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论文

耦合模式长期积分中东亚夏季风与ENSO联系的不稳定性

姜大膀

1 南京师范大学地理科学学院，南京 210097 2 南京大学大气科学系，南京 210093

摘要： 通过对挪威卑尔根全球大气-海洋-海冰耦合模式300a控制积分结果进行交叉子波分析，揭示了东亚夏季风（EASM）与同期Nio3区（90°W～150°W，5°S～5°N）海洋表面温度异常的相关关系在长期变化中是不稳定的，呈现出明显的阶段性特征.气候要素场在二者联系的紧密（HCP）和微弱（LCP）时期差别显著，在HCP时期，西北太平洋对流层低层出现一对耦合的异常气旋和反气旋性环流系统；东南亚地区对流层低层表现为强东风异常，风速的年际变率加大；热带西太平洋对流层温度和位势高度场的年际变率普遍加强.此外，中国夏季降水与同期Nio3区海洋表面温度异常的相关关系在上述两种时期也存在较大差别.

关键词： 耦合模式 东亚夏季风 ENSO 不稳定性

Instability of the East Asian summer monsoon ENSO relationship in a coupled global atmosphere ocean GCM.

JIANG Da Bang[1]

1 Department of Geography, Nanjing Normal University, Nanjing 210097, China 2 Department of Atmospheric Sciences, Nanjing University, Nanjing 210093, China

Abstract: We use a 300 years control integration of a coupled global atmosphere ocean sea ice general circulation model (GCM)

to study the relationship between the East Asian summer monsoon (EASM) and the ENSO (El Nio and Southern Oscillation) cycle by applying cross wavelet analysis. Our result reveals that the correlation between EASM and ENSO may break down on inter decadal time scales. Furthermore, the characteristics of climatic variables during their high correlation periods (HCP) are quite different from those during the low correlation periods (LCP). Notably, the HCP is characterized by an anomalous low tropospheric cyclone coupled with an anticyclone circulation over the western North Pacific and by a board band of strong low tropospheric easterly wind anomalies located from the Philippines to the Bay of Bengal. For HCP, large inter annual variability is founded in the low tropospheric wind velocity over southeast Asia and in the tropospheric temperature and geopotential height over the tropical western Pacific. In addition, the correlation pattern between summer precipitation in China and simultaneous Nio3 region sea surface temperature anomalies are significantly different during the HCP and LCP.

Keywords: Coupled GCM East Asian summer monsoon ENSO Instability.

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