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Interannual Variability of the Eastern Asian Summer Monsoon: Simulation and Observation

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Eastern Asian summer monsoon (EASM) is a very complex system that changes with a wide range of spatial and temporal scales. Many studies showed that there are some factors that may contribute to the seasonal and interannual variations of the EASM. To identify interannual variations of EASM, precipitation data from 160 stations in China was used for comparison with the modeling output, which is from an atmosphere-ocean coupled global climate model ECHO-G. The sea level pressure, velocity potential at 200hPa, u-v components at 850hPa and 700hPa are also analyzed based on NCEP re-analyzed data and simulated results. The results show that during the last 50 years, the simulations of monthly precipitation and the time-latitude cross section of rainfall zone have a regular movement from south to north in first 35 years. While for last 15 years, the rainfall zone extended from south to north during summer time. The simulation of ECHO-G shows that summer rainfall (Meiyu in Yangtze River reach) has significant interannual variation and gives some heavy rainfall years, which means that interannual variation of EASM is well reproduced by ECHO-G. Both observation and simulation show that the temporal and spatial distributions of monsoon precipitation in eastern China have been changing for last 10 to 20 years.