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Analysis of El Niño events from the Atlantic remote influence

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Recent studies have found an enhancement of the correlation scores between the Atlantic and Pacific Niños since late 60's, and also how the summer Atlantic Niño is able to alter the dynamics of the central and eastern Pacific windstress via anomalous Walker circulation, triggering processes which are able to develop a Pacific La Niña during the next winter (Rodríguez-Fonseca et al., 2009).

In a former work, the analysis of the partially coupled simulations used in Rodríguez-Fonseca et al. (2009) showed a significant change in the winter windstress and thermocline depth over the equatorial Pacific after the 70's during the summer Atlantic Niño years , a change which was not present in the previous decades (Martin-Rey et al., 2010). In that work, the net heat fluxes and the horizontal advection terms of the heat budget were not able to explain the winter changes in SSTs, pointing to the possible contribution of the vertical mixing. Also, a change in the characteristic dynamical parameters calculated by the model for ENSO events (thermocline depth, SST and zonal wind) was present when comparing the decades before and after the 70's.

As a continuation of that work, the present study analyses the other oceanic processes involved in the heat budget (vertical mixing and diffusion) of the Equatorial Pacific during the Atlantic Niño events, in order to close the balance in winter. The analysis is done for both, model and observations.
Also, an statistical analysis of the ENSO events is done in order to know the possible changes in type and intensity of these phenomena after the 70's, due to Atlantic remote influence, considering not only the interannual processes but also the change in the Pacific basic state.