CIMP5 Climate Model Simulations: Preliminary Assessment

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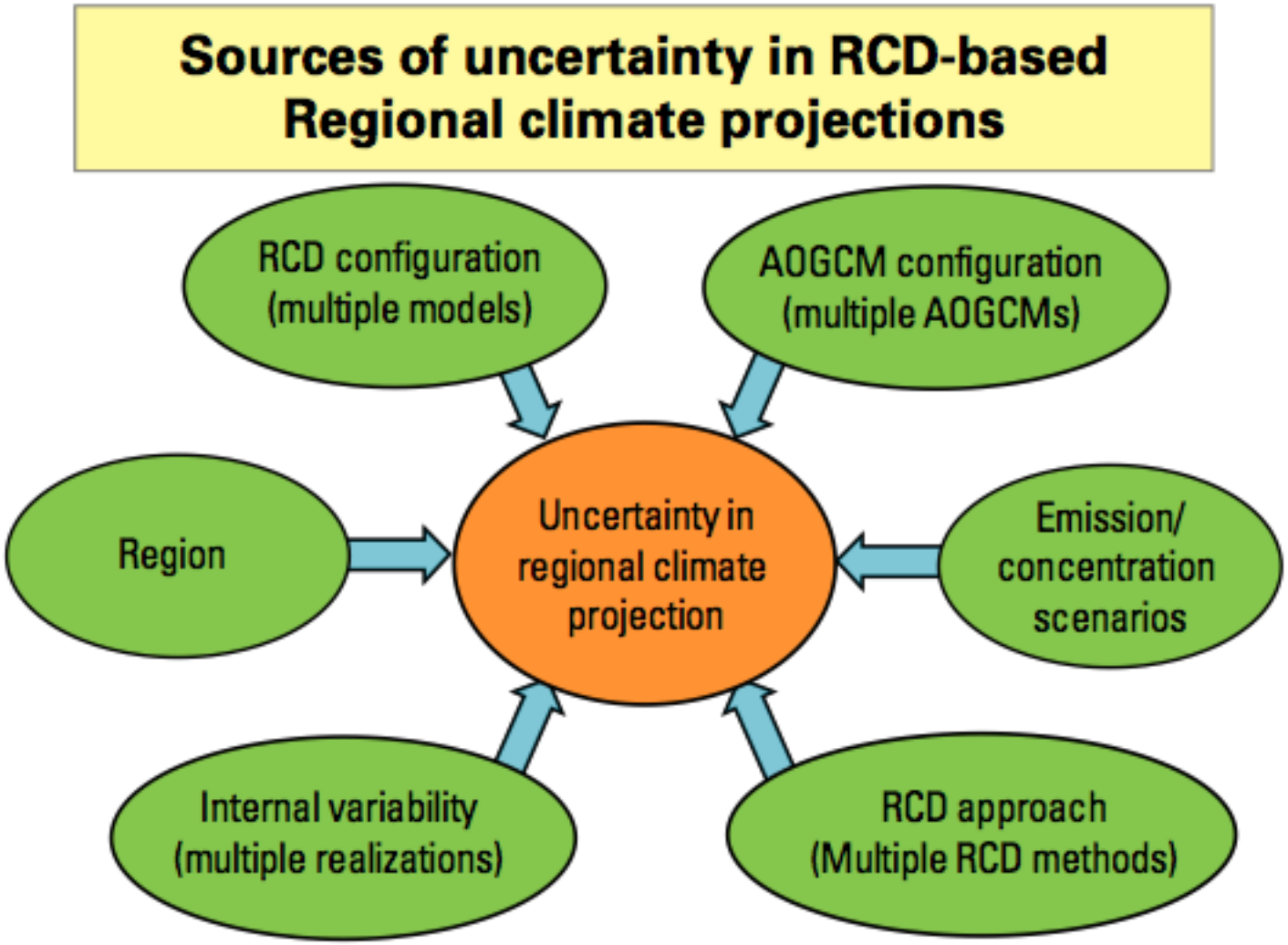


Giorgi et al. (2009)

Which GCMs?

Which RCMs?

What domain?

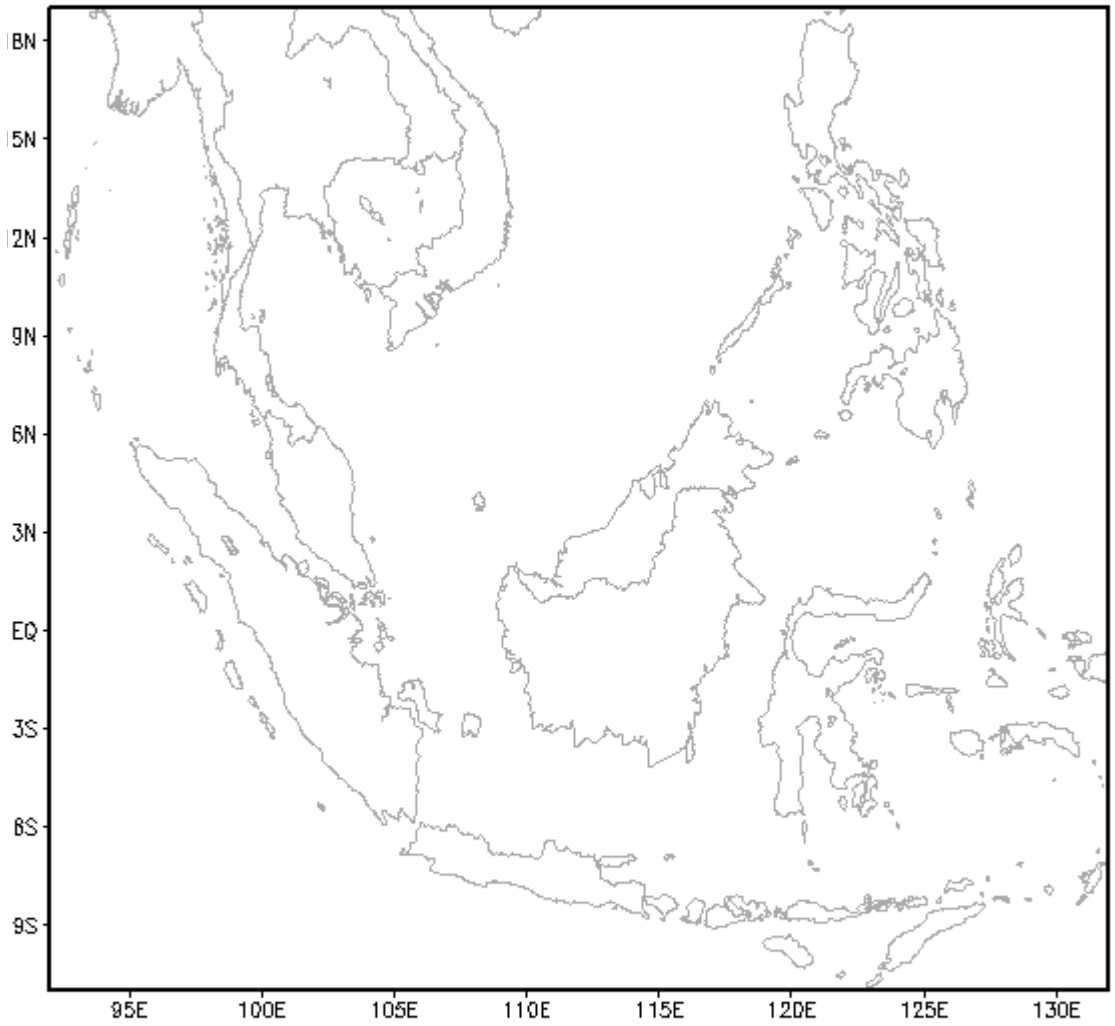
Which RCP?

How should we jointly carry out the project?

Model Selection

- 10 out of 35 models from 5th Coupled Model Intercomparison Project (CMIP5)
- Availability of coverage period (1979-2005)
- Their representation of the 3 Representative Concentration Pathways (RCP2.6, RCP4.5, and RCP8.5)

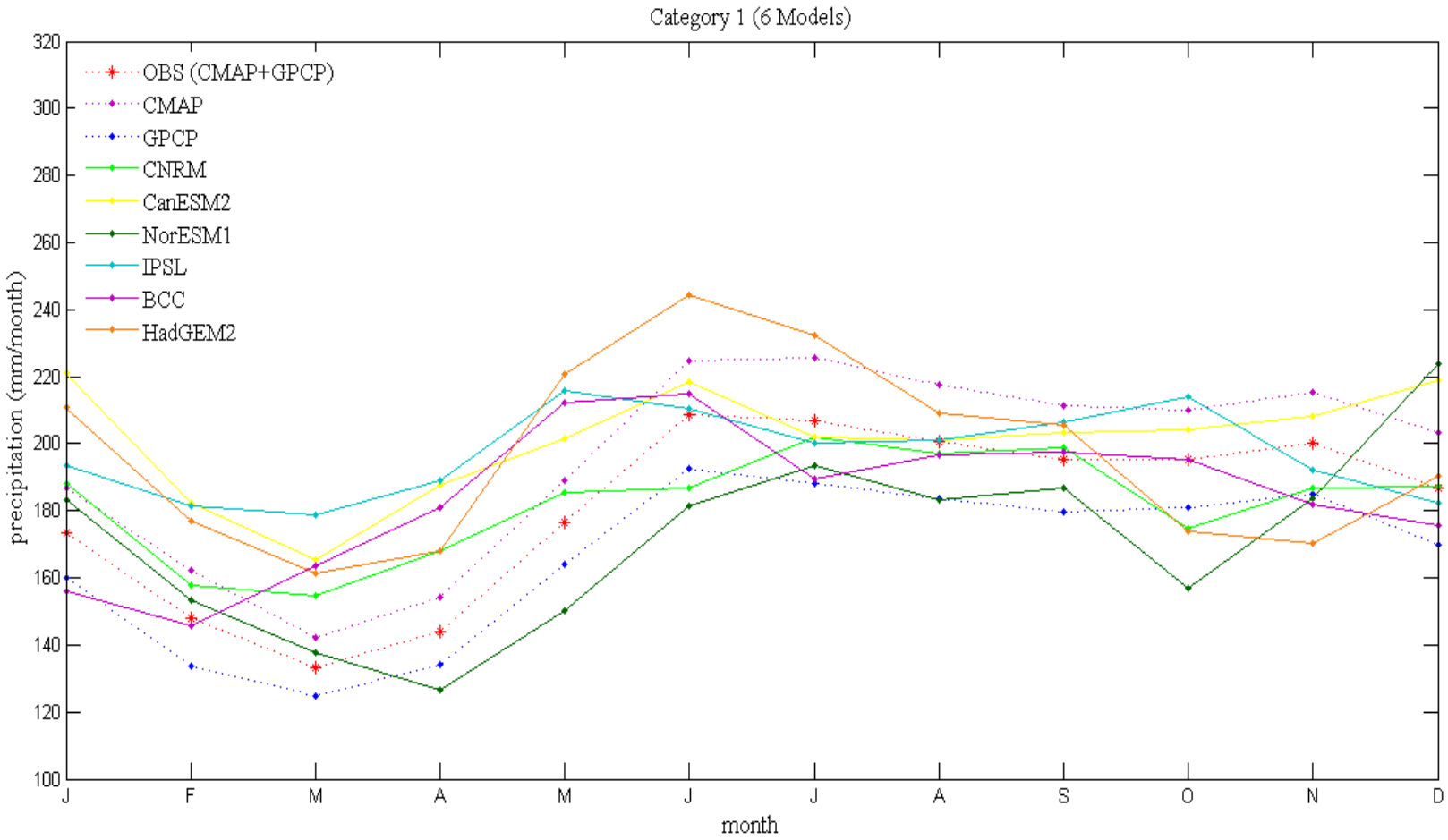
MODELS	INSTITUTION	ATM RESOLUTION
1. CNRM-CM5	Centre National de Recherches Meteorologiques, France	1.389×1.4063
2. CSIRO-Mk3-6-0	Commonwealth Scientific and Industrial Research Organization and the Queensland Climate Change Centre of Excellence, Australia	1.8497×1.875
3. CanESM2	Canadian Centre for Climate Modeling and Analysis	2.7673×2.8125
4. HadGEM2-ES	Met Office Hadley Centre, UK	1.25×1.875
5. MIROC5	Atmosphere and Ocean Research Institute (The University of Tokyo), Japan	1.389×1.4063
6. MPI-ESM-LR	Max Planck Institute for Meteorology, Germany	1.8497×1.875
7. MRI-CGCM3	Meteorological Research Institute, Japan	1.1121×1.125
8. NorESM1-M	Norwegian Climate Centre	1.8947×2.5
9. bcc-csm1-1	Beijing Climate Center, China	2.7673×2.8125
10. model ipsl-cm5a-mr	Institute Pierre-Simon Laplace, France	1.2676×2.5



