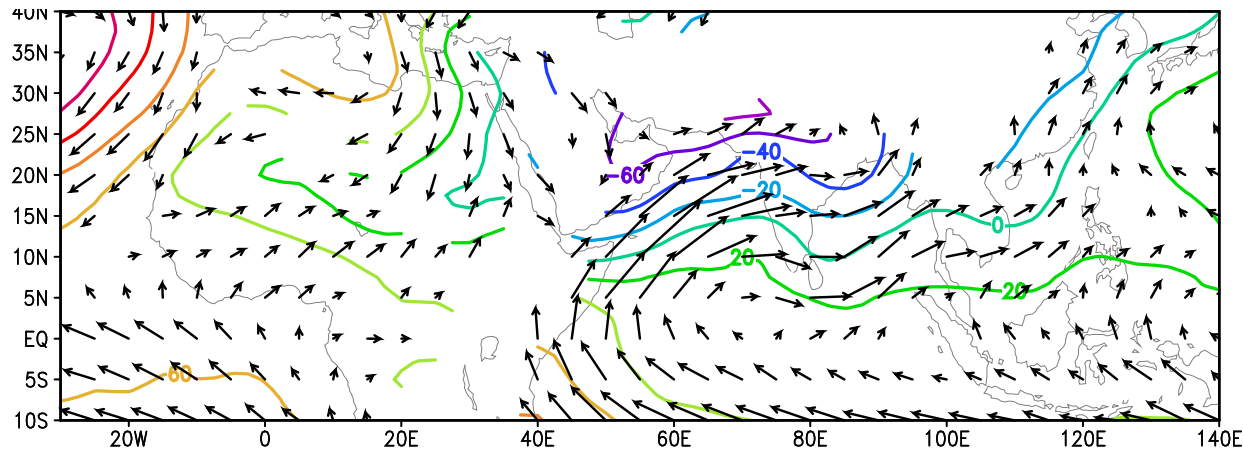
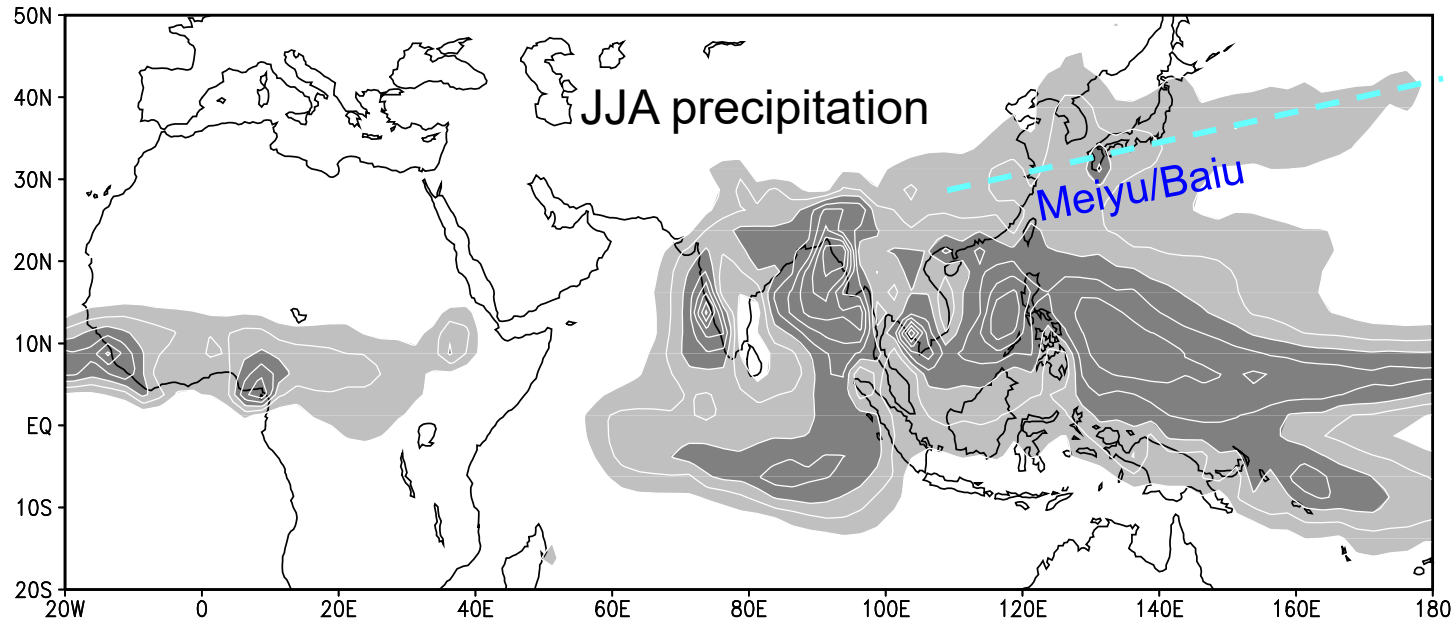
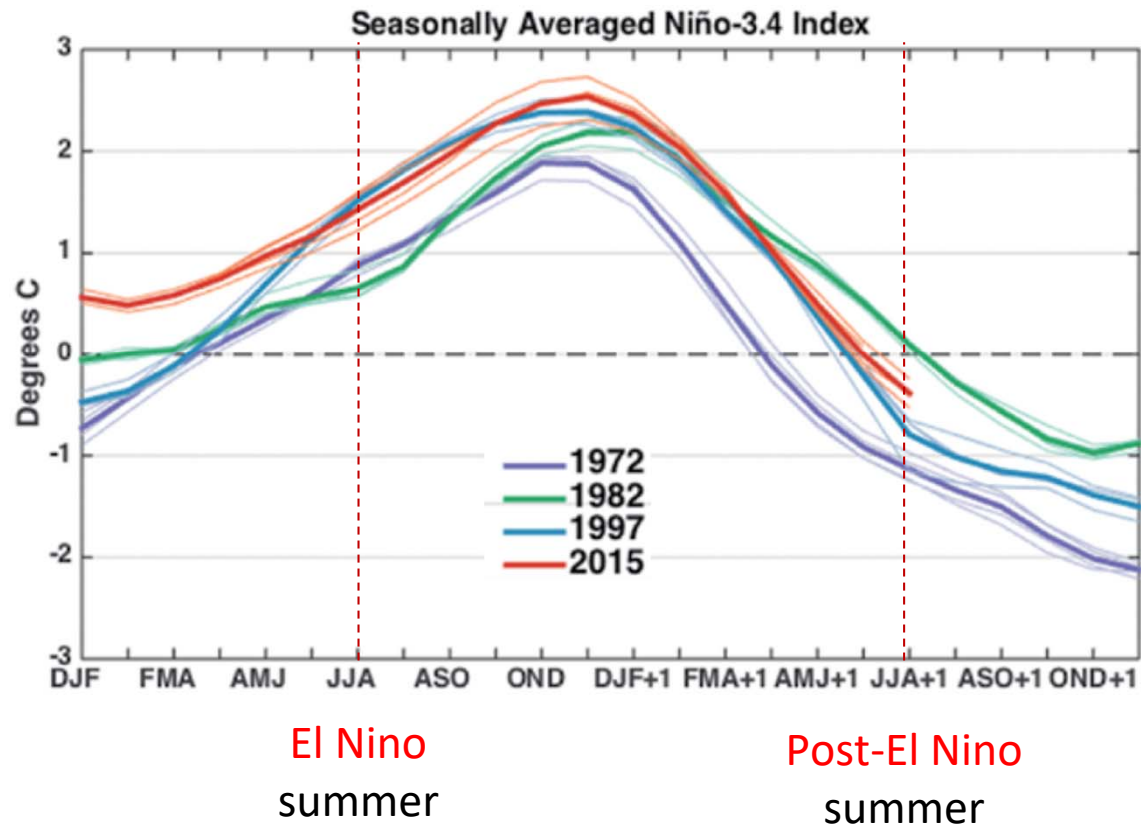


