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Climate of the Past Discussions

Interactive comment on "Do periodic consolidations of Pacific countercurrents trigger global cooling by equatorially symmetric La Niña?" *by* J. H. Duke

Anonymous Referee #2

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This paper deals with a very interesting and important phenomenon in climate, discussing what is happening in the Pacific equatorial ocean (ENSO et al.). The analysis is based on a very detailed and accurate set of data.

However, the description given by the author concerns local information(in time and space)and I do not see how the conclusions can be directly generalised for the whole climate system and even less for the longer time scales (section 8).

I would suggest that the author concentrates first on the explanation of the present-day data trying to come with a clear set of successive processes explaining finally the observations. The large number of references to strengthen the author's affirmations is

welcome but makes the whole paper very difficult to read and in some way confuse. Sections 3, 4 and 5 are a good attempt to give such explanation but with no real personal demonstration, the author always referring to different papers to go a step further in a rather qualitative and speculative way.

I would certainly welcome a deeply revised manuscript because the subject is important and there are a substantial number of good references given by the author that might potentially lead to rationale and clear conclusions.

I would leave the application of these conclusions to the longer time scales for another paper. Section 6 starts to refer to the long time scale and also to CO2 cycle. Many of the suggested processes are speculative and I will keep only what is related to present-day climate in the revised manuscript.

For example p. 923

"/This is what is observed in July 1998 (www.esrl.noaa.gov), so southward ITCZ migrations associated with ESLN (either precessional or imposed by ITR) could have the same result. Additionally, if // //glacial ESLN were persistent, westward SEC surface transport from the ESLN cold eye would reflect increased upwelling of saline thermocline water and increased evaporation under ESLN subsidence/."

As the tense "could" and "would" let assume this remains totally speculative up to the demonstration that the relationship is robust.

As indicated by its title, section 7 would belong to the revised paper, but section 8 is definitely dealing with what might appears in another paper about the impacts of IRT, PCC, ESLN on the long time scale climatic variations. Here again, the paper must be re-written in a much more logical way describing clearly the set of events linking the forcing to the response of the climate system. This is going well over a list of citations and subjective conclusions.

In its present form, I therefore recommend to do not accept the paper for publication,

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but suggest that the author revises deeply his manuscript. The present-day part of the paper must be made more logical and possibly more easily understandable by the general readers of Climate of the Past, rather than by scientists specialized in the ENSO phenomena as the technical terms, the processes involved, the references and the abbreviations let assume.

Interactive comment on Clim. Past Discuss., 6, 905, 2010.