

Revisiting the ENSO impact on the Indian Ocean SST based on the combined linear regression

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El Niño-Southern Oscillation (ENSO) has great impacts on the Indian Ocean (IO) sea surface temperature (SST). In fact, two major climate modes of the IO that exert strong influences to the IO rim countries, namely the Indian Ocean Basin (IOB) and Indian Ocean Dipole (IOD) modes, are influenced by the ENSO. Based on the combined linear regression, this study quantifies ENSO impacts on these two modes in ENSO concurrent, developing and decaying phases. It is shown that the number of IOB and IOD events decreases by 83% and 25% after adequately removing ENSO influences, respectively. In terms of seasonal march, without ENSO signature, the spring peak of IOB disappears, while the autumn peak of IOD still exists with smaller amplitude. Also, the developing (decaying) phase of ENSO is more influential to the IOD (IOB) development. This implies that merely removing the concurrent ENSO impacts is not sufficient to study the intrinsic SST variability of the IO, and the present method may be useful to study the IO internal variability independent of ENSO.

Keywords: Indian Ocean, Sea Surface Temperature (SST), El Nino-Southern Oscillation (ENSO), Indian Ocean Dipole mode (IOD), Indian Ocean Basin mode (IOB), Combined Linear Regression