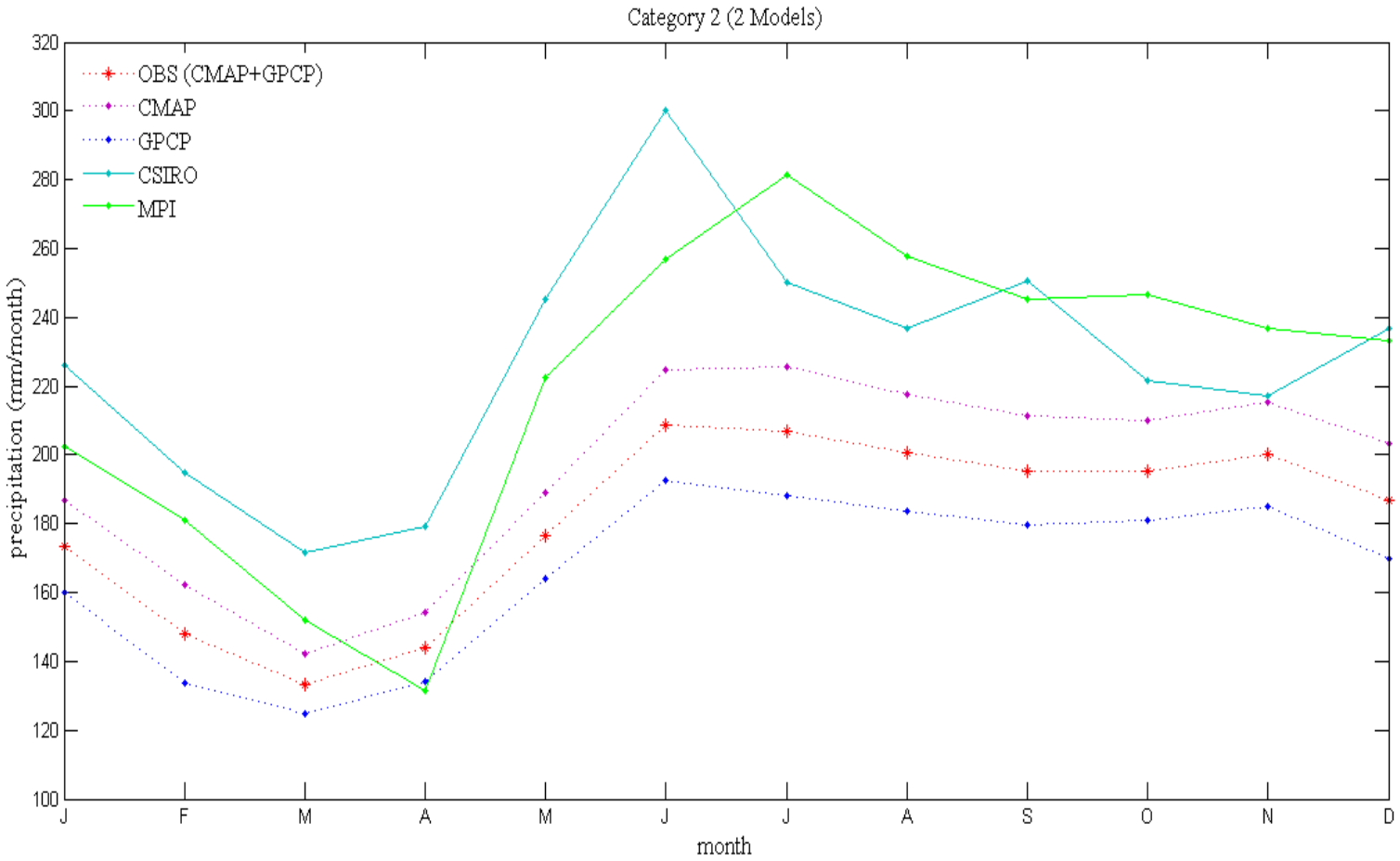
Longitude : 92°E -132°E
Latitude : 11° S-19°N

Period: Jan1979-Nov 2005

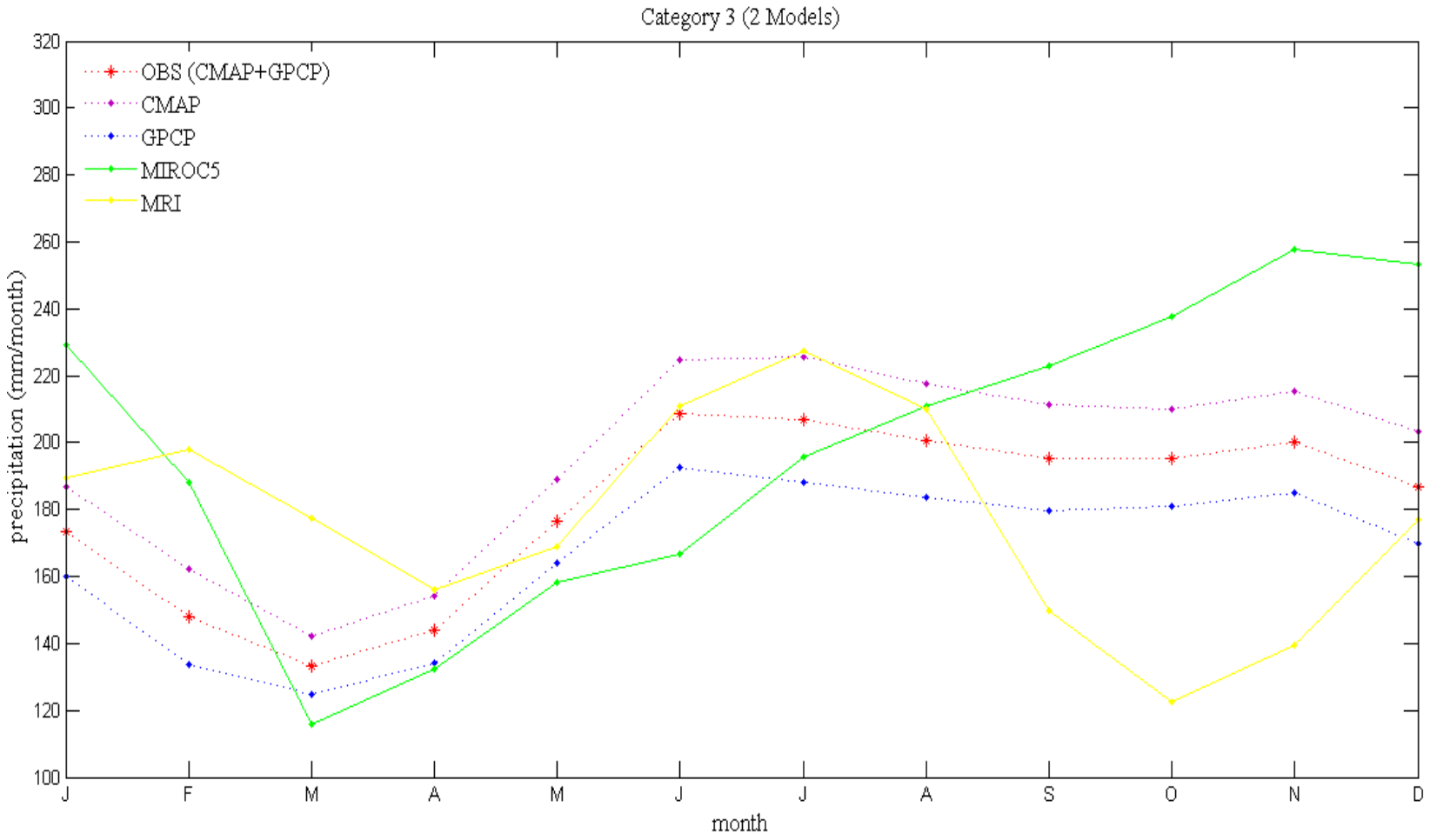
Annual Cycle (Category I)



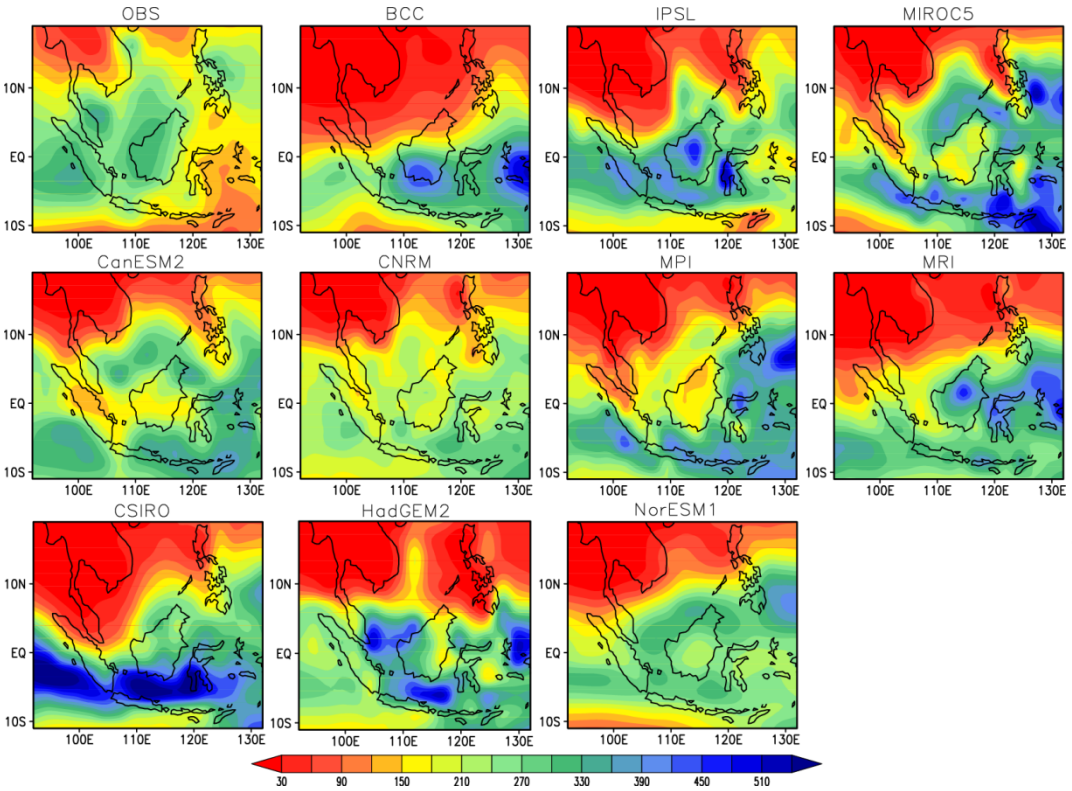
Annual Cycle (Category 2)



