



Arctic cyclone activities and cold wave events in East China

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As the most sensitive region of global climate change, the Arctic not only affects the local environment, but also is closely related to extreme weathers in the mid-latitudes. In recent years, cyclones frequently invaded the Arctic, causing changes in polar vortices, sea ice, as well as warm and humid air transportation, which in turn affected the accumulation and explosion of coldwave. In this research we will analyze the cold wave events in East China in the past 40 years, and their relationship with the atmospheric circulation anomalies in the Arctic, especially the impacts of Arctic Oscillation and Arctic storm.

The result show that the cold wave activity tend to enhance in early winter while its tendency is insignificant during 1979-2018. In addition, cold wave activity in early and late winter show opposite phase in the recent decade. The Arctic Oscillation could indicate the inter-annual variation of cold wave activity, as represented by their negative correlation, but is unable to explain the positive trend of cold wave events in early winter. We define an Arctic storm index DET_CAI, which describes the different Arctic storm activities between East and West Hemisphere. DET_CAI switch from negative phase to positive phase after 2005, which contribute to the intensification of early winter cold wave in recent years.