



## **Impact of tropical sea surface temperature on the interannual variability and its decadal variation of Pacific-Japan pattern**

X. Chen (1,2) and T. Zhou (1,3)

(1) LASG, Institute of Atmospheric Physics, Beijing, China (zhoujt@lasg.iap.ac.cn), (2) Graduate University of the Chinese Academy of Sciences, Beijing, China (chenxiaolong@mail.iap.ac.cn), (3) Climate Change Research Center, Chinese Academy of Sciences, Beijing, China

The interannual variability and its decadal variation of Pacific-Japan (PJ) pattern during 1979-2008 are investigated using NCEP/DOE reanalysis data (NCEP2) and the AMIP-run results of two atmospheric models, SAMIL2 and ECHAM6. The leading EOF mode of 850hPa vorticity in boreal summer is used to represent PJ pattern. Power spectra and wavelet analyses reveal that the interannual variability of PJ pattern is dominated by two oscillations, 4-5 years and 2-3 years, before and after 1992 respectively. The decadal shift point can be captured by the two models but depends on the model sensitivities to different tropical sea regions. SAMIL2 significantly responds to the SST anomalies of the maritime continent and western-central Pacific, while ECHAM6 is sensitive to tropical Indian Ocean SST anomalies. The single peak of 3-6 years and 2-3 years oscillation are found in the variability of tropical western Indian Ocean and maritime continent SST before and after 1992 respectively. The simulated PJ patterns show single peak of 2-3 years oscillation in SAMIL2 after 1992 but a stronger 4-5 years oscillation in ECHAM6. In the assumption that the variability of atmosphere in AMIP run mainly comes from prescribed SST, the tropical western Indian Ocean is determined to be responsible for the 4-5 years oscillation of PJ pattern and the maritime continent for the 2-3 years with reasonable circulation mechanisms. In addition, the western-central Pacific SST anomalies could contribute to the variability of PJ pattern after 1992. In the perspective of AMIP run, the ENSO in the previous winter can more affect the PJ pattern variability of 4-5 years through Indian Ocean than that of 2-3 years through maritime continent in boreal summer.