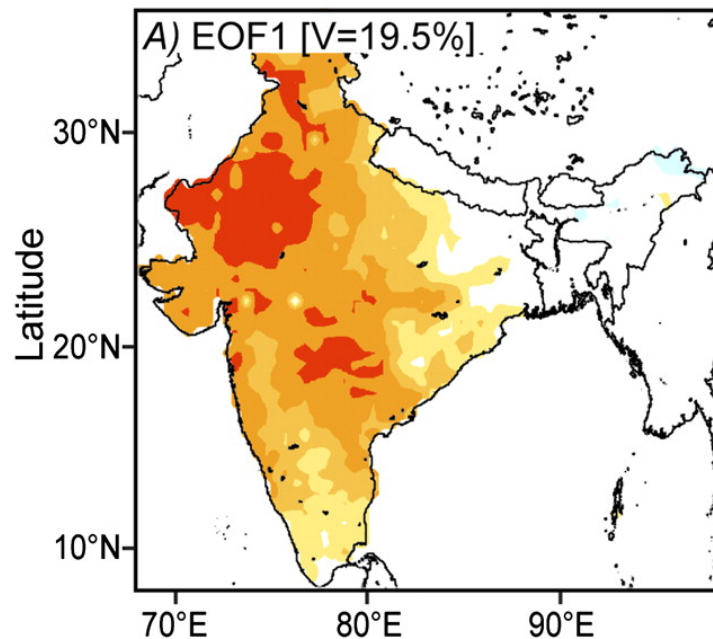
2. Interannual variability of the Asian summer monsoon