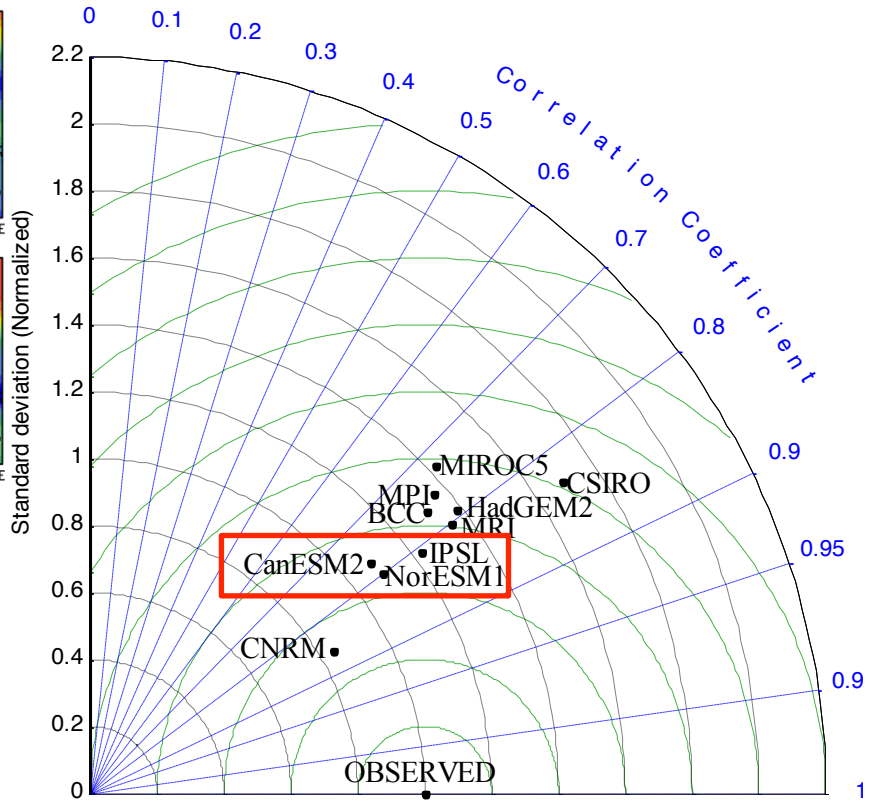
Annual Cycle (Category 3)



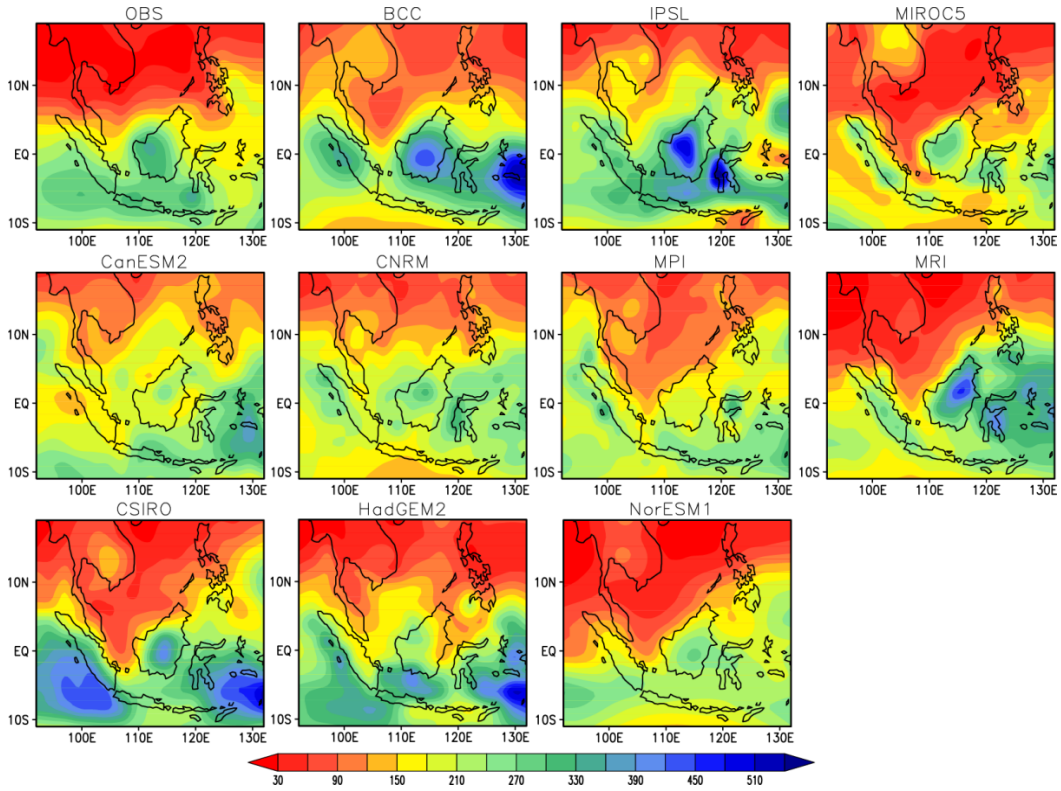
Winter



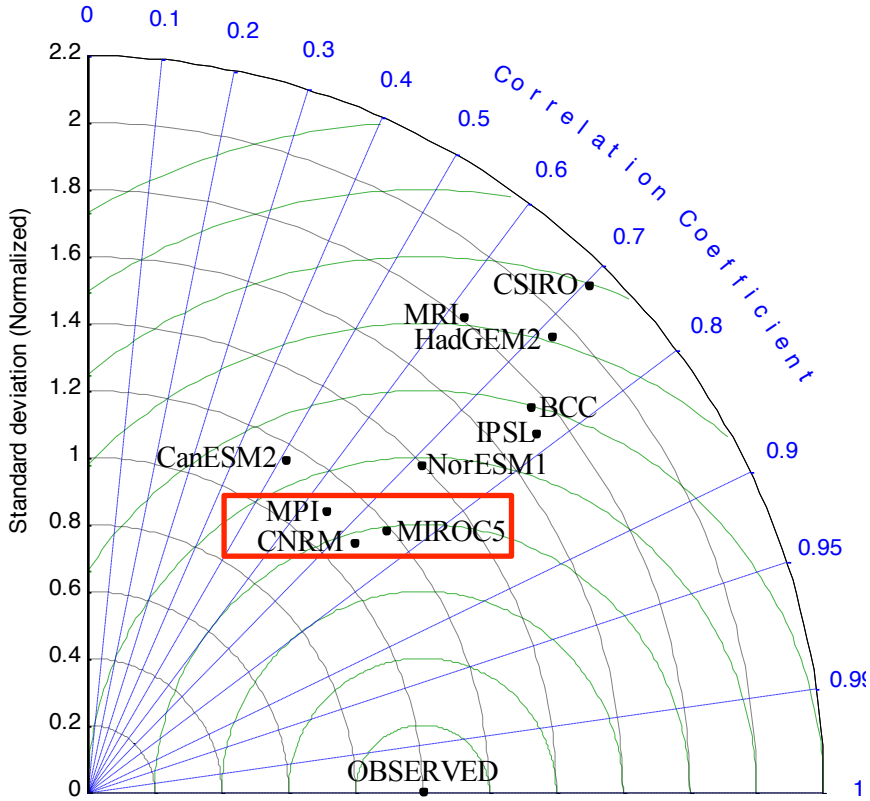
A: Taylor Diagram for winter precipitation



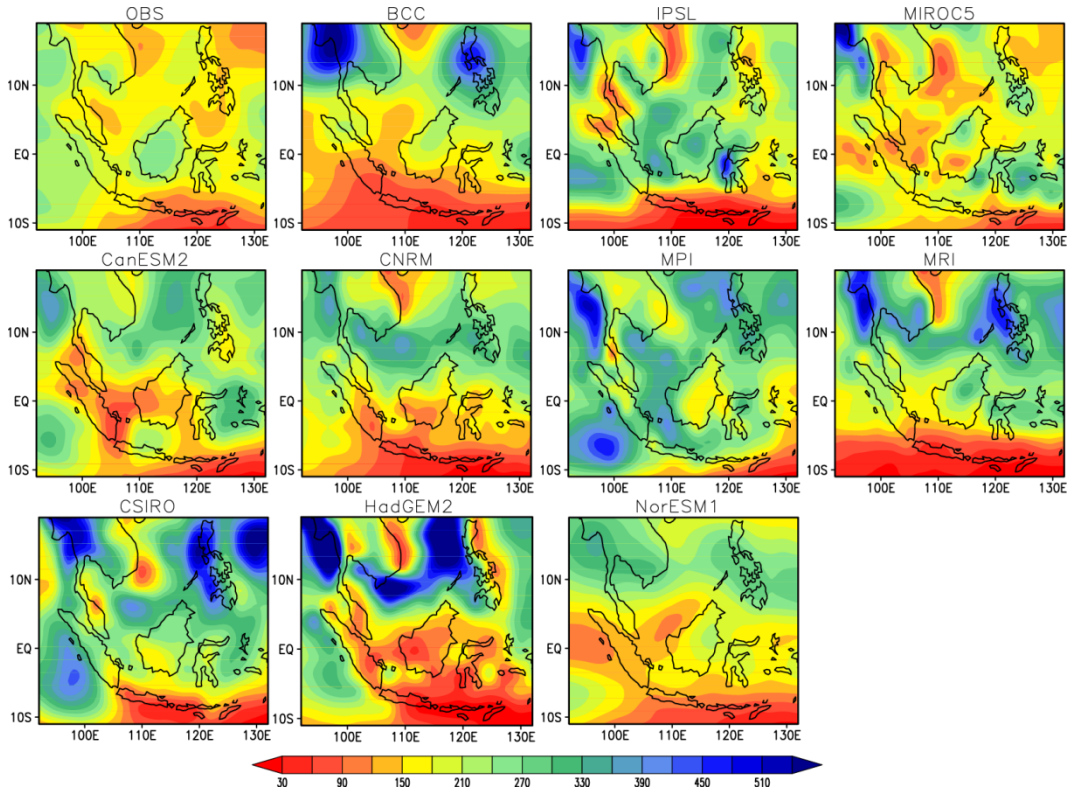
SPRING



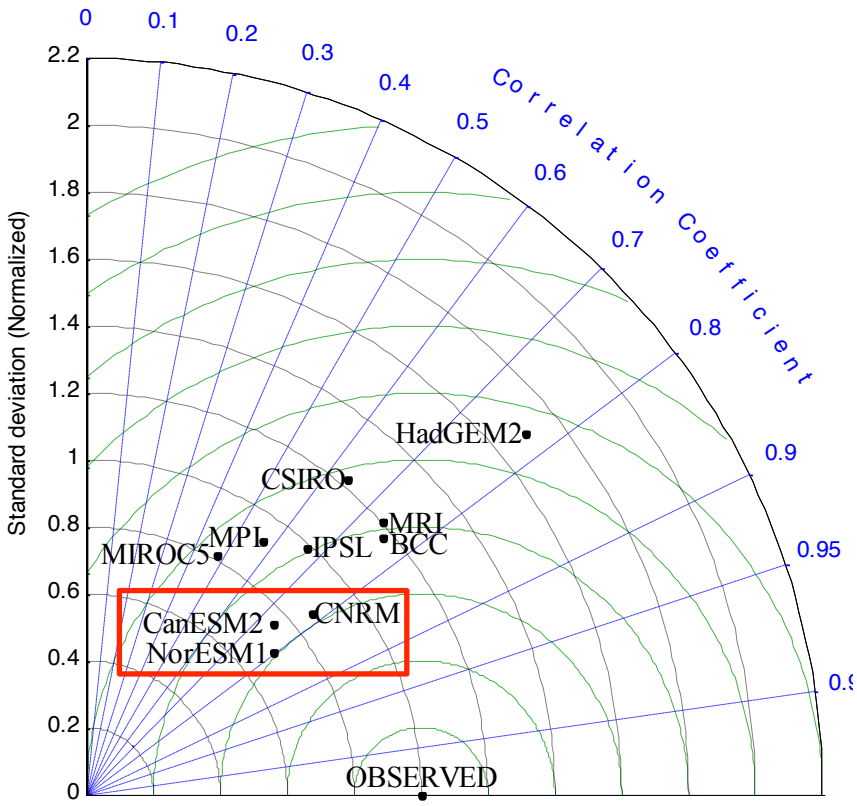
B: Taylor Diagram for spring precipitation



