



Concurrent variation of subtropical and polar jet over East Asia in winter

Yaocun Zhang and Chuliang Xiao
(yczhang@nju.edu.cn)

Abstract: In the upper troposphere and lower stratosphere, there exist two branches of narrow and strong jet streams with large horizontal and vertical wind shears over East Asia, which are referred to the East Asian subtropical jet and polar jet (or temperate jet). Accompanying the transition of atmospheric circulation during the period of pre-onset to post-onset of the East Asian monsoon, the jet stream is characterized by prominent seasonal evolutions in the intensity and location, and intimately related to the monsoon climate in East Asia. Thus the upper level jet stream is an important system affecting the weather and climate in East Asian monsoon region. The concurrent variation of subtropical and polar jet over East Asia in winter is examined in this study, using the NCEP/NCAR reanalysis data. It is found that the subtropical jet and polar jet are negatively correlated in winter season over East Asia, which means that when subtropical becomes strong, polar jet weak, vice versa. This concurrent variation corresponds to different middle and high latitude circulation patterns in northern hemisphere and different weather and climate conditions in eastern China. This concurrent relationship between subtropical jet and polar jet may be used as a precursor for the prediction of the middle and high latitude circulation transition over East Asia in boreal winter.

Keywords: Concurrent variation, Subtropical and polar jet, Weather and climate effect, East Asia.