both season is reduced by CSR assimilation.
 - Overestimate on the area between ITCZ and SPCZ in both season is enhanced.
- Impact for BT of HIRS WV channel wave length band
 - Large RMSD on convective area in both season is reduced.
- Impact for extended forecast score
 - Neutral in summer experiment
 - 500hPa height on southern hemisphere is improved in winter experiment.

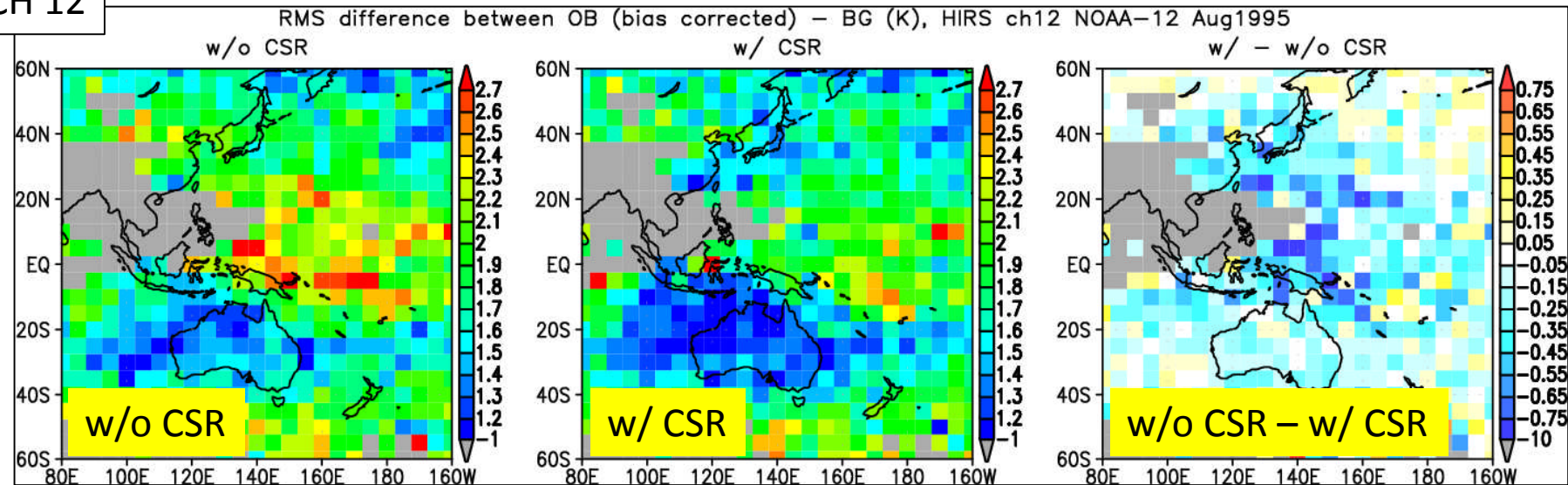
precipitable water comparison (analysis v.s. SSM/I v6)

Summer experiment (Aug. 1995)

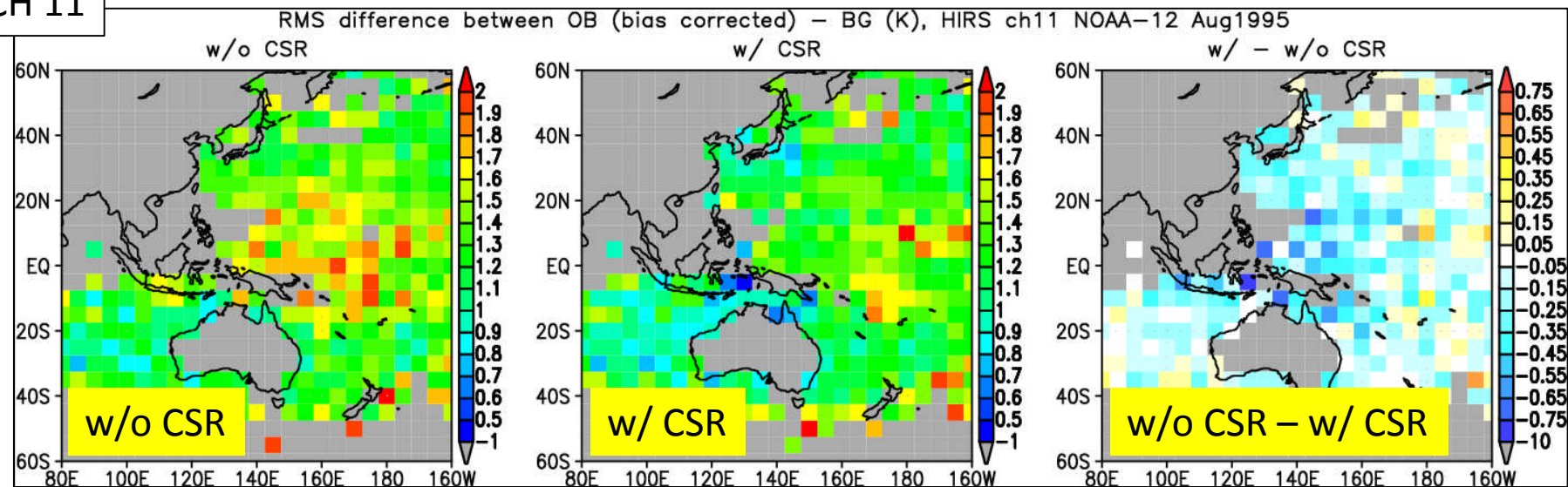


RMS of HIRS WV channel BT (w/o CSR analysis v.s. w/ CSR analysis) Summer experiment (Aug. 1995)

