

4.017 Intraseasonal Oscillation of Tropospheric Ozone in the Summer Monsoon Region.

Early Career Scientist

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Abstract:

Boreal summer intraseasonal oscillation (BSISO) of tropospheric ozone has been observed in Indian summer monsoon (ISM) region and South China Sea summer monsoon (SCSSM) region. There are two types of BSISO in tropospheric ozone: 30–60 days variation with northeastward propagation in ISM region, and 10–30 days variation with northwestward propagation in SCSSM region. The northward propagation of 30–60 days variations of ozone is blocked by Tibetan Plateau in ISM region, however in SCSSM region, the 10–30 days variations of ozone could propagate much further to 40°N without any topographic countercheck. With the northeastward propagation of enhanced/suppressed convections, these negative/positive tropospheric ozone anomalies successively pass through eastern Indian Ocean, Maritime Continent, Bay of Bengal, South China Sea and Western North Pacific.

Most of active (break) ISM events occur when suppressed (enhanced) 30–60 days convections appear over equatorial Indian Ocean and enhanced (suppressed) convections appear over India, Bay of Bengal and South China Sea. As a result, 30–60 days variation of tropospheric ozone shows significant positive/negative anomalies over eastern Indian Ocean and Maritime Continent in active/break period of ISM. Similarly, the most active (break) SCSSM events occur when 10–30 days enhanced (suppressed) convections are over Philippine Sea and South China Sea. Therefore, the negative and positive 10–30 days variation of tropospheric ozone is observed over South China Sea in active and break periods of SCSSM respectively. Both the 30–60 days intraseasonal variation of ozone in eastern Indian Ocean and Maritime Continent region and 10–30 days intraseasonal variation of ozone over South China Sea accounts for more than 30% of ozone anomaly in active and break periods of ISM and SCSSM.