

Role of the SST over the East China Sea in the linkage between East Asian winter and summer monsoon variability.

Yoshiyuki KAJIKAWA¹, Ye -Won SEO², Kyung-Sook YUN²,
Kyung-Ja HA², Richard H. JOHNSON³

¹ *RIKEN Advanced Institute for Computational Science, Kobe, Japan*

² *Global Monsoon Climate Laboratory, Pusan National University, Pusan, Korea*

³ *Department of Atmospheric Science, Colorado State University, Colorado, USA*

The SST and SST gradient over the East China Sea (ECS) and the Northern South China Sea have large interannual variability in boreal winter and spring, especially in March and April. We investigated these SST and SST gradient anomalies and found the important role of these anomalies in the linkage between Asian winter and summer monsoon variability by using observational datasets during 1979-2012. The interannual variability of SST over the ECS in April shows significant warming trend. Of great interest is that the SST anomalies are confined around the ECS and not significantly related to the broad scale Pacific and Indian Ocean SST anomalies. These anomalies appear from boreal winter. The warmer SST anomalies in recent decades are well associated with the weakening of the northeasterly flow along the southern China, East Asian winter monsoon. It reduces the surface wind speed and tends to produce the warmer SST and less SST gradient during boreal winter by decreasing of evaporation and upwelling. These anomalies are maintained and enhanced until the climatological wind direction change in early summer. These warmer SST and less SST gradient anomalies lead to enhanced Meiyu rainfall over the southeastern part of China. This suggests that the increasing rainfall trend over the southern part of China in June indicated by Kajikawa et al (2012) can be explained by the weakening of the East Asian winter monsoon through the SST anomalies over the ECS.

Key words: Monsoon, SST gradient, East China Sea, interannual variability

References:

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