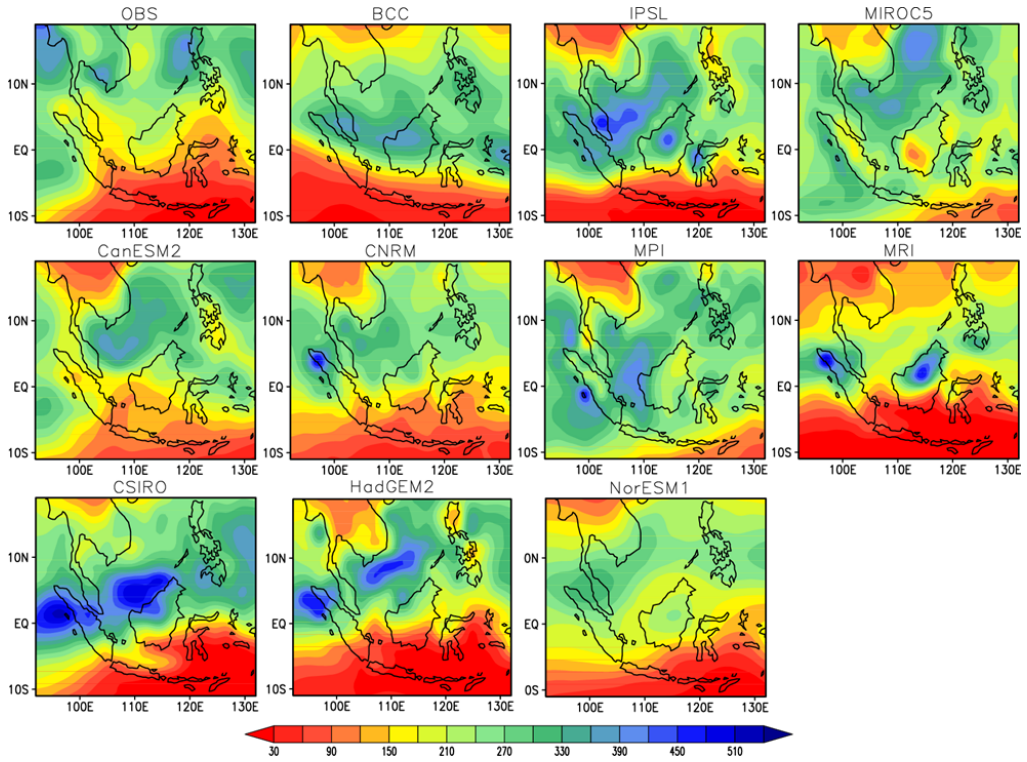
SUMMER



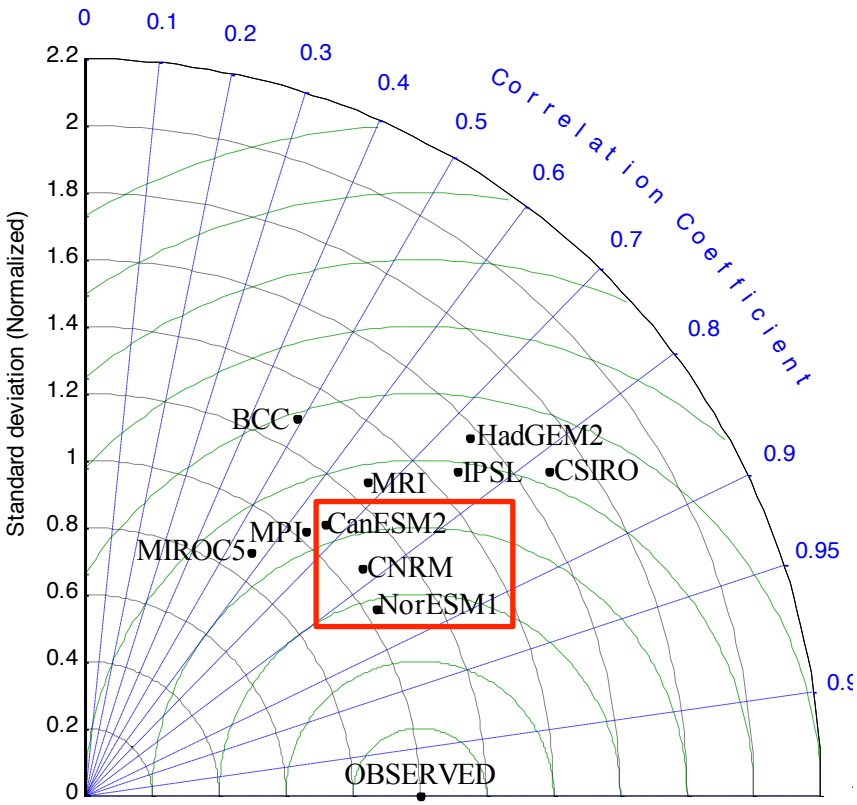
C: Taylor Diagram for summer precipitation



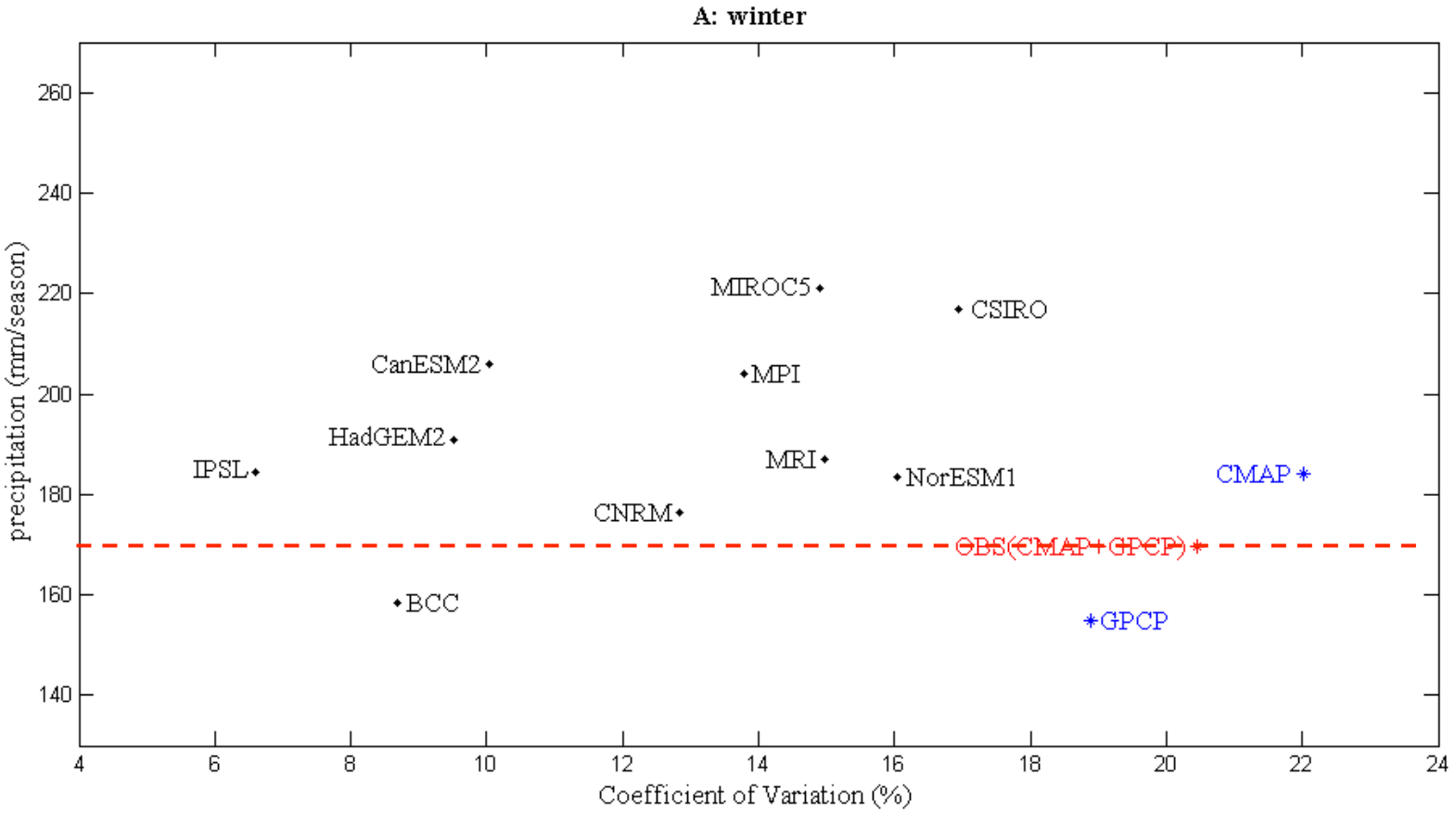
AUTUMN



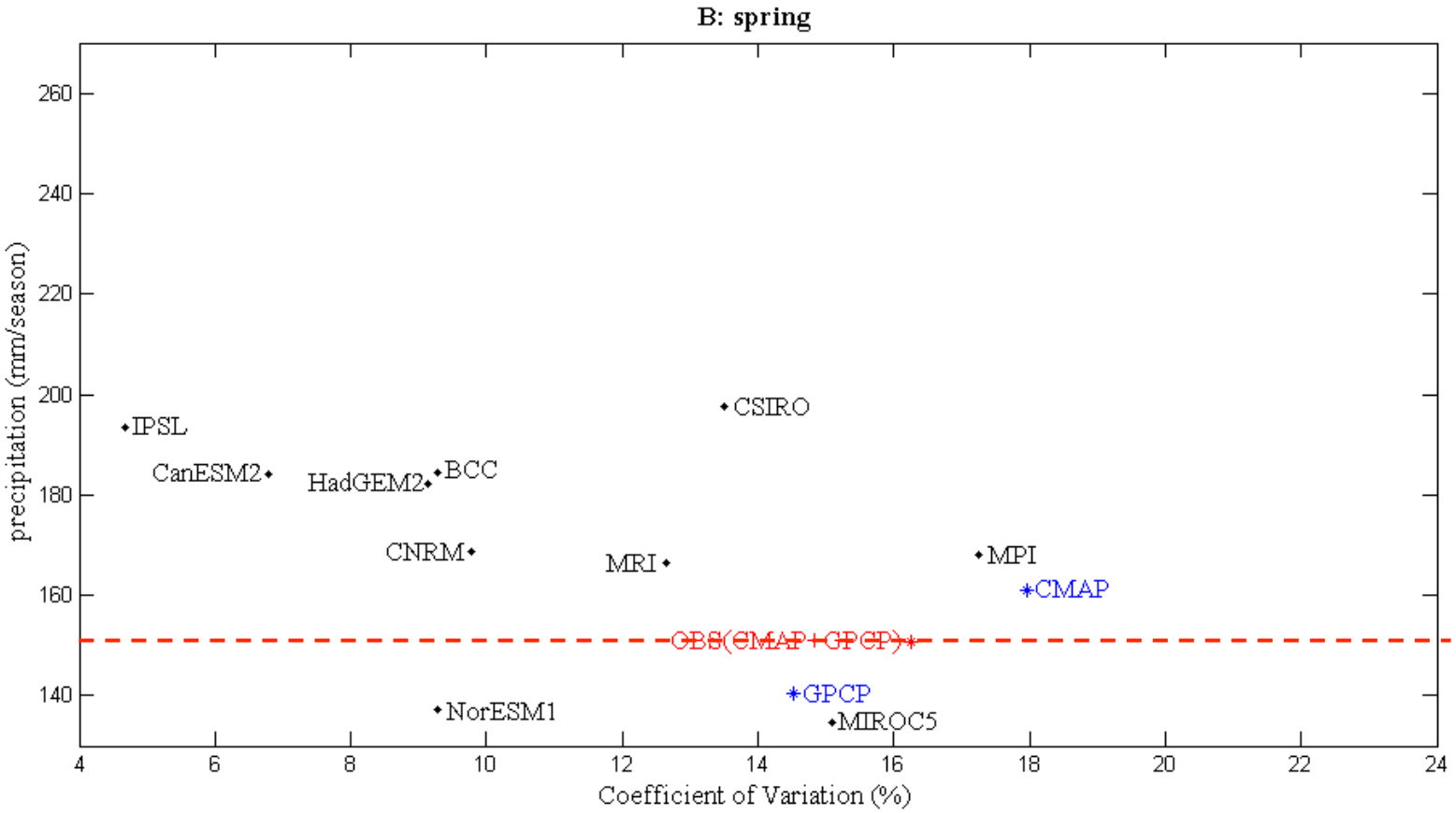
D: Taylor Diagram for autumn precipitation



