## ABSTRACT

# EL NIÑO AND THE SOUTHERN OSCILLATION IN PARAMETERIZED AND SUPER-PARAMETERIZED COUPLED GENERAL CIRCULATION MODELS

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The explicit treatment of cloud-scale processes in a super-parameterized (SP) coupled general circulation model (CGCM), the NCAR SP Community Climate System Model (SP-CCSM), is seen to produce improved low-level wind variability on interannual (IA) time scales relative to the model (CCSM, version 3) with more conventional parameterization of convection from which it has been derived. In this study, a statistical method is used to introduce an adjustment to the surface wind that represents the dominant modes of variability in response to the total diabatic heating resulting from the explicit treatment of clouds in the host model simulation. The purpose is to (i) understand the different ENSO behavior in the two CGCMs and (ii) isolate and quantify the impact of the horizontal gradients and time evolution of the surface stress forcing of the ocean due to the IA surface stress variability. The usefulness of this approach in isolating the effects of equatorial and off-equatorial oceanic wave response to the IA surface stress forcing is demonstrated.

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