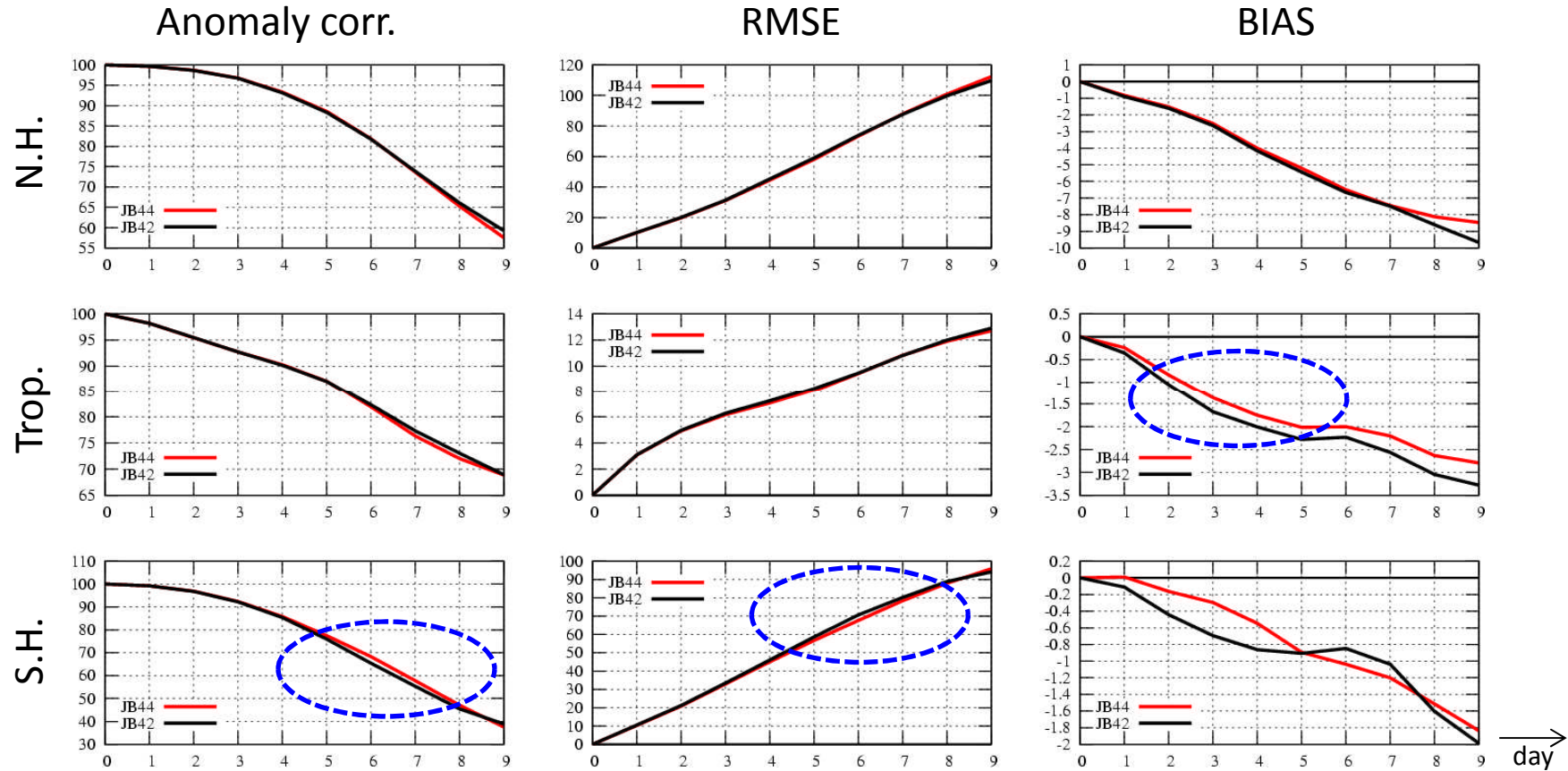
CH 12



CH 11



extended forecast score [500hPa height] Winter experiment (Jan. 1996)



without CSR, with CSR

Summary

- 15-year CSR dataset of GMS-5, GOES-9, MTSAT-1R and MTSAT-2 was produced and provided to the re-analysis community
- Positive impact of GMS-5 CSR dataset is seen in OSE on ahead and effectivity of the dataset is confirmed.