Geophysical Research Abstracts
Vol. 20, EGU2018-19202, 2018
EGU General Assembly 2018

Global-warming hiatus triggered the inactive Indian Ocean Dipole

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The Indian Ocean dipole (IOD) is a dominant climate mode in the Indian Ocean. IOD reconstruction based on coral records suggested the IOD had intensified, as the global temperature increasing in the last century. Recent air-temperature observations revealed the global-warming was slowdown since the late-1990s. Here, we demonstrate influence of the global-warming hiatus to the IOD using 26-year anomalies of sea surface temperature (SSTanom) and oxygen isotope in seawater (δ18Osw-anom) from the Porites coral in the Gulf of Oman.
δ18Osw-anom presented the regime shift toward -0.33‰ lower after 1999. We compared seasonal mean cycles of coral records between the neutral and the positive-IOD year before and after the regime shift. SSTanom and δ18Osw-anom in summer of the positive-IOD year was higher than those of the neutral year before the regime shift. However, SSTanom and δ18Osw-anom in summer of the positive-IOD year were close to those in the neutral year after the regime shift.
The regime shift of SSTanom and δ18Osw-anom would be caused by the strong upwelling in the western Indian Ocean which was generated by the intensified Walker circulation, related to the global-warming hiatus. The intensified upwelling would decrease IOD fluctuation in the western Indian Ocean after the regime shift. These results suggested IOD would become inactive under the global-warming hiatus.