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Decadal interactions between the western tropical Pacific and the North Atlantic Oscillation.

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The relationship between interdecadal variation of tropical sea-surface temperature (SST) in the last 120 years and circulation anomalies related to the North Atlantic Oscillation (NAO) is investigated in this study.

Using an atmospheric general circulation model (AGCM), we confirm observational evidence that variations in the SST gradient in the western tropical Pacific are consistent with the NAO anomalies on decadal time-scale, and may account for the shift towards the positive NAO phase observed in the late 20th century. The role played by the Indian Ocean-NAO teleconnection, advocated in recent studies focused on the last 50 years, is also assessed in the context of the 120-year long record. It is suggested that a positive feedback between Pacific SST and the hemispheric circulation pattern embedding the decadal NAO signal may act to enhance the internal variability of the coupled ocean-atmosphere system, and justify the stronger teleconnection found in observational data than in SST-forced AGCM experiments.