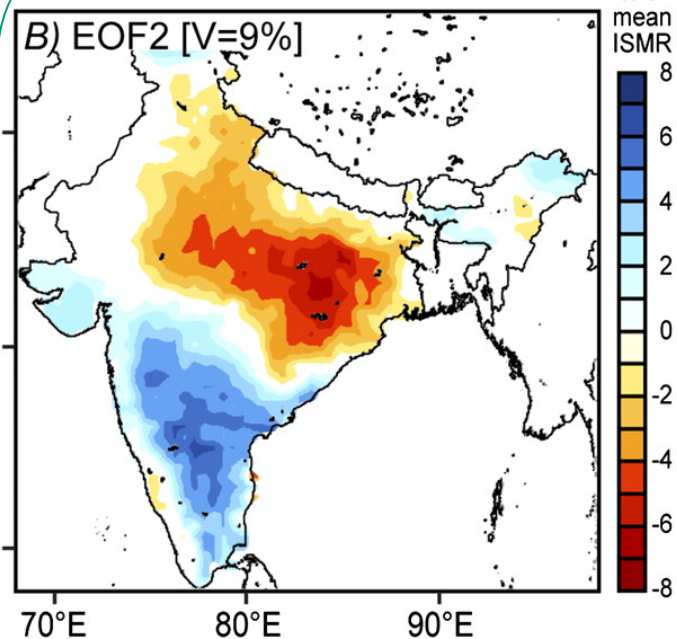
Seasonal phase lock of El Nino



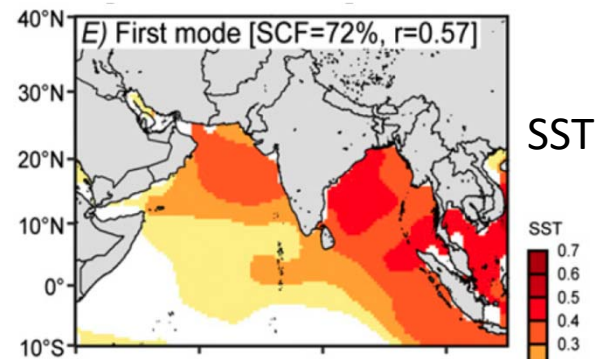
EOFs of JJAS rainfall variability over India for 1900-2008.



El Nino summer
 $r [PC, SOI]=0.52$

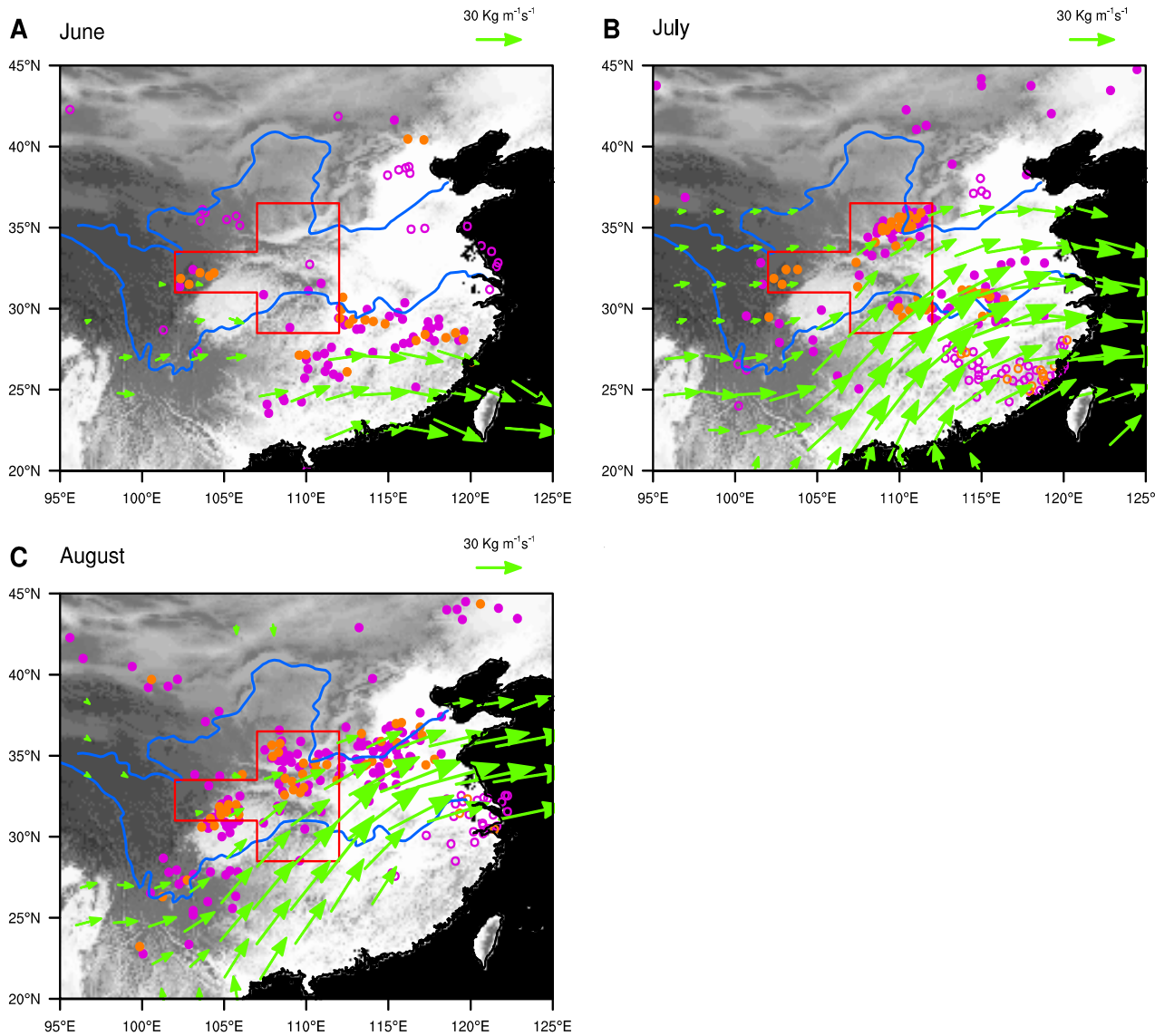


Post-El Nino summer



Mishra et al. (2012, *PNAS*)

Post-El Nino effect (1979-2014)



Corr. w/ antecedent NDJ Nino3.4 SST: gauge rainfall & moisture transport, w/ topography

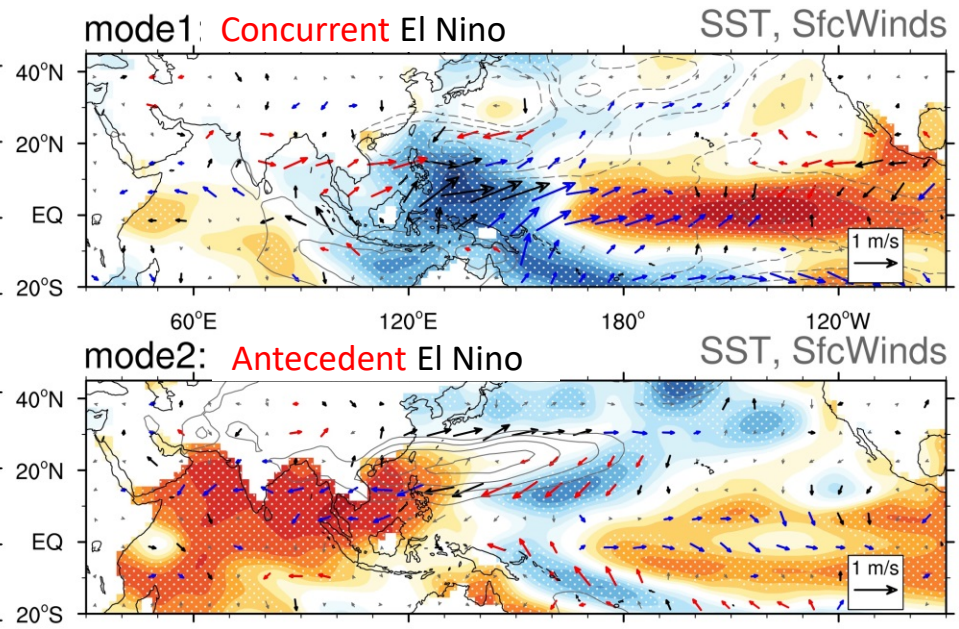
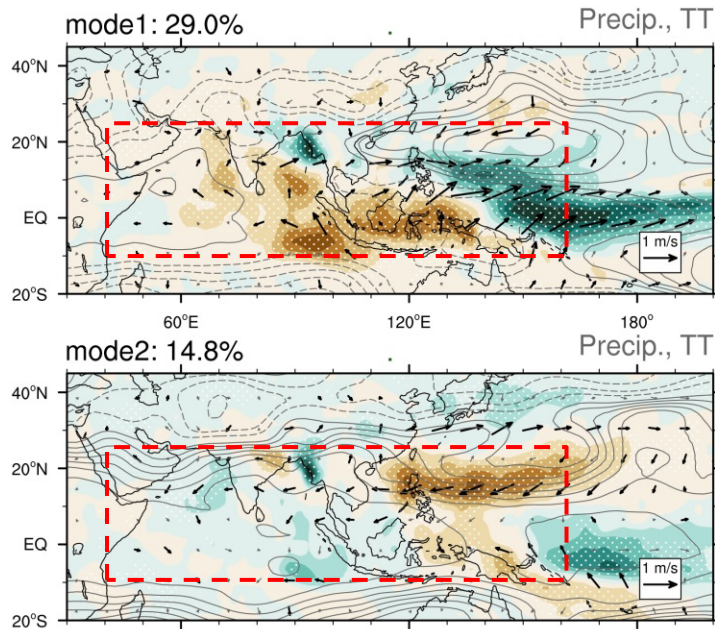
- Strong monthly variations.
- Migrating anomaly bands.
- Orographic effect.

- Positive correlation(95%)
- Negative correlation(95%)
- Positive correlation(99%)
- Negative correlation(99%)

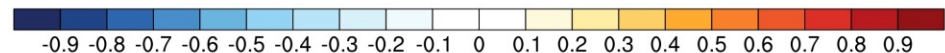
E

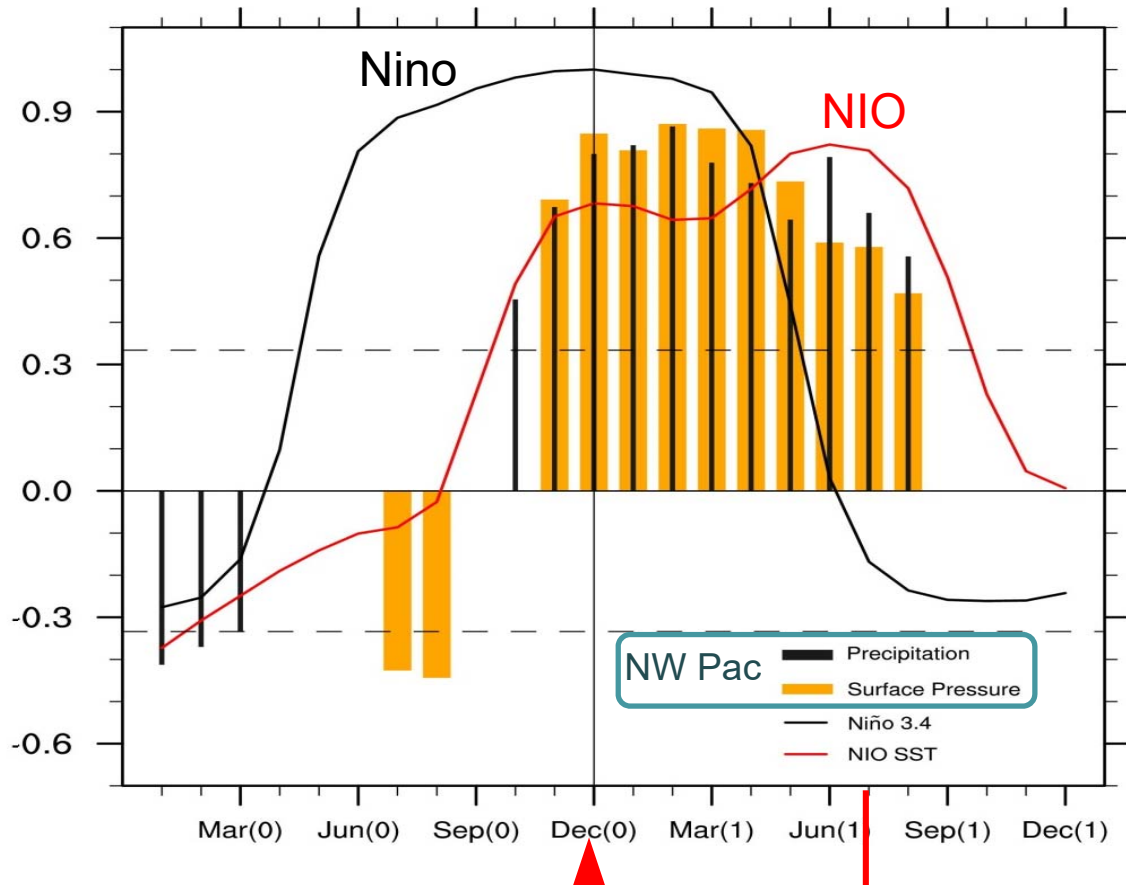
Kaiming Hu et al. (2017, JC)

JJA Precip EOF over Indo-WP



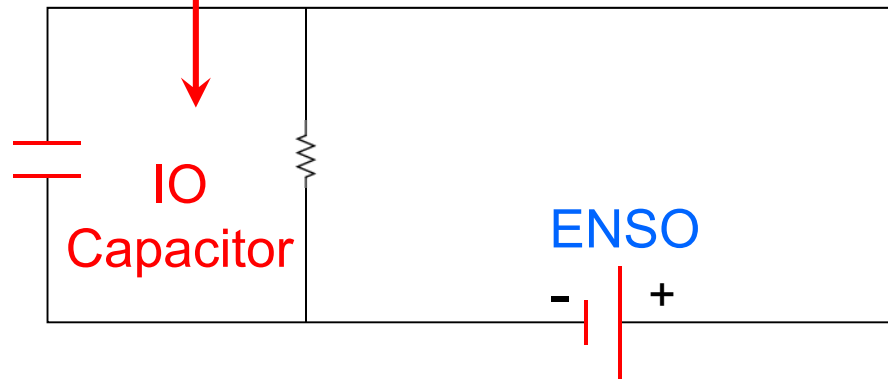
Rainfall EOF	PC1	PC2
JJA Nino 3.4	0.84	
NDJ(-1) Nino 3.4		0.69
JJA NIO		0.84





Indian Ocean warming persists through JJA(1), and could exert climatic influences after El Niño has dissipated.

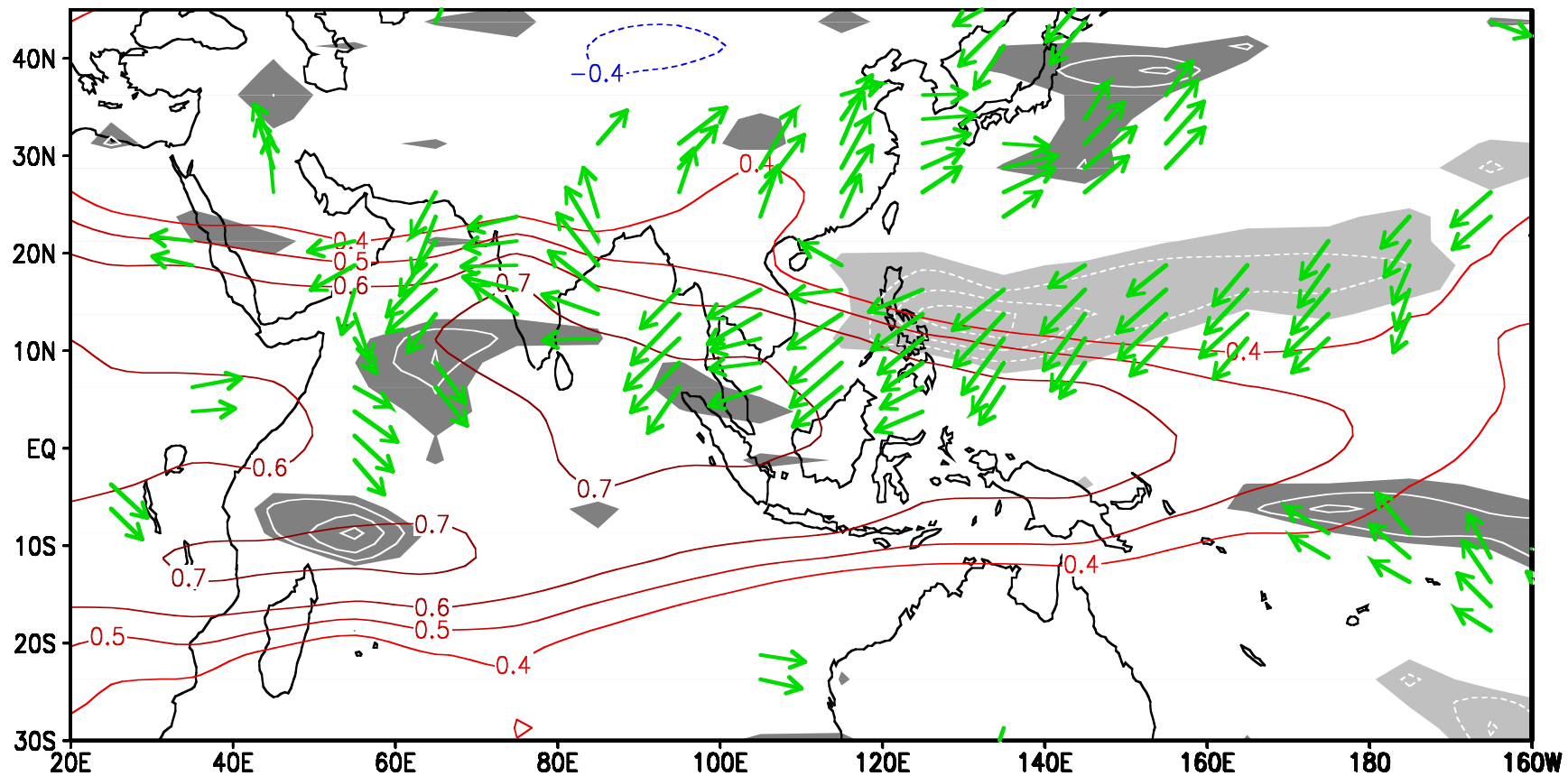
But how?



Post-El Nino summer

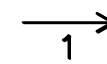
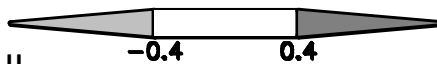
Indian Ocean Capacitor Effect

- IO warming → Warm Kelvin wave into the WP
- Northeasterly winds to the north under friction
- Divergence over NW Pacific ← → Suppressed convection



Correlation with preceding ENSO (NDJ):

