

Long-term modulation of the quasi-decadal scale variation in the tropical Pacific during the 1990s and 2000s

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To explore a low-frequency-modulation of ENSO-like quasi-decadal (QD)-scale variation in the tropical Pacific, relationship between QD-scale modulation and inter-annual scale variation (i.e., El Nino, El Nino modoki, La Nina, and La Nina modoki) is compared between the 1990s and 2000s. QD-scale sea surface temperature (SST) anomaly averaged in the central equatorial Pacific (i.e., Nino-3.4 region) is used for the index of the QD-scale variation. Periods of the positive values of the index are defined as the "QD positive period" in this study. QD-scale SST anomalies averaged over QD positive period in the 2000s show stronger positive and weaker negative values in the central equatorial Pacific and Philippine Sea than the 1990s, respectively. The spatial pattern is similar to the El Nino modoki, as pointed out in previous studies. To explore a relationship between such QD-scale modulation and inter-annual scale variation, composite analyses are conducted. A composite map for inter-annual SST anomalies during El Nino and El Nino modoki periods within the QD positive period of the 1990s shows stronger positive SST anomalies in the central equatorial Pacific and stronger negative SST anomalies in the Philippine Sea than the 2000s. A composite map for La Nina and La Nina modoki during QD positive period of the 1990s shows negative SST anomalies both in the central equatorial Pacific and Philippine Sea. On the other hand, a composite map for La Nina and La Nina modoki during QD positive period of the 2000s shows weak negative SST anomalies in the central equatorial Pacific and positive SST anomalies in the Philippine Sea, in contrast to the 1990s. Such differences in SST anomalies of El Nino/El Nino modoki and La Nina/La Nina modoki between the 1990s and 2000s may lead the QD-scale modulation of SST anomalies during the 1990s and 2000s. In addition to those results, analyses results of temperature profiles obtained along 137E repeated line conducted by JMA and atmospheric reanalysis data will be showed in the presentation.

Keywords: quasi-decadal scale variation, El Nino/Southern Oscillation, tropical Pacific