The lack of westerly wind bursts in 2014 and its relation to background wind states

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The strong El Niño in late 2014 was predicted by many climate scientists based on high warm water volume and successive equatorial westerly wind bursts (WWBs) in early 2014. However, it turned out to be a weak El Niño and developed again in 2015. Several studies have been devoted to elucidate the reasons of the unmatured El Niño in 2014. One of the reasons addressed is the lack of WWBs after boreal spring. In this study, we examine what caused the lack of WWBs in 2014 focusing on background wind states.
The successive WWBs from January to March 2014 excited strong oceanic Kelvin waves, resulting in a large increase in the eastern Pacific sea surface temperature (SST). However, there are no successive WWBs or the Kelvin waves after April, resulting in a decrease in the SST.
Our previous studies have shown that WWBs occur frequently when tropical intraseasonal convection, so-called the Madden-Julian Oscillation (MJO), propagates over the Pacific under the equatorial westerly background states, which contribute to develop eddy disturbances via background zonal wind convergence near the equator. In 2014, there were several MJO events throughout the year. However, few WWBs accompanied the MJO convection.
Focusing on the background states after the WWB occurrences in early 2014, zonal wind convergence was retracted and did not reach the equatorial central Pacific. In boreal summer, climatologically, convectively active and westerly regions shift north of the equator. Because this environmental condition is not favorable for the WWB occurrences, the WWB frequency in boreal summer is statistically low. In 2014, unchanged background states can be a reason for the lack of WWBs even with several MJO events.

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