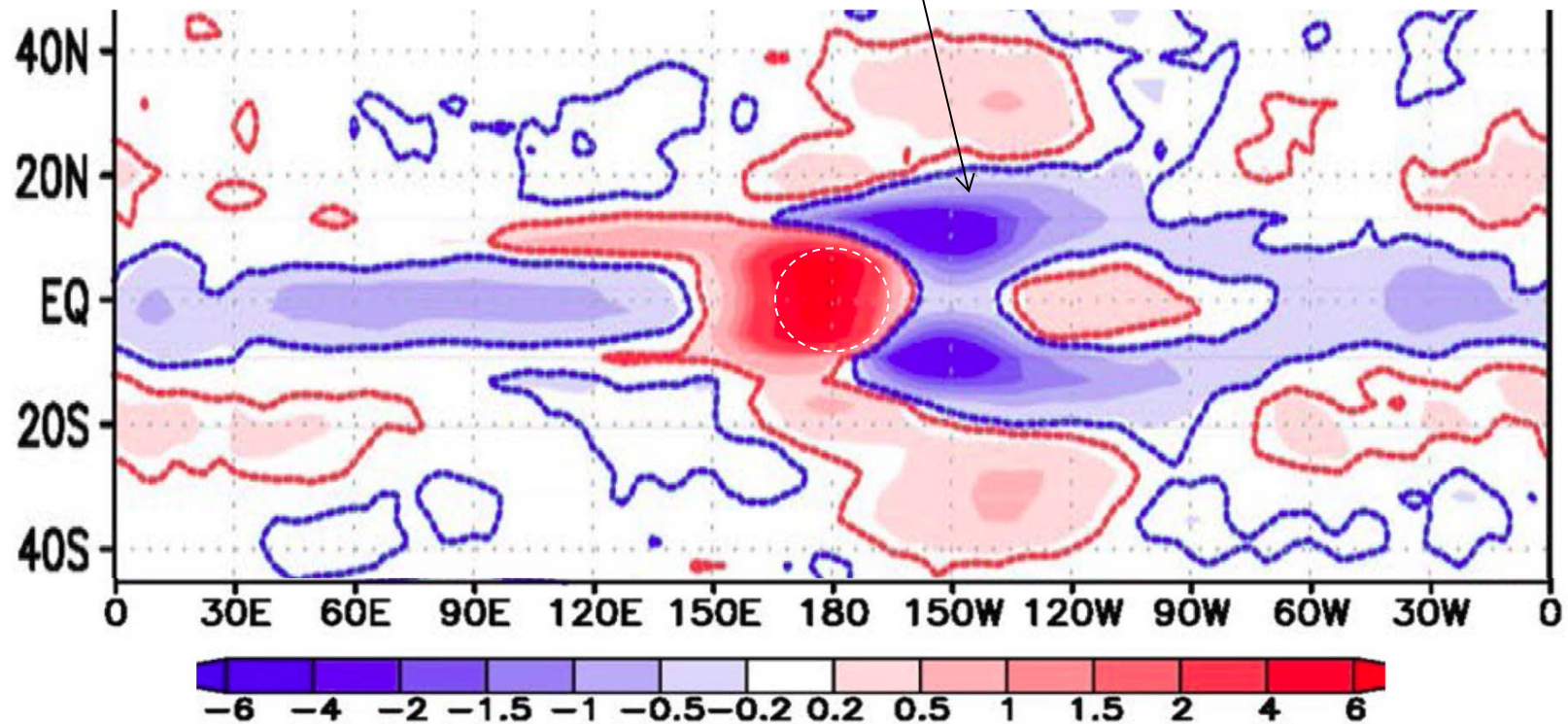
Tropospheric temp, surface wind & rainfall



Xie et al. (2009, JC)

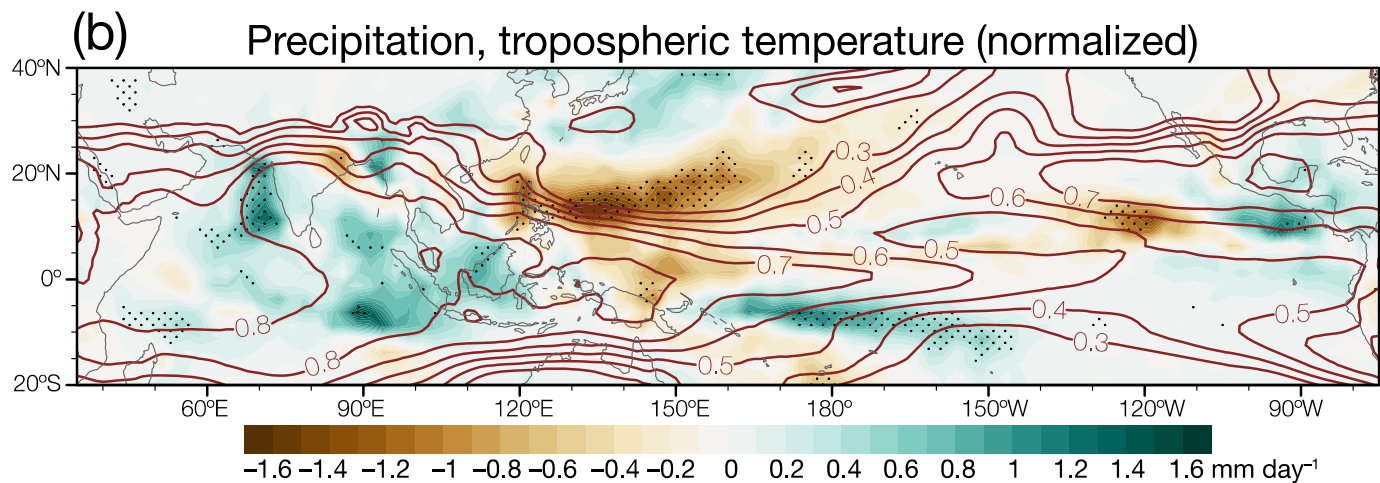
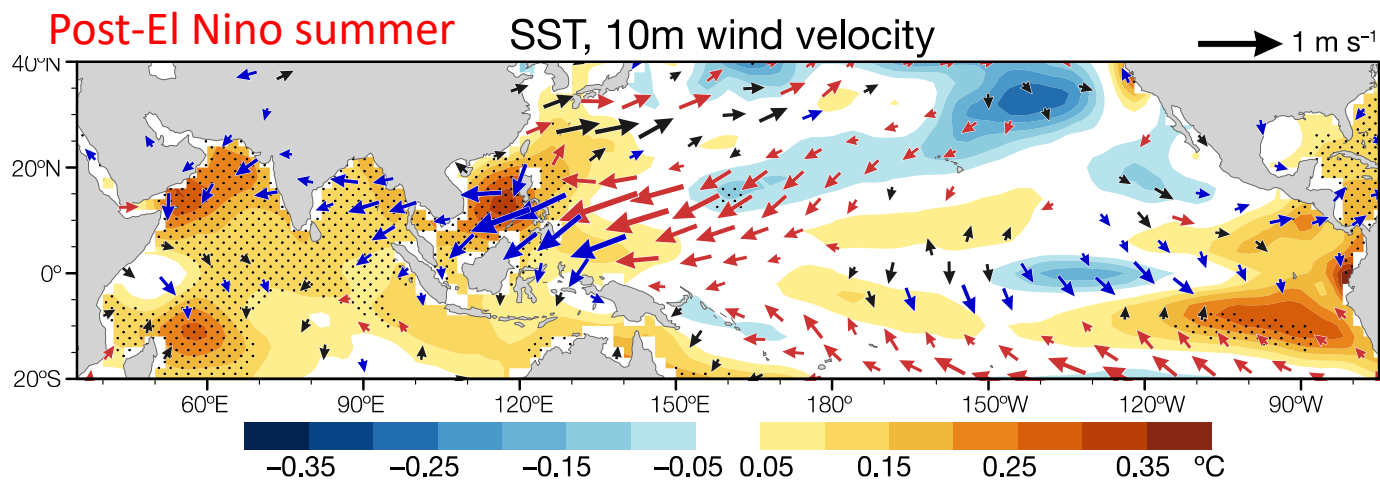
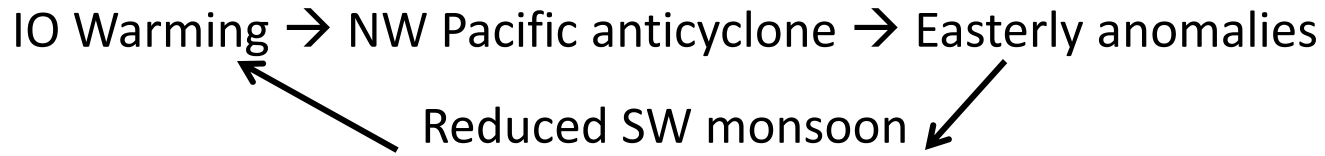
Precip response of moist AGCM to an isolated SST perturbation w/ NS symmetric mean SST

