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Multi-time Scale Characters of Asian Monsoon System from ECHO-G Simulation

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The Asian monsoon system changes in the multiple time scales. In order to explore this character, wavelet analysis is used in this study based on the ECHO-G long time simulation. The WY monsoon intensity index (M2), Lau's monsoon intensity index (RM2) and monthly summer precipitation is calculated from the model outputs. The results show that RM2 has three periods in 2 years, 7 years and 25 years. 2-year period is significant in all time series. M2 also shows three periods that are similar with RM2 and 2~3 year period appeared in all timescales while 25-year period is the most significant one. The wavelet analysis of summer precipitation indicates a strong 25-year period and a clear 6~7 year period. From complex wavelet analysis of RM2, M2 and precipitation we find that the power spectrum area is concentrated in 2 years and 6~7 years while it is not strong in 25 years. It is clear that the most significant power spectrum is in the 2-year period, and second one is 7-year period. We can conclude that from ECHO-G simulation, eastern Asian monsoon has a multiple time scale variation and the most significant period is 2 years. 7 years and 25 years are the other two main periods but they are weaker than 2-year period.