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Is Asian monsoon precipitation overly sensitive to SST anomalies in coupled models?

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Many modeling studies demonstrate improved Asian monsoon simulations when an atmospheric model is either coupled to an interactive ocean or driven with high-frequency specified SSTs . However, using monthly mean data from five CMIP3-participating models, Bollasina and Nigam (2009) conclude that "coupled models tend to emphasize local forcing in the Indian Ocean as reflected by their large precipitation-SST correlations, at odds with the weak links in observations..." A similar conclusion was reached by Wu et al. (2008) for the Climate Forecast System (CFS) model when they compared 3-day mean model data to 3-day mean precipitation and SST observations from the TRMM Microwave Imager. In this study, we develop a method to estimate daily SST anomalies in CMIP3 models using monthly mean SST and daily mean surface upwelling longwave radiation. Lagged-correlations between daily precipitation and estimated daily SST are computed for several CMIP3 models using the approach of Wu et al. (2008) and compared to TMI SST and precipitation estimates in order to assess model SST-rainfall sensitivity. At intraseasonal timescales, most CMIP3 models produce larger SST-rainfall correlations over the Indian and West Pacific Oceans than seen in the TMI data. We apply the MJO CLIVAR diagnostics to obtain a simple index of the northward-propagating component of the Asian monsoon (NP). Scatter plots of the NP index versus SST-rainfall correlation reveal that models with a higher SST-rainfall correlation also have a larger NP index. Models with SST-rainfall correlations closest to the TMI relation tend to have the lowest NP index, at odds with the high NP index seen in observations. Finally, preliminary results suggest that the SST-rainfall relationship is not constant with time, but may vary on interannual timescales.