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27-day variation in cloud amount in the Western Pacific warm pool region and relationship to the solar cycle

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Abstract. Although linkages between solar activity and the earth's climate have been suggested and the 11-year cycle in solar activity evident in sunspot numbers is the most examined example of periodicity in previous studies, no quantitative evidence indicating a relationship for tropospheric phenomena has been found for a short period. Based on FFT analysis for OLR (Outgoing Longwave Radiation) compared with the F10.7 index, we clearly demonstrate a 27-day variation in the cloud amount in the region of the Western Pacific warm pool, which is only seen in the maximum years of 11-year solar activity. The average spectrum in such years also shows an enhancement in the range of the MJO (Madden-Julian Oscillation) period. Although there exist some explanations for possible mechanisms, the exact cause is unknown. Therefore, the proposed connection between 27-day cloud variation and solar cycle in the WPWP region is still a hypothesis and various kinds of verification based on other meteorological and solar parameters are strongly required.

[Final Revised Paper](#) (PDF, 1864 KB) [Discussion Paper](#) (ACPD)

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