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Earth System Dynamics
Discussions

Interactive comment on "Contrasting terrestrial carbon cycle responses to the two strongest El Niño events: 1997–98 and 2015–16 El Niños" *by* Jun Wang et al.

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General Comments: The paper dedicated to the different terrestrial carbon cycle responses to the two strongest El Niño events. It is clear that two El Niño events accompany discriminable anomalies in terrestrial carbon flux and it may due to the different spatial pattern in soil wetness and air temperature anomalies.

Wang et al. is well written, the analysis and methodology well described, and the results will no doubt be of interest to the readers of Earth System Dynamics after some additional work.

Specific Comments: 1. Statistical significance In Fig. 3 to 6, the composite results are shown by averaging anomalies for eight El Niño events, except for 1982-83 and 1991-92. However, authors did not show significance levels, so it is hard to say common features in El Niño events. In addition, two extreme cases have the larger anomalies than composite results, but it is needed that how significant between extreme cases and composite results as normal cases. By using bootstrap estimation, it can be possible to address P-value and significant levels.

Then, it would be more clear that how anomalies in soil wetness and air temperature act regional terrestrial carbon flux, especially for two extreme El Niño events.

2. Seasonal evolution Recently, Kim et al. (2016) argued that carbon flux in South Asia lead to the delayed peak in the ENSO-related carbon cycle. Authors already analysed regionally, but more detail analysis, as like Kim et al. (2016), is needed in order to understand different features in the delayed peak for two extreme El Niño events.

Technical Corrections: 1. Line 24 and 373: El Nino -> El Niño

Reference Kim, J.-S., Kug, J.-S., Yoon, J.-H. & Jeong, S.-J. Increased atmospheric CO2 growth rate during EI Niño driven by reduced terrestrial productivity in the CMIP5 ESMs. J. Clim. 29, 8783-8805 (2016).

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