



A change of large-scale circulations in the Indian Ocean and Asia since 1976/77 and its impact on the rising surface temperature in Siberia

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This study examines the changes of an interdecadal circulation over the Asian continent to find cause of the surface warming in Siberia from 1958 to 2004. According to our study, there is a coherency between a long-term change of sea surface temperature in the Indian Ocean and the rapid increase of air temperature in Siberia since 1976/1977. In this study, we suggest that mean wind field changes induced by the positive sea surface temperature anomalies of the Indian Ocean since 1976/1977 are caused of inter-decadal variations in a large-scale circulation over the Asian continent. It also indicates that the inter-decadal circulation over the Asian continent is accompanied with warm southerly winds near surface, which have significantly contributed to the increase of surface temperature in Siberia. These southerly winds have been one of the most dominant interdecadal variations over the Asian continent since 1976/1977. In addition, we investigated the long-term trend mode of 850 hPa geopotential height data over the Asian continent from the Empirical Orthogonal Function (EOF) analysis for 1958-2004. In result, we found that there was an anomalously high pressure pattern over the Asian continent, it is called 'the Asian High mode'. It is thus suggested that the Asian High mode is another response of interdecadal changes of large-scale circulations over the Asian continent.