

## IOD associated interannual variability of the sea surface salinity in the tropical Indian Ocean

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Based on Argo and satellite sea surface salinity (SSS) data, we analyze the variability of salinity and its related ocean dynamics in the tropical Indian Ocean (IO). The results show significant interannual variability of SSS associated with the Indian Ocean Dipole (IOD) mode in the equatorial IO. Satellite well captures the SSS variations and generally provides SSS maps with higher space-time resolution, particularly in the regions where Argo floats are sparse. The salinity anomalies are mainly due to the adjustment of the tropical circulation, which is strengthen (weakened) by equatorial current anomaly and ocean gyre in the southern IO during negative (positive) IOD event. We find a SSS dipole in the southern IO through the analysis of ten-year Argo SSS data. The SSS anomalies near the equatorial region and that in the southern region is opposite. The SSS dipole is mainly associated with strong Indian Ocean dipole (IOD) events, especially which occurred with El Nino Southern Oscillation (ENSO). The equatorial current and precipitation anomalies associated with IOD dominate the SSS anomalies in the northern and southern parts of the dipole respectively. Ocean Rossby wave associated with ENSO contribute to the maintenance of the SSS dipole.

Keywords: sea surface salinity, interannual variability, SSS dipole, IOD, Rossby wave, tropical ocean circulation