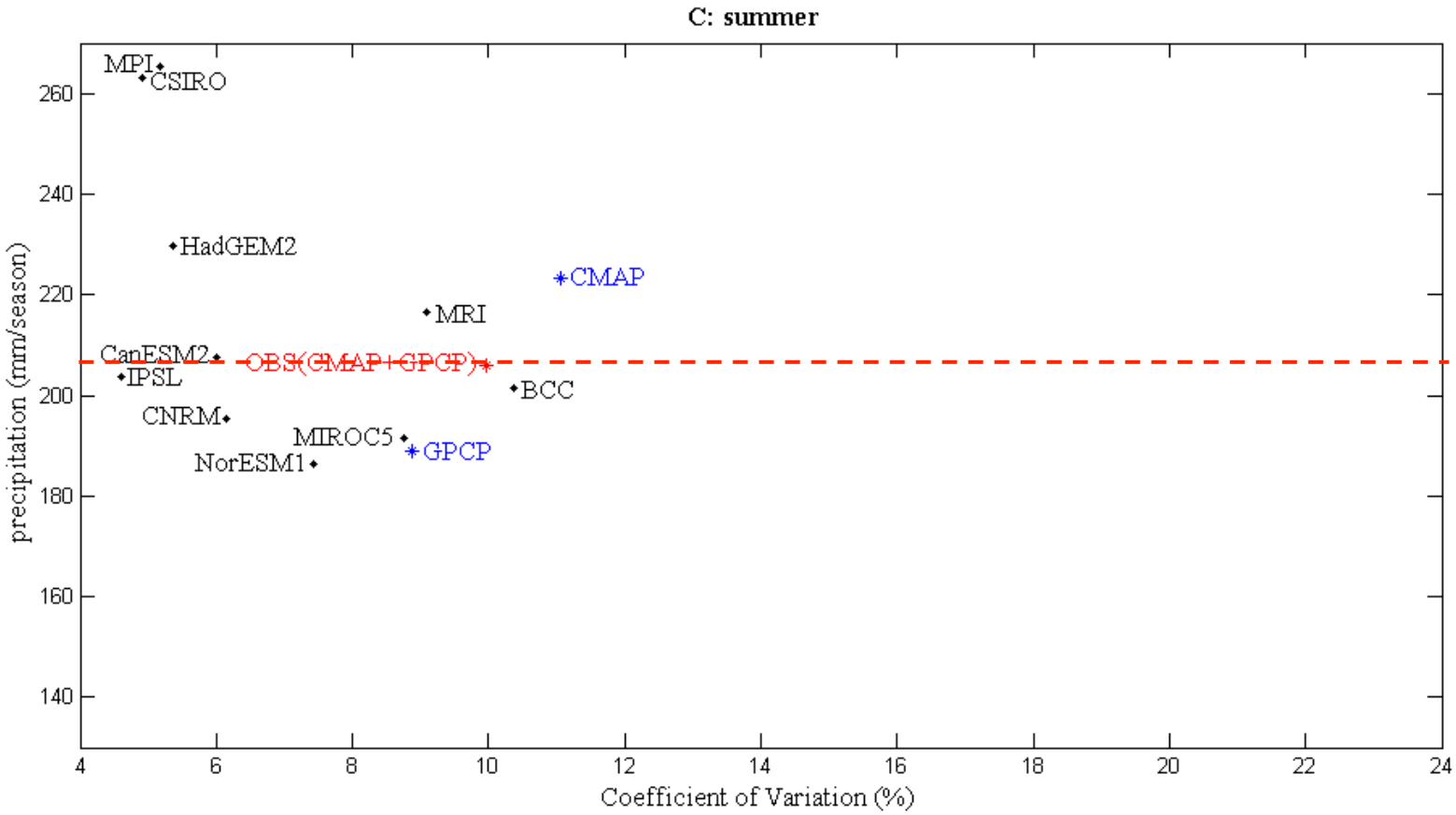
COEFFICIENT OF VARIATION: WINTER



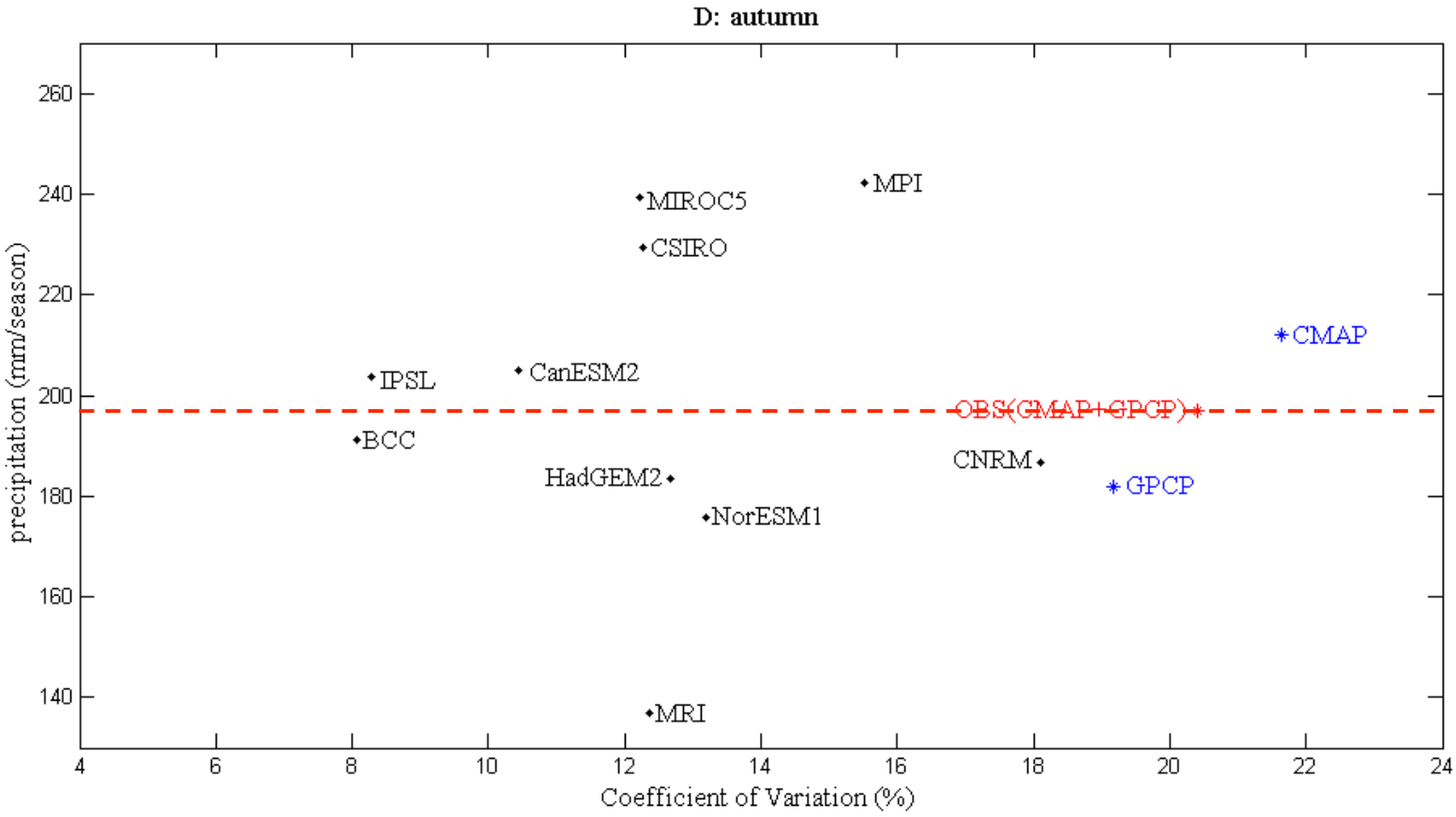
COEFFICIENT OF VARIATION: SPRING



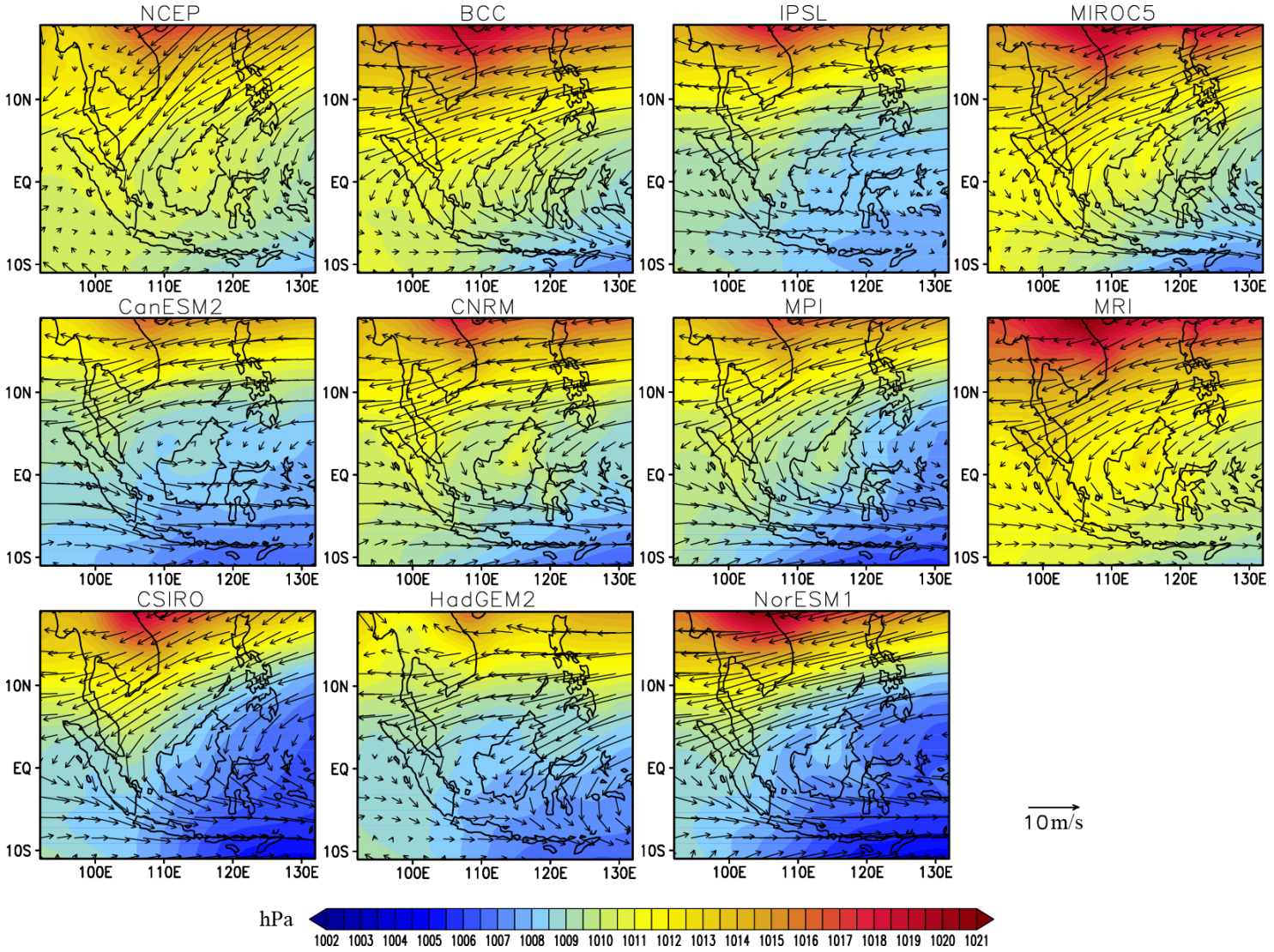
COEFFICIENT OF VARIATION: SUMMER



