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The dominant patterns of the precipitation in China during the boreal winter and their relationship with 30-60-days intraseasonal oscillation

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With the daily rainfall data from the National Meteorological Information Center of China and the National Centers for Environmental Prediction National Center for Atmospheric Research (NCEP-NCAR) reanalysis data, variability of the precipitation field during the boreal winter in China from 1979 to 2011 and its relationship with the 30-60-days intraseasonal oscillation activity is investigated in this study. It is shown that the distribution of the precipitation during the winter season (DJF) in China is featured by two typical patterns. The first one is characterized by the uniformly enhanced rainfall over the South China, and the second one is represented by meridionally banded dipole-like structure with the more or less precipitation changing alternatively between the Yangtze River Basin and the South China. The 30-60-day periodicity is found to contribute mostly to these two distribution patterns. The leading uniform pattern of the filtered precipitation with 30-60-day periodicity over the South China is closely related with the wavelike pattern of Pacific/North American (PNA) pattern, which is coupled with the dipole distribution pattern of the tropical convection, and with the convective center elongating from tropical Indian Ocean to Phillipine. The dipole-like pattern of the 30-60-day filtered precipitation is related to the North Pacific Oscillation (NPO) and the Pacific-Japan (PJ) teleconnection pattern, and to the tripole pattern of tropical convection centering at tropical Indian Ocean, Phillipine and tropical western North Pacific respectively. It is suggested that the enhanced precipitation over the South China or Yangtze River Basin induced by the intensified southwesterlies flow is the result of the interaction between the southward movement of the middle and high latitude 30-60-days oscillation and the northward movement of the tropical convection in these areas during the boreal winter.