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Interdecadal chagens in the 30-70 day variation over the South China Sea

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Wavelet analysis of convective activity measured by OLR from 1979 to 2003 has shown that the dominant periodicity of the 30-70-day variation during the boreal summer over the South China Sea (SCS) ranged between 40 and 70 days (called the L-year) and between 30 and 60 days (called the S-year). Many previous studies have considered the 30-70-day variation to be fixed. This study presents di_erences of peak period and mean spatial structure associated with the ISV for L-years and S-years. In 1980, 1984 and 1985, years defined as L-years, the power spectrum peak was in a band between 40 and 70 days (centered on 55 days). In 1979, 1996, 1998, 2000 and 2001, years defined as S-years, that peak was in a band between 30 and 60 days (centered on 45 days).

The mean spatial structure of the intraseasonal variability (ISV) in L-years differed from that in S-years, even though northward and eastward movement characterized the ISV structure in both two periods. In the mature phase of the L-year, enhanced convection anomalies over the SCS were accompanied by suppressed convection anomalies over the Arabian Sea (AS) and Indian sub- continent, which was east-west asymmetric pattern of OLR anomalies along the latitudal band nearby 10_N. Moreover, a quadratic pattern was conspicuous in OLR anomalies over the Indian Ocean and maritime continent in transition phase. In S-years, in contrast, enhanced convection anomalies over the SCS were accompanied by suppressed convection anomalies over the southeastern Indian Ocean. The banded structure of OLR anomalies from the western Pacific to the AS was remarkable during transition phase.

Thus, the 30-70-day variation shows two different spatial structures. The L- year ISV appeared in 1980s, whereas the S-year ISV occurred in 1979 and after 1990. An interdecadal changes in the 30-70-day variation occurred between 1980s and 1990s. Interdecadal change processes, including how the time scale is determined, are interesting issues warranting further examination.

Keywords: intraseasonal variability; interdecadal change; periodicity; quadratic pattern; banded structure