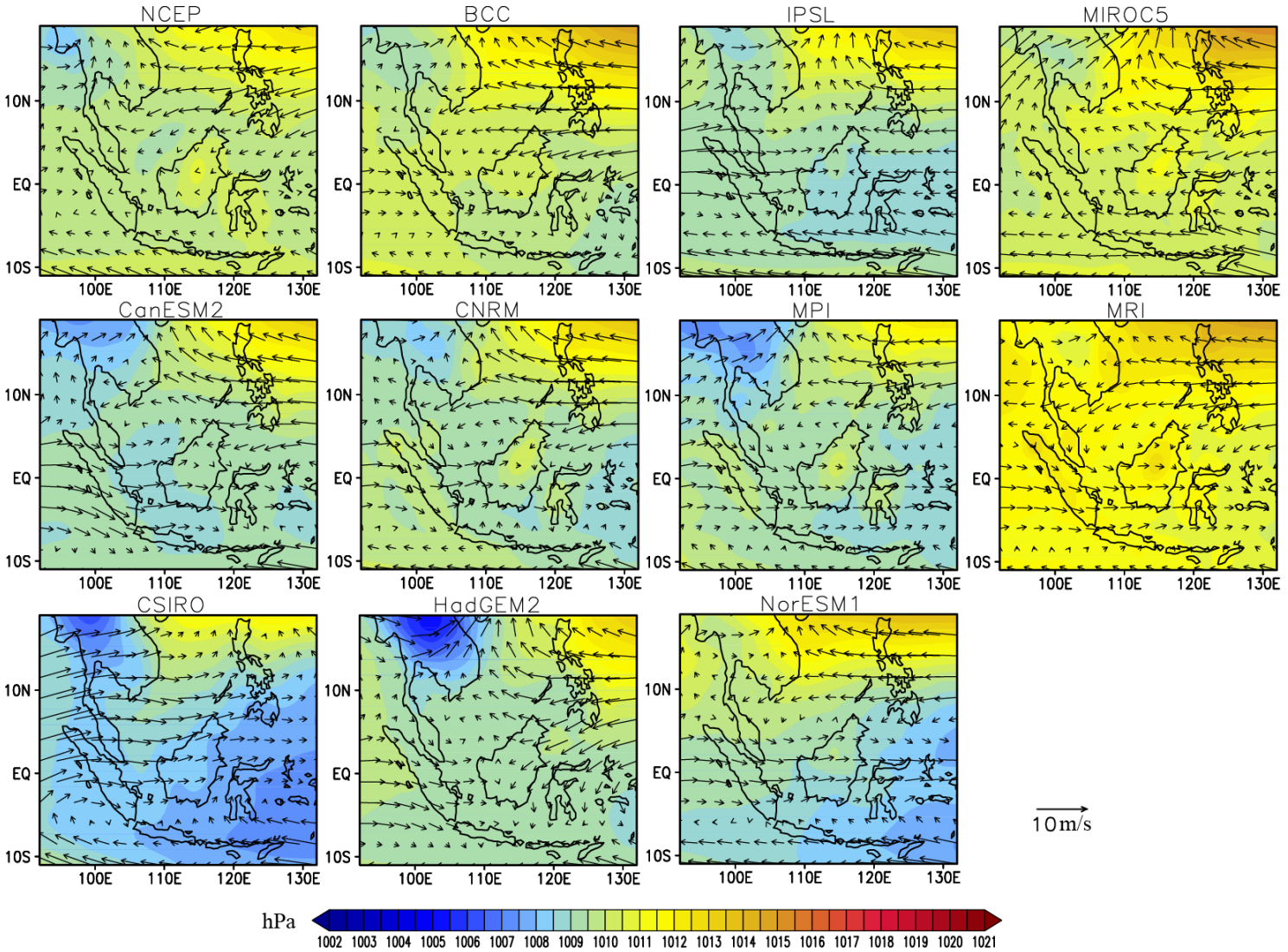
COEFFICIENT OF VARIATION: AUTUMN



ATMOSPHERIC CIRCULATION: WINTER



ATMOSPHERIC CIRCULATION: SPRING



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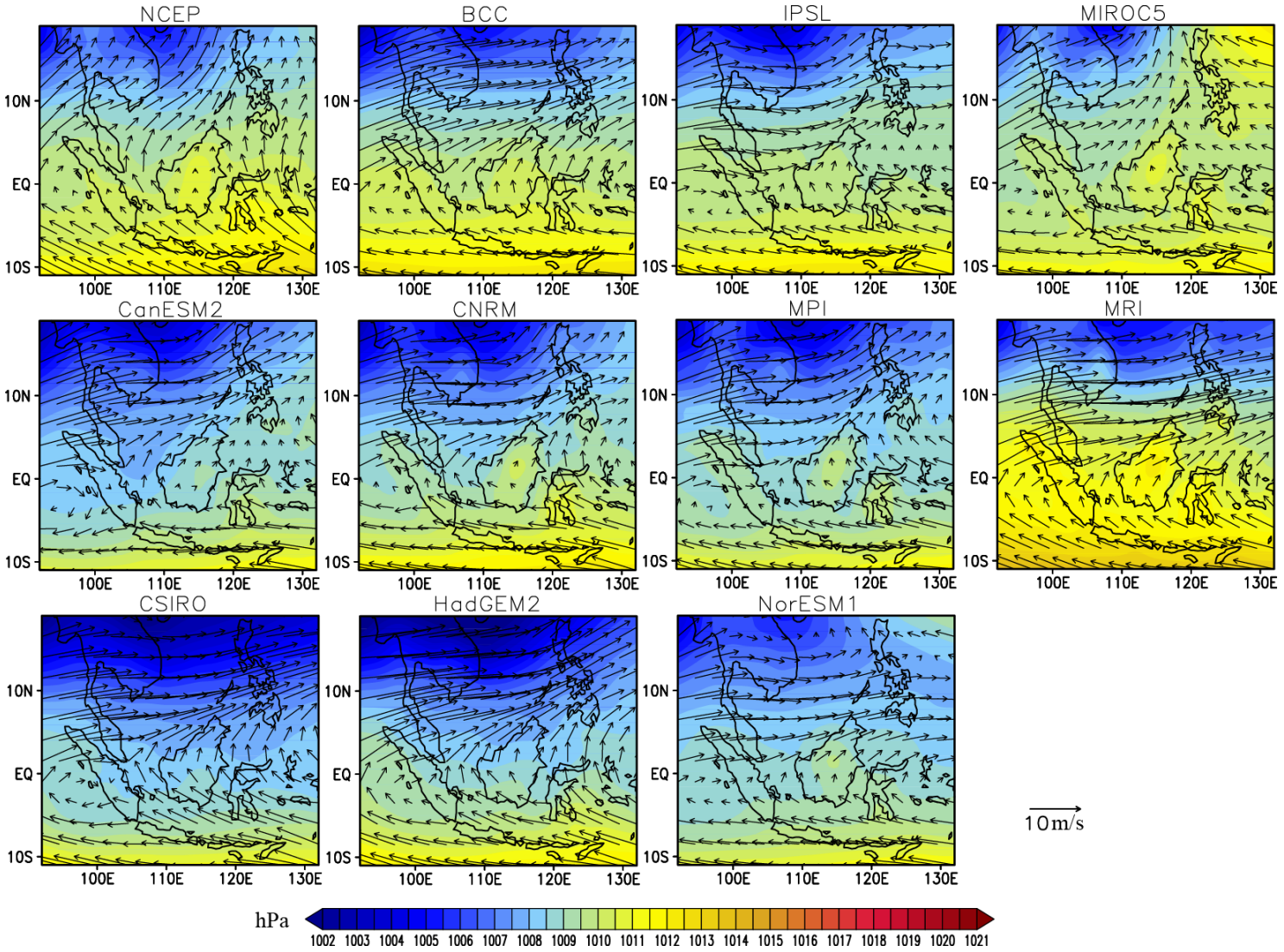

