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论文

### El Nino演变不同阶段东亚大气环流 年际异常型的数值模拟

孙旭光, 杨修群

南京大学灾害性天气气候研究所, 南京210093

**摘要:** 给定1948~1999年逐月变化的全球观测的海表温度分布, 使用全球大气环流模式 (CCM3/NCAR) 模拟了大气对海表温度变化的响应, 利用SVD和合成检验方法, 分析了El Nino发展阶段夏季、成熟阶段冬季以及衰亡阶段夏季东亚大气环流的年际异常型.结果表明: El Nino发展阶段夏季, 中国东北、朝鲜半岛以及日本海附近为高度负异常中心, 西太平洋副高偏弱、偏东, 东亚夏季风增强; El Nino成熟阶段冬季, 东亚大槽加强, 东亚北部冬季风加强; El Nino衰亡阶段夏季, 西太平洋副高偏强、偏南、西伸, 东亚夏季风减弱; El Nino事件在其衰亡阶段夏季与东亚大气环流异常的关系最紧密, 其次是成熟阶段冬季, 最后是发展阶段夏季.模拟的El Nino演变不同阶段东亚大气环流年际异常型易于解释以往研究中观测分析揭示的由El Nino造成的我国东部气温和降水异常型.

**关键词:** El Nino 东亚大气环流 副热带高压 东亚季风

Numerical modeling of interannual anomalous atmospheric circulation pattern over East Asia during different stages of an El Nino event

SUN Xu Guang, YANG Xiu Qun

Institute of Severe Weather and Climate, Nanjing University, Nanjing 210093, China

**Abstract:** We make numerical modeling for the response of global atmosphere to the

扩展功能

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prescribed realistic monthly varying global sea surface temperature during 1948~1999 with an atmospheric general circulation model (CCM3/NCAR). Then we analyze interannual anomalous atmospheric circulation patterns over East Asia during different stages of an El Nino cycle, with the SVD and composite analysis methods. The result shows that during the summer when an El Nino event develops, there exists an anomalously negative geopotential height center over Northeast China, the Korean peninsula and the Sea of Japan. The subtropical high over the western Pacific is weaker and shifts eastward, and East Asian summer monsoon is strengthened. During the winter when an El Nino event is matured, the East Asian trough is deepened, resulting in a strengthened winter monsoon over the north of East Asia but a weakened one over the south. During the summer when an El Nino event decays, the subtropical high over the western Pacific is stronger and shifts southward and westward, and the East Asian summer monsoon is weakened. There is a closest relationship between the El Nino event and atmospheric anomalies in East Asia only during the summer when the El Nino event decays. Overall, the simulated atmospheric anomaly patterns over East Asia due to El Nino's impact can reasonably explain the observed temperature and precipitation anomaly patterns that were described in previous studies.

Keywords: El Nino Atmosphere circulation in