



ENSO teleconnections to the Indian summer monsoon in observations and models

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The teleconnections of different types of El Niño Southern Oscillation (ENSO) to the Indian Summer Monsoon are investigated in observations and models. We find that, not all regions in India are strongly affected by ENSO, so we focus on two regional teleconnections i) a negative rainfall signal around Central North East (CNE) India and 'Hilly' region during El Niño (and vice versa for La Niña) and, ii) similar signal for parts of Southern Peninsular region. Using correlations, it is found that more than 50% of the CMIP5 models capture these two regional teleconnections, with first captured by more than 80% of models. Furthermore, using a compositing technique that may better capture asymmetries in the response to warm and cold events, we find that most models again agree on the sign of regional teleconnection around the CNE and Hilly region, suggesting the robustness of ENSO signal in that region. The Peninsular teleconnection is less well simulated in models. We find a clear connection between the Walker Circulation and Indian Summer Monsoon rainfall around central India in models.