Geophysical Research Abstracts
Vol. 17, EGU2015-8252, 2015
EGU General Assembly 2015

analysis of spatial-temporal variations and driving force of low cloud in northern China

xiaorui niu and Shuyu wang
China (niuxr@nju.edu.cn)

Cloud plays a crucial role in the climate system, and better understanding of its characteristics and formation mechanism are essential to study the climate system, improve the performance of climate models, and to provide scientific basis on conducting weather modification activities and better using water resources for the purpose of improving the local climate and ecological environment. During 1961 to 2005, decrease trend is detected for the total cloud amount over most parts of northern China, while increase trend is found for the low cloud amount with significant regionality. Both station and ISCCP D2 datasets present similar spatial distributions and interdecadal variation of high cloud. However two datasets show different characters for those of low cloud. Three typical sub-regions are chosen considering their underlying surface features and the temporal trend of low cloud amount, over which the interdecadal variations of low cloud amount in three regions are systematically investigated. The analyses show the strong regionality and seasonality in low cloud amount's temporal variations and trend, and quasi-biannual oscillations are observed in low cloud amount in three regions in the past 45 years. The relationships between 500 hPa circulation indexes and low cloud over the three regions are examined by means of singular value decomposition (SVD). The results show that the summer low cloud amount in Xinjiang is closely related with the Subtropical High, the Tibetan Plateau and Polar Vortex, and the autumn low cloud amount in North China is affected by the area of Subtropical High and intensity of Polar Vortex. For northeast China the controlling factor that affects the spring low cloud amount is the area of Polar Vortex in quadrant [U+2173][U+FF08]30°W-60°E[U+FF09].