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Tropical Pacific response to 20th century Atlantic warming

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The analysis of a series of regionally coupled ocean - atmospheric simulations suggests that the Atlantic warming that has occurred in the 20th century may have reduced the concomitant warming in the eastern tropical Pacific. The Pacific response to the Atlantic warming shows La Nina like features even in the presence of greenhouse gas (GHG) forcing. The physical mechanism for the Atlantic warming influence on the tropical Pacific is a change in the Walker circulation that results in easterly surface wind anomalies in the central-west Pacific. Coupled ocean-atmosphere processes then amplify the signal. The possibility of an Atlantic Ocean induced cooling of the eastern tropical Pacific is complementary to the hypothesis that the GHG forcing itself may have caused the observed relative eastern Pacific cooling. It is argued that the uncertainties in the projected future mean state in the Pacific may be partly due to the competition of the GHG induced warming and the Atlantic induced cooling.