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Interactive comment on "Evaluation of the eastern equatorial Pacific SST seasonal cycle in CMIP5 models" *by* Z. Song et al.

Anonymous Referee #1

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Review of os-2014-13: Evaluation of the eastern equatorial Pacific SST seasonal cycle in the CMIP5 models

General comments:

This manuscript reported an improvement for simulating the SST annual cycle in the eastern equatorial Pacific in CMIP5 CGCMs, while some CMIP3 CGCMs have a semi-annual cycle rather than an annual cycle, as observed. The finding is useful and important for the climate research and modeling communities, although the present analysis/conclusions might be only fair. I would suggest the following revisions.

Specific comments:

1) When I carefully checked Fig. 3 of de Szoeke and Xie (2008), it seems that many

CMIP3 CGCMs can also simulate the annual cycle in the EEP SST, although weaker in magnitude due to a boreal spring cold tongue bias. The authors may need to quantitatively show the "improvement" for simulating the EEP SST annual cycle in the CMIP5 CGCMs (relative to CMIP3), such as by adding a direct comparison among the observations, CMIP3 and CMIP5 CGCMs in Figs. 3a and 3b of the manuscript.

2) The manuscript reported a warm bias of EP1 in boreal summer, leading to a reduction in the amplitude of EP1 SST annual cycle. This is a useful finding. However, I think that the contribution from the cool bias in boreal spring is equally important in Fig. 3, and cannot thus be ignored. Li and Xie (2012) have regarded the cool bias as an ocean origin. The authors may need to add some discussion about the effect of the cool bias.

Technical corrections:

1) In Line 18 of P. 1131, de Szoeke et al. (2008) ——de Szoeke and Xie (2008)

2) In Line 8 of P. 1134, MME: multi-model ensemble mean

References:

de Szoeke, S. P., and S.-P. Xie, 2008: The tropical eastern Pacific seasonal cycle: Assessment of errors and mechanisms in IPCC AR4 coupled ocean–atmosphere general circulation models. J. Climate,21, 2573–2590.

Li, G., and S.-P. Xie, 2012: Origins of tropical-wide SST biases in CMIP multi-modelensembles. Geophys. Res. Lett.,39, L22703, doi:10.1029/2012GL053777.

Interactive comment on Ocean Sci. Discuss., 11, 1129, 2014.