



## **Change in early-summer meridional teleconnection over the western North Pacific and East Asia around the late 1970s**

Z. Lin, R. Lu, and W. Zhou

Institute of Atmospheric Physics, Chinese Academy of Sciences, China (zclin@mail.iap.ac.cn)

Previous studies showed that during summer, there is a meridional teleconnection over the western North Pacific and East Asia (WNP-EA) on the interannual time scales. This meridional teleconnection is characterized by the zonally elongated circulation anomalies with alternate signs in the meridional direction over this region. The present study indicates that there is a significant change in the early-summer meridional teleconnection around the late 1970s, by using ERA-40 reanalysis data during 1958-2001. Although this meridional teleconnection appears as a dominant mode during the whole analyzing period, a close inspection revealed that the teleconnection becomes obscure considerably after the late 1970s. Before the late 1970s, the meridional displacement of the East Asian upper-tropospheric jet stream (EAJS), which is the most dominant mode of EAJS interannual variability, has a statistically significant relationship with both the zonal shift of the WNP subtropical high (WNPSH) and rainfall anomaly in the tropical WNP. After the late 1970s, however, this tropical-extratropical interaction over the WNP-EA is disrupted. We hypothesize that this change in meridional teleconnection is due to the weakening of vertical easterly shear over the tropical WNP in June after the late 1970s. Before the late 1970s, the easterly vertical shear permits the coupling of external mode and internal mode excited by the tropical WNP precipitation anomaly, and results in a significant barotropic response, which is necessary for the meridional teleconnection over the WNP-EA. After the late 1970s, the near-zero vertical shear is unfavorable for the coupling and thus weakens the meridional teleconnection.