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梅雨与北极涛动及平流层环流异常的关联

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摘要 平流层过程如何影响气候变化是一个大家关注的科学问题，在WCRP中专门设置了一个研究子计划SPARC.本文的分析研究表明，中国的梅雨异常可能受到平流层大气环流异常的影响，而这种影响是通过北极涛动（AO）的变化来实现的.从分析和计算结果可以看到，二月份北半球30 hPa位势高度的EOF第一主分量对应着副热带和高纬度地区的显著下传异常波作用量，其第三主分量对应着极地地区的显著下传异常波作用量，这些下传的异常波作用量都对三月份AO形势的形成有明显的贡献.三月份的AO则会通过影响东亚地区夏季对流层大气的冷暖状况和环流，在长江中下游地区导致异常垂直运动和辐散辐合形势，从而影响夏季的梅雨降水.

关键词 梅雨 北极涛动（AO） 平流层 环流异常
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Mei-yu, Arctic Oscillation and stratospheric circulation anomalies

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Abstract How about the influence of stratospheric process on the climate as a scientific problem has been paid more attentions in the world. So that there is a special subproject-SPARC in the WCRP. Based on the data analyses, it is shown in this paper that mei-yu precipitation may be influenced by the stratospheric atmosphere circulation anomaly through the Arctic Oscillation (AO) in the troposphere. The stratospheric atmosphere circulation in February is closely related to the AO in March. It may affect the AO through the downward propagating wave activity anomalies. The EOF1st and EOF3rd leading modes of 30hPa geopotential height in February are significantly associated with anomalous downward E-P flux in the subtropics and the polar region, respectively. The AO in March may in turn exert an influence on summertime circulation in East Asia, which is closely related to the summertime thermal condition of the tropospheric atmosphere over East Asia. The changes of thermal condition and the circulation over East Asia can then lead to anomalous convergence/divergence in Yangtze River Valley, and the anomaly of mei-yu precipitation.

Key words Mei-yu; Arcti oscillation (AO); Stratosphere; Circulation anomaly

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