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Title:	How reliable are Coupled Model Intercomparison Project Phase 6 models in representing the Asian summer monsoon anticyclone?
Authors:	Attada, Raju (/jspui/browse?type=author&value=Attada%2C+Raju)
Keywords:	Coupled Model SST correlations
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Abstract:	We assess the Asian summer monsoon anticyclone (ASMA) in Coupled Model Intercomparison Project Phase 6 (CMIP6) models for the historical period (1850–2014). The ASMA is a quasi-stationary warm anticyclone during the boreal summer monsoon season, centred around Tibet. It is a prominent circulation feature that affects trace species transport, stratosphere–troposphere exchange, along with strong feedbacks to weather and climate. The study is a novel attempt to quantify the performance of models participating in the CMIP6 consortium and understand long-term variability and teleconnections of the ASMA. We note that CMIP6 models capture the mean ASMA features reasonably well, albeit with some differences around the edges. For most of the models, interannual variations are not in phase with the reanalysis and show sharper increasing trend in the ASMA strength. There is about a twofold increase in the trends during the recent period (1980–2014) as compared to the 1950–2014 period. A multimodel mean (MME) chosen based upon the statistical metrics (mean, standard deviation, mean absolute error and root-mean-square error), target diagram, and density distributions is further used to examine the prominent modes of variability. Our results suggest that the signals of significant periodicity, particularly the 2–4 years signal, and the SST correlations in MME are inconsistent with observations. In CMIP6 models, we note stronger upper level divergence over the western and eastern Pacific but convergence over the Indian ocean, South Asia and the central Pacific. The streamfunction and rotational winds also show strong highs north of 20°N. Overall, it is seen that basic features such as spatial extent and evolution of ASMA are reasonably captured, but the strength and interannual variations are dissonant across the CMIP6 models. These findings are useful for studies focusing on regional meteorology, transportation of atmospheric tracers and climate change projections over the region involving the ASMA.
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