frequency correction allows us to have a systematic ocean-atmosphere interaction at time scales shorter than Equatorial inertial period (~1.5days) at this assymptotic limit the coupling by Heat Flux balance is consistent. Experiments are conducted with the coupled/non-coupled model integrated for a period that runs from January 1990 to December 1999, so the El Niño 1997-98 was included in the simulations. Several Convectively Coupled Equatorial Waves were isolated with the use of the space-time spectral analysis. A common metric between model results and observations is ensured by using the same spectral regions, equivalent depths and noise/signal separation used in previous observational studies. The general results showed that the coupling here used is a modulating factor acting mainly over intraseasonal scales without altering so much the mean. The coupling acted preferentially in the representation of the intraseasonal modes with eastward propagation, increasing its variability and its propagation mainly over the Maritime Continent. It is suggested that the very efficient way of the QTCM to project vertically atmospheric boundary layer perturbations was the responsible of the effect of the coupling on intraseasonal time scales.

HCS138 - Intraseasonal to annual propagating variability in a medium-resolution regional model simulation of the South Eastern Pacific

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The oceanic variability of the South-Eastern Pacific is peculiar in that the coastal variability off Peru and Chile connects the equatorial Kelvin waves to the extra-tropical Rossby waves at a variety of timescales, from intraseasonal to interannual. The off-shore propagating variability may participate to the extension of the Oxygene Minimum Zone (OMZ) in this region know to be the most productive of the world. Here, we present the results of a medium resolution, eddy permitting regional model simulation for the eastern south Pacific. The model is forced with observed climatological fluxes during 5 years. Our objective is to investigate the intraseasonal to annual propagating signal in the model and understand how the energy is transmitted both from the open boundaries along the coast and to the inner basin and from the coastal zone to the off-shore ocean. Assuming O_2 concentration as a passive tracer, we also wish to estimate to which extend the OMZ variability can be related to the zonal advection of O_2 concentration by the extra-tropical Rossby wave.
Comparison with available observations indicates that the model mean state is realistic enough to further investigate the characteristics of the propagating variability along the coast and off-shore. The simulated sea level anomalies are first compared to the TOPEX/POSEIDON satellite derived data. Despite mesoscale features are not well resolved by the model, the simulated variability has a pattern in rather good agreement with the observations with a comparable decrease of the variability from the coast to the open ocean and southward. A vertical mode decomposition of the simulated pressure field is then carried out. Results indicate that the sea level variability projects to a large extend on the first three baroclinic modes, with an eastern extension of the variability from the coast for the gravest mode of the seasonal cycle (figure). The semi-annual cycle associated variability is more concentrated near the coast and exhibits less consistent off-shore propagating characteristics than the annual cycle. The intraseasonal variability display peaks in the inner basin between 33°S and 15°S and a minimum in a 'shadow zone' just off-shore, between 27°S and 17°S. The higher the mode order, the more to the North the location of maximum variability consistently with the triggering of extra-tropical Rossby waves equatorward of the critical latitudes. Analyses of the seasonal propagating variability indicates that it is forced both locally by the annual cycle and remotely at semi-annual timescales by the equatorial variability. On the other hand, westward propagating characteristics of the intraseasonal variability results to a large extent from wave interactions processes and modal dispersion. Results of sensitivity experiment to the wind stress and boundary forcings indicate that a large part of the off-shore intraseasonal current variability off central Chile is associated to the equatorial forcing. It is suggested that the seasonal westward expansion of the OMZ in that region is associated to the advection of low O_2 concentration by the extra-tropical Rossby waves.

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