

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

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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 appear 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.

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