



Decadal variations in the ENSO/East Asian Summer Monsoon relationship

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A partially coupled climate model (PCM) is used to investigate the relationship between the East Asian Summer Monsoon and ENSO. In the PCM, the wind stress seen by the ocean component of a fully-coupled atmosphere/ocean model is replaced by the time series of observed wind stress, while the thermodynamic interaction between the ocean/atmosphere models is unconstrained and computed using the fully-coupled ocean/atmosphere model dynamics. An ensemble of such experiments is carried out using different initial conditions for each ensemble member. The PCM exhibits considerable skill at reproducing the observed ENSO cycle, even in individual ensemble members, and also shows skill at reproducing the observed time series of the Pacific-Japan (P-J) pattern which, in turn, strongly influences the East Asian Summer Monsoon. It is found that in the ensemble mean, the relationship between the P-J pattern and ENSO is stable in different overlapping 21 year time periods, whereas the relationship in the individual ensemble members shows considerable variability, in some 21 year time periods showing a strong link while in other 21 year time periods showing no significant link, similar to what is seen in the observations. Nevertheless, after the 1976/77 climate shift in the Pacific, the P-J/ENSO link is stronger amongst the ensemble members than before, indicating a stronger signal to noise ratio following the climate shift, again consistent with observations.