

ENSO Modulation of ISO intensity and Upscale Feedback of ISO on Seasonal Mean SST in the Western North Pacific

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The present study presents evidence for modulation of El Niño-Southern Oscillation (ENSO) on the ISO intensity and feedback of ISO on seasonal mean SST in the tropical western North Pacific region during boreal summer. A pronounced difference is found in the relationship of the tropical western North Pacific 10-20-day and 30-60-day ISO intensity to ENSO. The 10-20-day ISO intensity is enhanced during the El Niño developing summer, whereas the 30-60-day ISO intensity is enhanced during the La Niña decaying summer. The distinct relationship is interpreted based on the different modulation of ENSO on seasonal mean background fields and the different sources and propagation paths of the 10-20-day and 30-60-day ISOs that reach the tropical western North Pacific. An upscale feedback of ISO intensity on local seasonal mean SST change is identified in the tropical western North Pacific, which is more prominent from the 10-20-day than the 30-60-day ISO intensity change. The upscale feedback is due to a net effect of ISOs on surface heat flux anomalies. This is demonstrated by separating latent heat flux anomalies into components on different time scales. The ISO-induced latent heat flux anomalies may accumulate in a season and overcome interannual anomalies due to seasonal mean changes. Thus, the ISO-induced surface heat flux change may play an important role in the seasonal mean SST anomaly in the tropical western North Pacific.

Keywords: ENSO modulation, ISO feedback, Western North Pacific