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The Slab Ocean El Nino

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In a series of Atmospheric model simulations coupled to a simple slab ocean model it is illustrated that El Niño type of SST variability can exist in the absence of any ocean dynamics. Atmospheric feedbacks in cloud cover and changes in the wind field can produce positive and delayed negative feedbacks, that together with the heat capacity of the upper ocean can produce a damped interannual oscillation in the equatorial Pacific, that is comparable in strength and has characteristics to the observed phenomenon. The evolution of the SST pattern is similar to the SST-mode of El Niño, but is entirely controlled by atmospheric feedbacks. The predictability is beyond that of the red noise hypothesis assumed for slab ocean models. The results challenge and extend our current understanding of the feedback mechanisms of El Niño in climate models and may also highlight possible atmospheric mechanisms that could partly control some observed ENSO events.