

EGU21-10315

<https://doi.org/10.5194/egusphere-egu21-10315>

EGU General Assembly 2021

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Indian Ocean mediates the ENSO teleconnections to the Central Southwest Asia during the wet season

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Central Southwest Asia (CSWA) is a region with the largest number of glaciers, outside the polar regions in its northeast and the Arabian desert to its southwest. The region receives precipitation from November to April period also known as the wet season, which contributes to the regional freshwater resources. Mainly, El Niño–Southern Oscillation (ENSO) modulates the wet season precipitation over CSWA, with a positive relationship. However, the intraseasonal characteristics of ENSO influence are largely unknown, which may be important to understand the regional sub-seasonal to seasonal hydroclimate variability. We noted that the ENSO–CSWA teleconnection varies intraseasonally and is a combination of direct and indirect positive influences. The ENSO direct influence is through a Rossby wave–like pattern in the tail months of the wet season, while the indirect influence is noted through an ENSO–forced atmospheric dipole of diabatic heating anomalies in the tropical Indian Ocean (TIO), which also generates a Rossby wave–like forcing and persists throughout the wet season. The stronger ENSO influence is found when both direct and indirect modes are in phase, while the relationship breaks down when the two modes are out of phase. Moreover, the idealized numerical simulations confirm and reproduce the observed circulation patterns. This suggests that improvements in sub-seasonal to seasonal scale predictability requires the better representation of intraseasonal variability of ENSO teleconnection, as well as the role of interbasin interactions in its propagation.