

Modification of ENSO properties in climate change conditions simulated with coupled models.

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El Niño-Southern Oscillation (ENSO) being one of the most important interannual signals in the climate system and a primary source for seasonal forecasting around the globe, its sensitivity to increased greenhouse forcing has gathered the interest of climate researchers in the recent years. Our work adds to their efforts and attempts to identify changes in ENSO associated with the greenhouse warming, as well as their possible physical causes. We analyze data from control and scenario simulations performed with two different coupled models, the UKMO and the GFDL models. Using a clustering technique, we find ENSO episodes in the models can be classified into two large classes: one shows westward propagating equatorial SST anomalies, while the other is distinguished by eastward propagating anomalies. The behaviour of the rest of relevant variables in the tropical Pacific atmosphere-ocean system offers a complete view of the characteristics of each class that is consistent with our current knowledge of ENSO physics and its variety. The comparison of the results in control and scenario runs reveals an asymmetric response of each of the classes to the increased greenhouse forcing. We discuss the physical reasons for this asymmetry and also look for connections with ENSO changes observed in nature during the last century.