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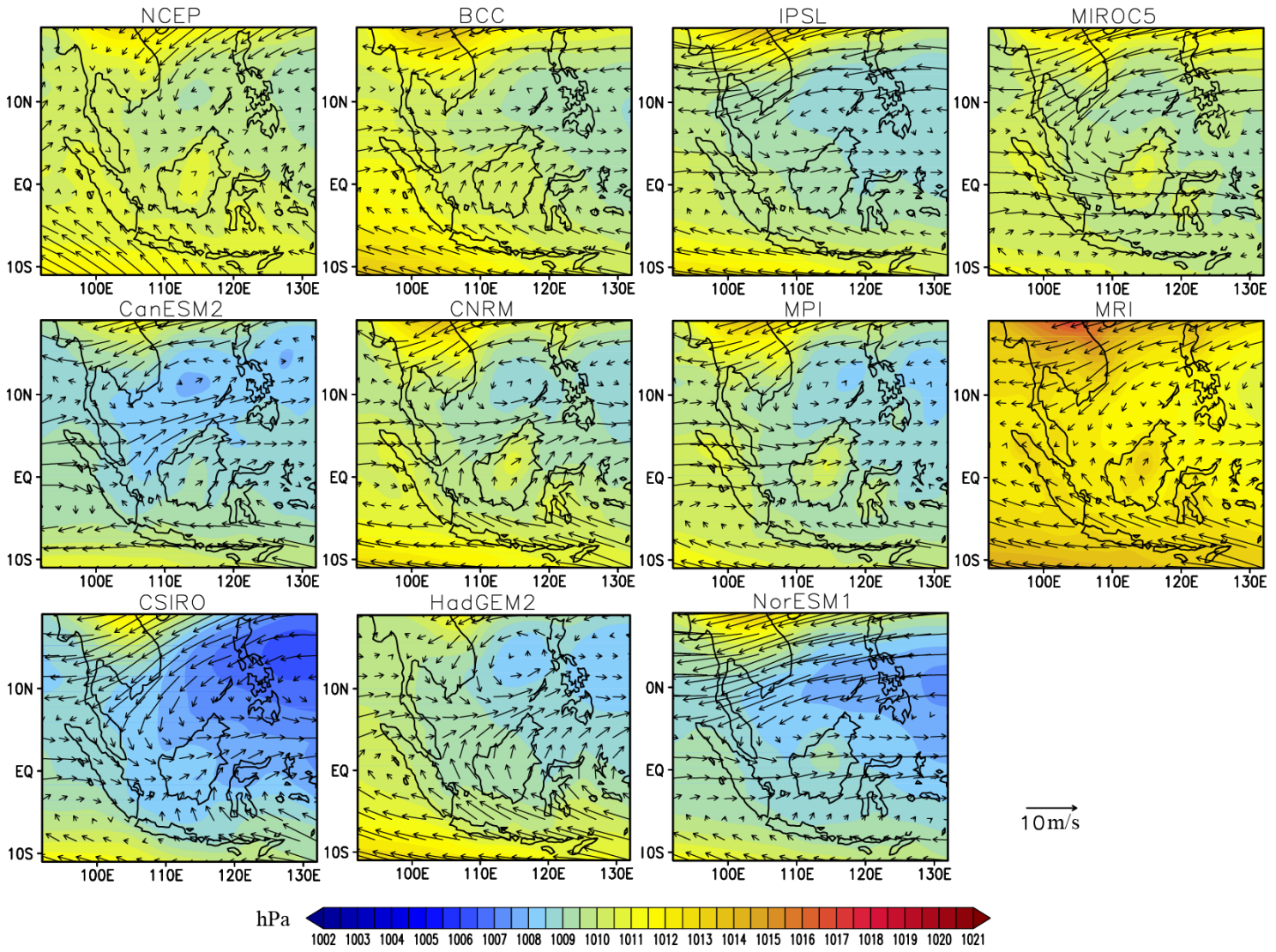
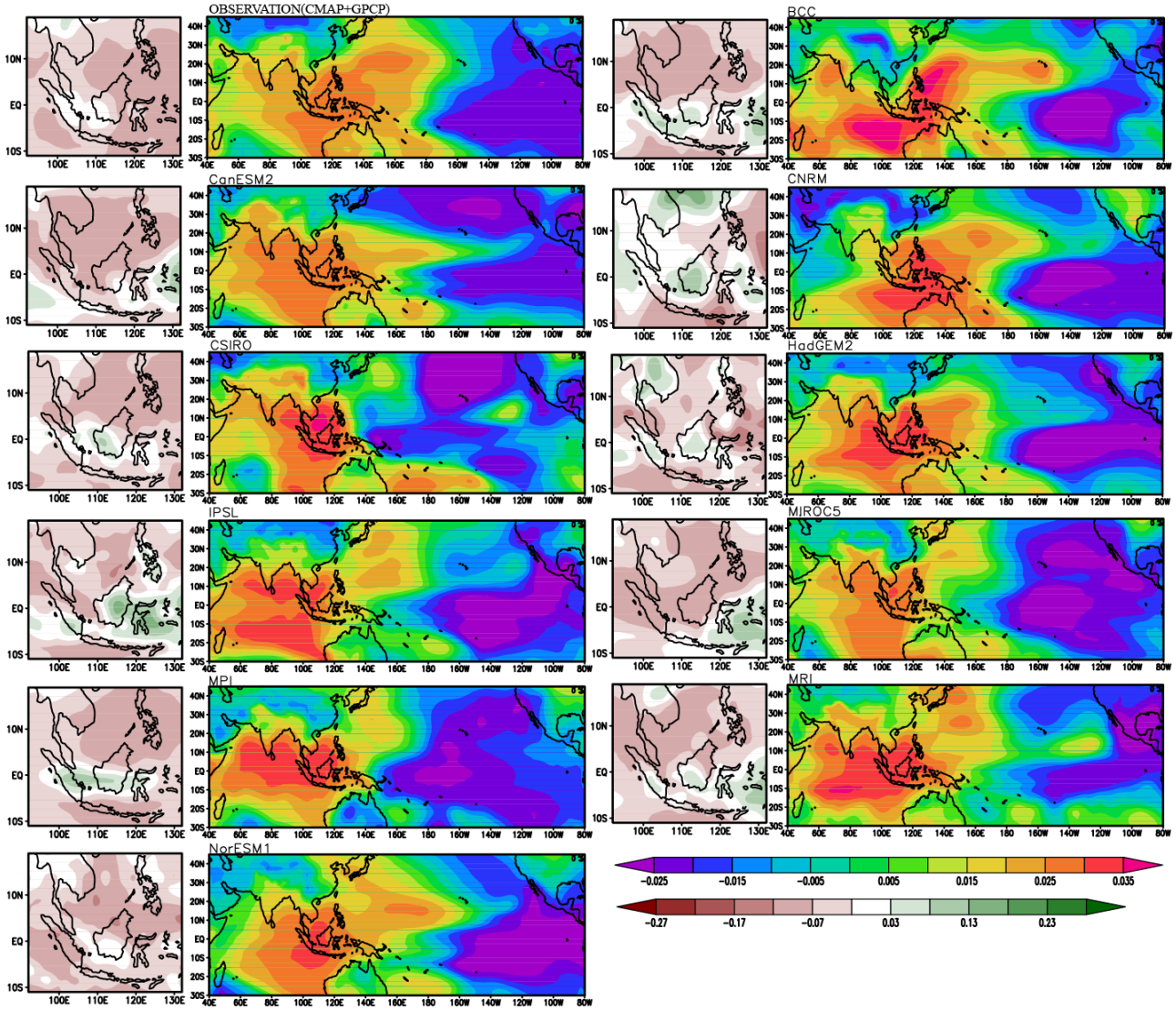
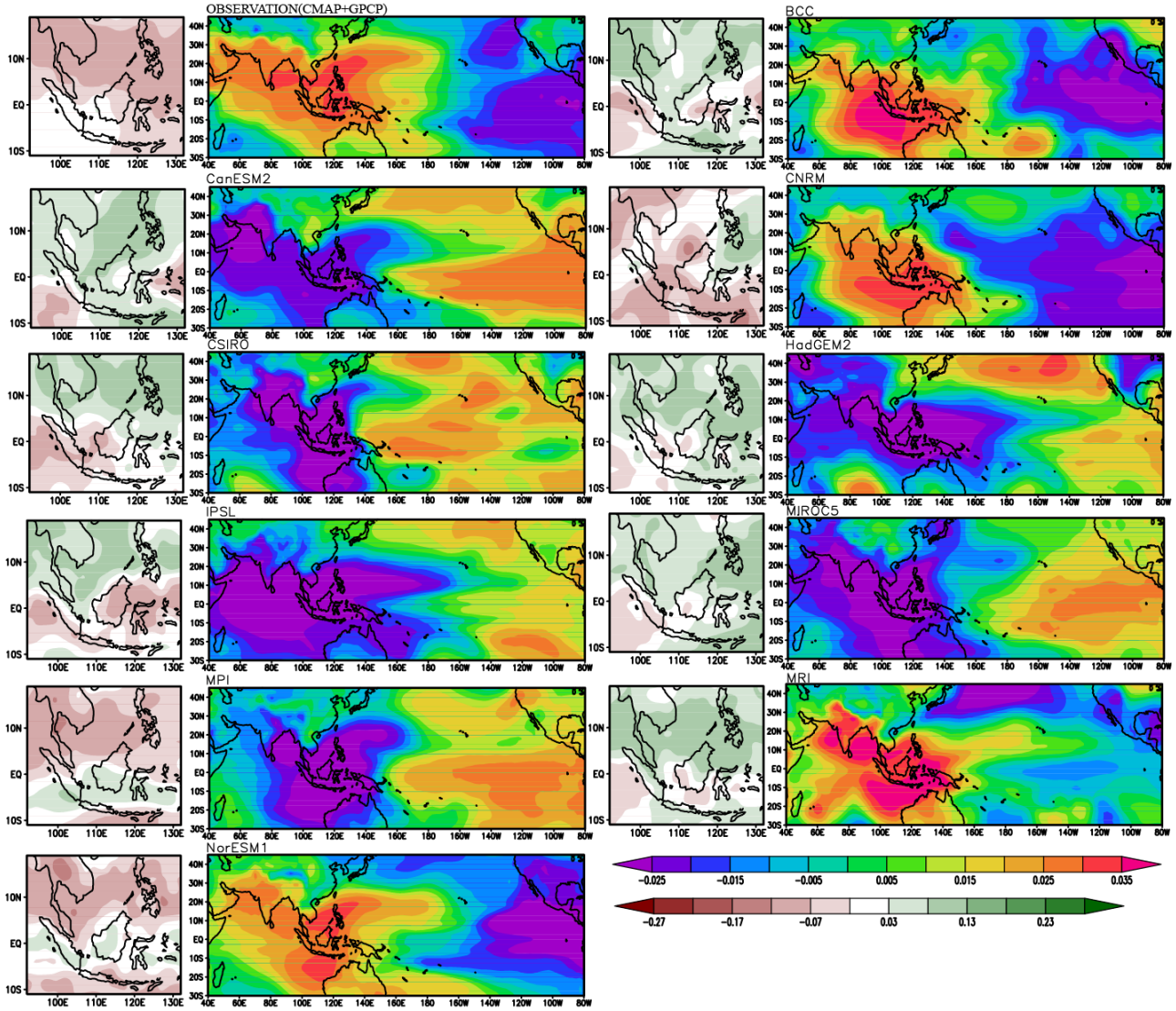


SVD 1 : WINTER


OBSERVATION(CMAP+GPCP)
BCC
CanESM2
CNRM
CSIRO
HadGEM2
IPSL
MIROC5
MPI
MRI
NorESM1
-0.025
-0.015
-0.005
0.005
0.015
0.025
0.035
-0.27
-0.17
-0.07
0.03
0.13
0.23

