

Name: Xinyao Rong  
rongur@cma.gov.cn  
Chinese Academy of Meteorological Sciences  
46# ZhongGuanCun South Street  
Haidian District, Beijing  
Country: China

Title: Impacts of Atlantic SST anomalies on Indo-East Asian summer monsoon-ENSO relationship

Additional authors: 2. Renhe Zhang, 3. Tim Li

Additional Affiliations: 2. Chinese Academy of Meteorological Sciences Beijing 100086 China, 3. International Pacific Research Center and Department of Meteorology University of Hawaii at Manoa Honolulu HI 96822 USA

Abstract:

In this study, the effect of the tropical North Atlantic (TNA) sea surface temperature (SST) variation in inducing the circulation anomaly in the Indo-East Asian monsoon (IEAM) region is investigated through the observational analysis and numerical modeling.

The observational analysis shows that the TNA summer SST is positively correlated with the preceding winter Niño3 SST

and is simultaneously correlated with the circulation in the IEAM region. The simultaneous circulation pattern resembles that of the ENSO-decaying summer. The positive correlation between the TNA SST and the Niño3 region SST is primarily ascribed to the surface latent heat flux and short wave radiation anomalies induced by the ENSO teleconnection.

Coupled general circulation

model experiments show that, while including the air-sea coupling in the Atlantic, the model can reproduce the main features of

the IEAM circulation, such as an anomalous anticyclone over the western North Pacific (WNP) and southerly anomalies over

southeast China. While the climatological Atlantic SST is prescribed, the circulation over the WNP displays a significantly different

pattern, with an eastward migration of the WNP anticyclone and the associated northerly anomalies over southeast China. It

is argued that anticyclonic shear and Ekman divergence associated with the atmospheric Kelvin wave response to the TNA warm

SSTA forcing is the primary mechanism for the generation of the anomalous anticyclone in WNP. The results presented in this

study provide a teleconnection pattern between TNA and short-term climate variability in IEAM region.  
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