→ Ekman divergence suppresses convection off equator to the east.



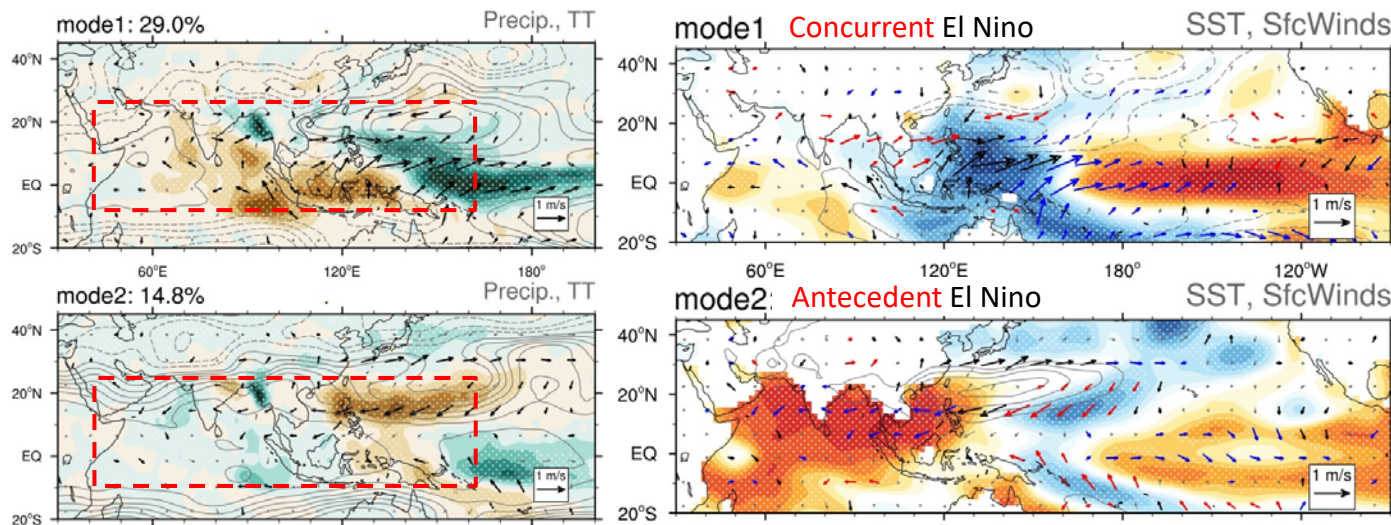
Hamouda & Kucharski (2018, *Clim Dyn*)

Coupled Indo-western Pacific ocean capacitor (IPOC)



Summary

- ENSO affects the Asian summer monsoon in both **concurrent** and **subsequent summers**.
- Indo-western Pacific ocean capacitor (**IPOC**) gives rise to **post-ENSO summer** anomalies.



Xie, S.-P. et al., 2016: Indo-western Pacific ocean capacitor and coherent climate anomalies in post-ENSO summer: A review. *Adv. Atmos. Sci.*, 33, 411-432.