

## 5-day variation of equatorial convective activity over 100-105E and its influence on the upper troposphere and stratosphere

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A case study of the 5-day-period variation in convection over the maritime continents, and its influence on stratospheric waves and the stratospheric-tropospheric exchange during November-December 2001, by using satellite and in-situ data. Convections associated with circulation anomalies over the observational sites at 100-105E (Sumatra and Singapore), are modulated by enhanced tropical depression (TD)-type disturbances and the intrusion of cold surge. The dominant 5-day-period of disturbances over the observational sites may be determined by geographical distribution, that is, horizontal wavelength and phase speed of generated disturbances. Variations in zonal and vertical wind, and relative humidity

from the Equatorial Atmospheric Radar (EAR) and Singapore radiosonde are well consistent with disturbances coupled with convection.

Convection over the sites is accompanied with lower tropospheric easterly and high humidity, upper tropospheric westerly.

A total agreement between variations in convection and the equatorial Kelvin waves with a period of 5 days and wavenumber 4 in the stratosphere suggests that intensified convections over the sites can generate the observed stratospheric Kelvin waves.

An intriguing coincidence of cold anomalies of the Kelvin waves and the occurrence of tenuous cloud obtained from the Halogen Occultation Experiment (HALOE) emphasizes that convectively generated equatorial Kelvin waves can dehydrate in the tropical tropopause layer (TTL).