



El Niño and La Niña amplitude asymmetry caused by atmospheric feedbacks

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Interannual variability of eastern tropical Pacific sea surface temperatures (SST) has an asymmetry with stronger positive events, El Niño, and weaker negative events, La Niña, which is generally attributed to processes in the ocean. Here we present evidence from a hybrid coupled model that the El Niño-La Niña asymmetry is caused by nonlinear atmospheric feedbacks. The model consists of the ECHAM5 global atmospheric general circulation model coupled to the 2-dimensional El Niño linear recharge oscillator ocean model in the tropical Pacific. Despite the models simplistic and linear representation of the ocean dynamics, it is able to simulate the main statistical features of El Niño including spectral variance, seasonality, skewness, and kurtosis. Analyses of the model show that a nonlinear relationship between the zonal wind stress and SST is causing the El Niño-La Niña asymmetry.