Tropical Atlantic warming impacts on subdecadal variability in the Pacific

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We demonstrate the significant impact of the tropical Atlantic Ocean on the Pacific climate on subdecadal timescales, by the so-called pacemaker experiments (partial data assimilation experiments). In mid-2000s when the positive peak of the Atlantic Multidecadal Oscillation was observed, the high sea surface temperature over the tropical Atlantic Ocean strengthened the equatorial Pacific trade wind and worked to keep warm and cold tendencies in the western and eastern Pacific Oceans, respectively. In addition, an anti-cyclonic surface wind anomaly formed in the off-equatorial area of the North Pacific works to raise the upper ocean heat content below and contributes to the subsequent warming in the western Pacific Ocean. These changes of the off-equatorial surface winds are similar to common responses to seasonal warming of the tropical Atlantic Ocean, while the deepening of the ocean thermocline is also simulated as dynamical ocean response on subdecadal timescales.

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