SVD 1 : SPRING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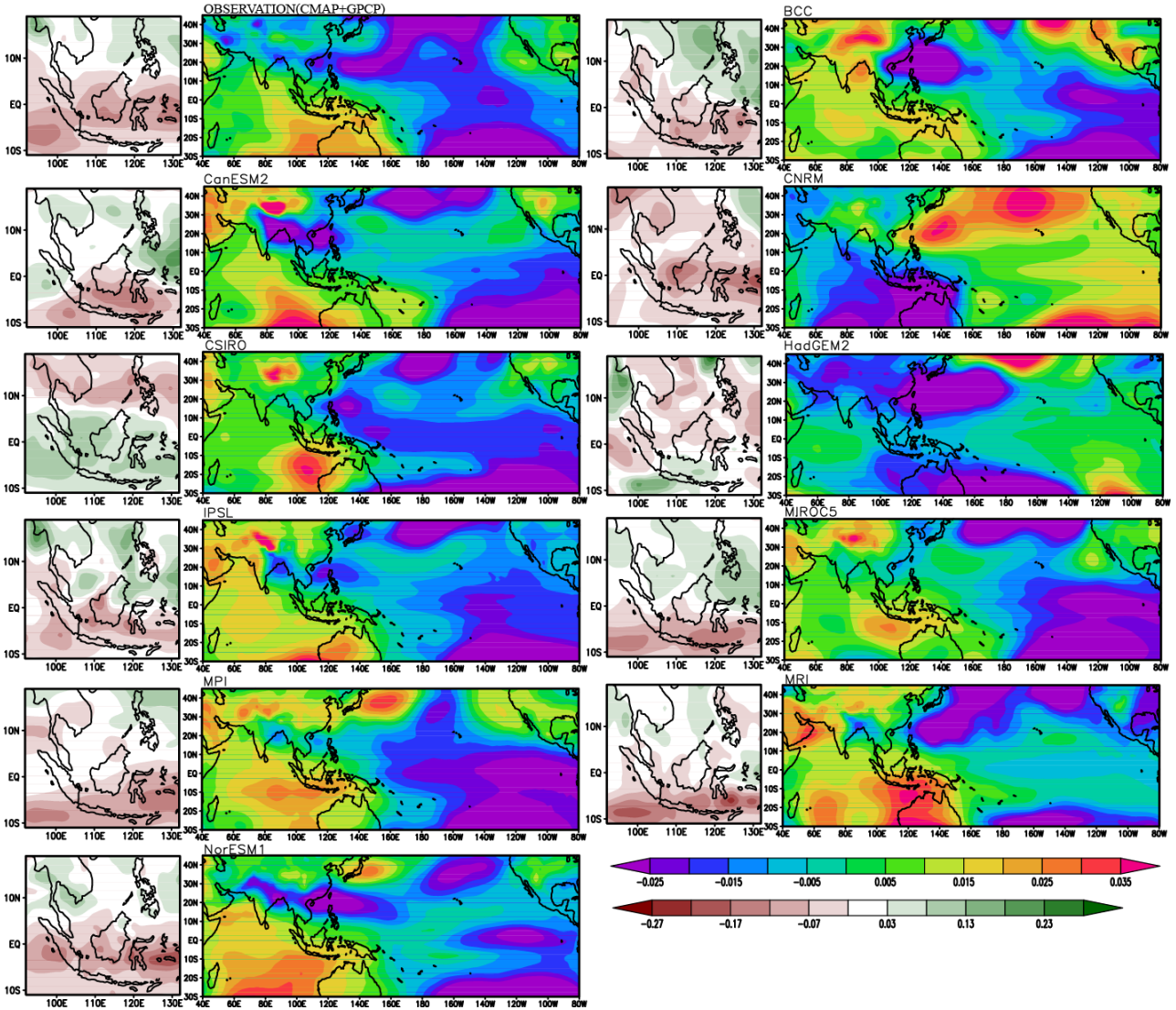
SVD 1 : SUMMER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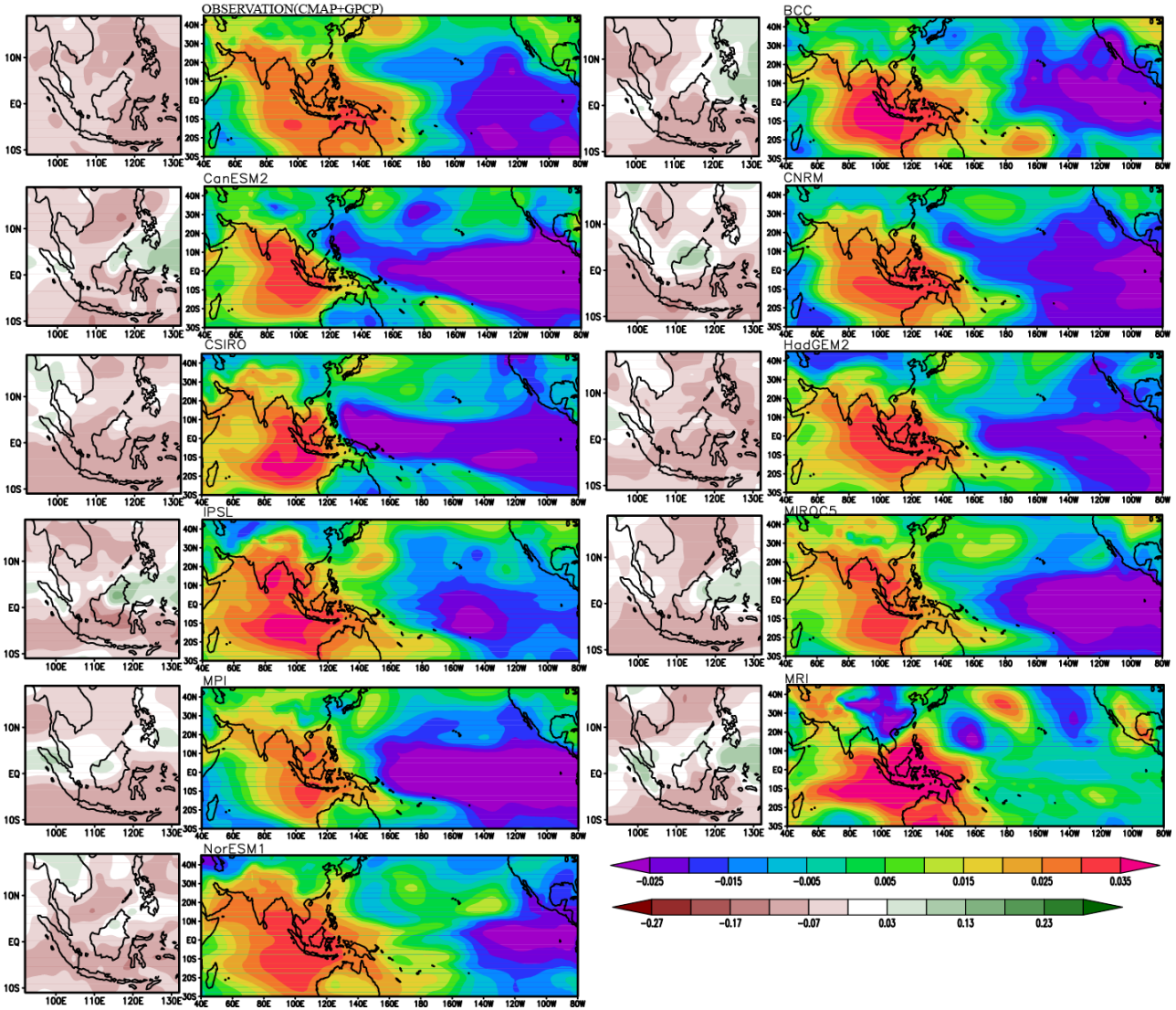
SVD 1 : AUTUMN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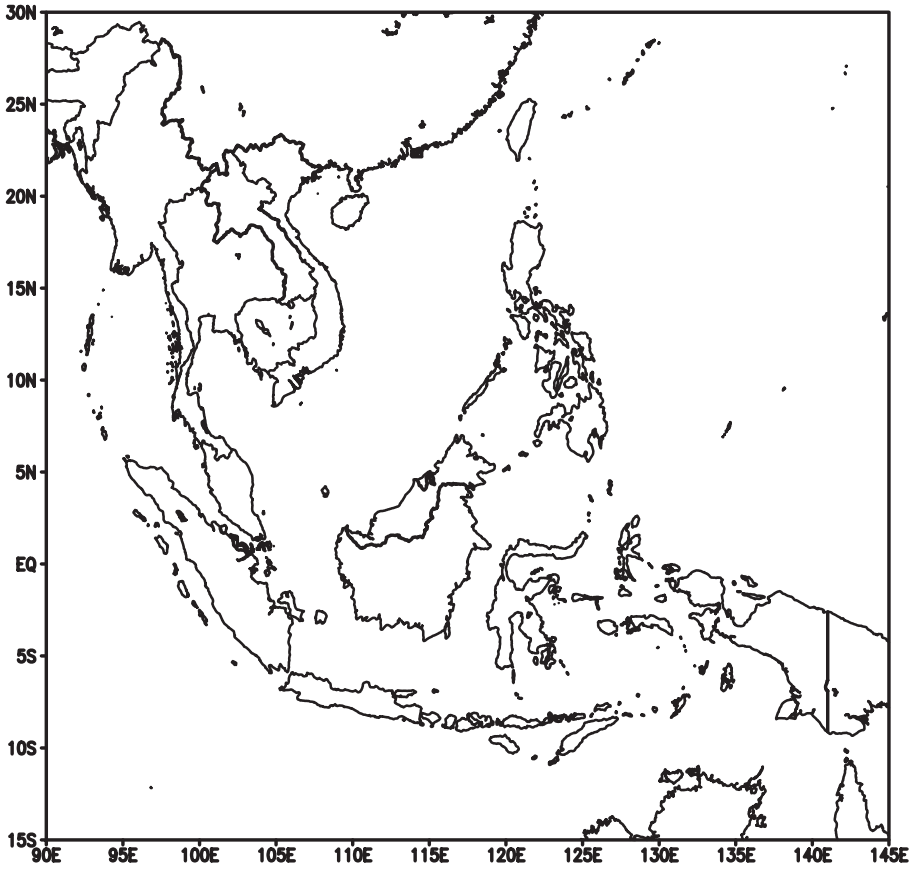
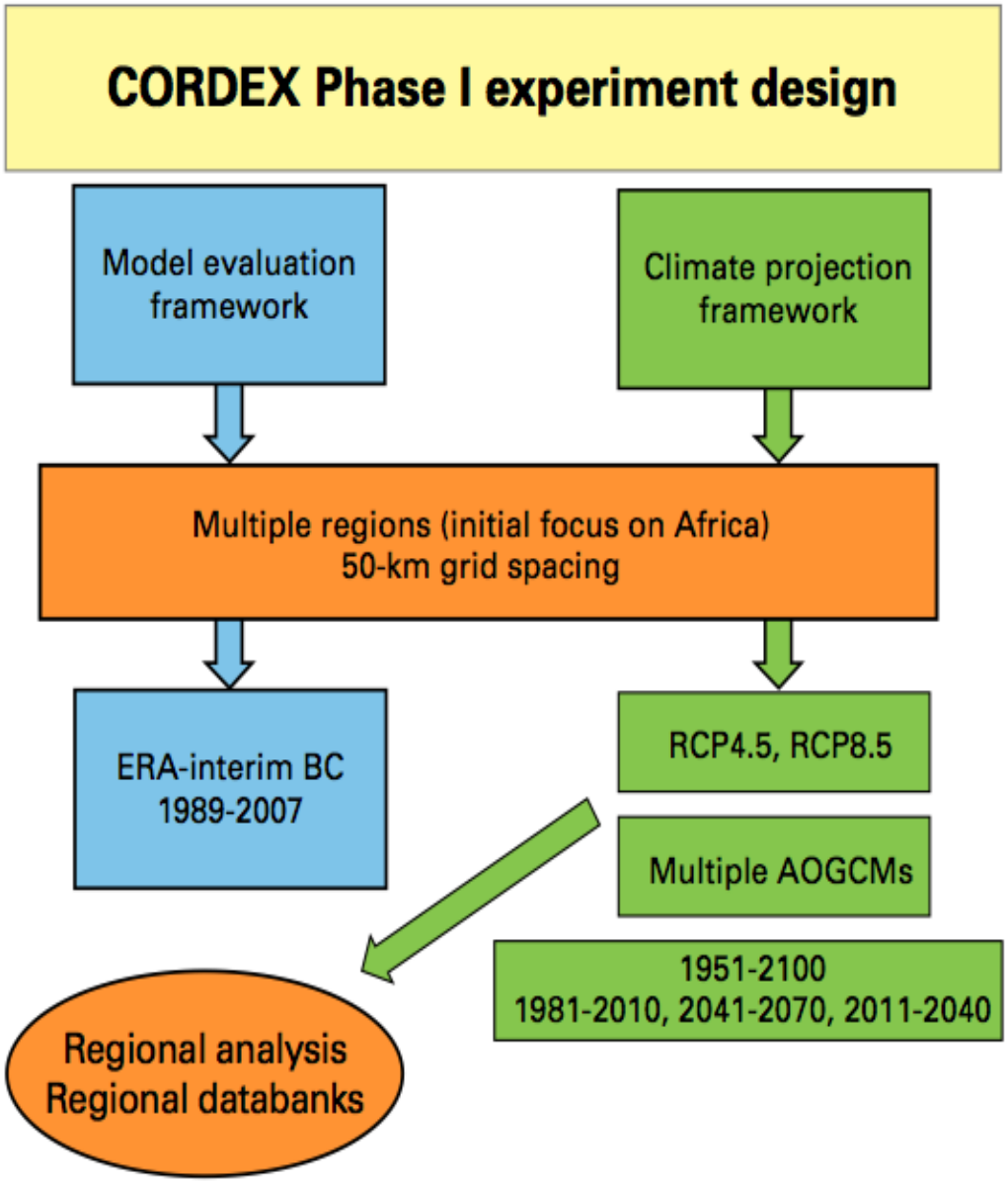
CONCLUSION

- This preliminary analysis provides an overview of 10 CMIP5 GCMs --- performances vary among models
- Group I: CNRM, CanESM2, NorESM1, IPSL, BCC, HadGEM2
- We may select some of the GCMs (may be up to 5 GCMs) depending on our capability for this project from Group I or Group II

Possible Common Domain





How should we proceed?

Thank You