Using NCEP/NCAR reanalysis and precipitation records of Chinese stations, we have investigated the relationship of interhemispheric oscillation of air mass (IHO) with global lower-level circulation and monsoon anomalies in boreal summer. Our results show that the summer IHO explains greater portion of variance of the abnormal distribution of atmospheric mass over 30°S-60°N as well as the Antarctic. It is shown that IHO has some influences on both the atmospheric mass transports and water vapor fluxes over 30°S – 60°N in association with three anomalous cyclonic circulations over the land of the eastern hemisphere, which is in close relation to the changes in summer monsoon intensity in eastern Asia and western Africa. Composites analysis indicate that eastern Asian summer monsoon is more intense with positive precipitation anomaly centers in northern and northeastern parts of China as opposed to the negative center over the mid-lower reaches of Yangtze river (MLRYR) in high IHO index years. In low IHO index years, feeble summer monsoon appears in eastern Asia, leading to positive center of precipitation anomalies displaced into the MLRYR. Besides, a teleconnection in wind fields between the western African and eastern Asian monsoon regions is observed in the middle and higher troposphere in the scenario of IHO. The anomalous cyclonic (anticyclonic) circulations along the path of this Africa-East Asia teleconnection are found to be just over the diabatic heating (cooling) centers, suggesting that the diabatic forcings be responsible for the formation of this Africa-East Asia teleconnection.

Keywords: interhemispheric oscillation; Asian monsoon; precipitation, China, boreal summer