

A recipe for ENSO-monsoon diagnostics in CMIP5 models

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Of all the boundary forcings, the sea surface temperature (SST) anomalies associated with ENSO are found to be the single dominant forcing element of the monsoon interannual variability. To capture the ENSO-monsoon association realistically in coupled general circulation model simulations, we propose a set of diagnostics based on dynamical and physical arguments. Of them, realistic simulation of the location, timing and intensity of ENSO-related SST and diabatic heating anomalies along the equatorial Pacific and spatial distribution of regional mean monsoon precipitation zones over the Asian summer monsoon domain are the primary elements. Then, the models need to capture the asymmetry in the ENSO-monsoon relationship (El Niño vs La Nina). Third, the models need to capture correctly ENSO's impact on south Asian versus tropical west Pacific monsoon subsystems.