

World Conference on

Climate Change

October 24-26, 2016 Valencia, Spain

Evolutions of the circulation anomalies and the quasi-biweekly oscillations associated with extreme heat events in South China

Ruidan Chen

Sun Yat-sen University, China

South China, located in the tropical-subtropical East Asian monsoonal region, presents a unique anticyclonic-cyclonic circulation pattern during extreme heat (EH), obviously different from the typical anticyclone responsible for EH in many other regions. Associated with the evolution of EH in South China, the anticyclonic-cyclonic anomalies propagate northwestwards over the Philippines and South China. Before the EH onsets, the anticyclonic anomaly dominates South China, and results in stronger subsidence over South China and stronger southerly/southwesterly over the western/northern margins of South China. The southerly/southwesterly transports more water vapor to the north of South China, and together with the local stronger subsidence result in dry air condition and accordingly favor the EH occurrence. Conversely, after the EH onsets, the cyclonic component approaches South China and offsets the high temperature. The oscillations of temperature and circulation anomalies over South China exhibit a periodicity of ~10 days and indicate the influence of quasi-biweekly oscillation (QBWO), which originates from the tropical western Pacific and propagates northwestwards. Therefore, the 5–25-day filtered data are extracted to further analyze QBWO. It turns out that the evolutions of the filtered circulation remarkably resemble the original anomalies with comparable amplitudes, indicating the QBWO is critical for EH occurrence. The QBWO could explain for 50% of the intra-seasonal variance of T_{\max} and vorticity over South China, and 70% of the warming amplitude on EH onsets. The close relationship between the circulations of QBWO and the EH occurrence indicates the possibility of medium-range forecast for high temperature in South China.

Biography

Ruidan Chen has completed her PhD from the Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing, China. She is a lecturer in Sun Yat-sen University School of Atmospheric Sciences, Guangzhou, China. She has published 7 papers in reputed journals.

chenrd3@mail.sysu.edu.cn

Notes: