



Abstract

Global Trends in the Occurrence and Characteristics of Blocking Anticyclones Using Sen Innovative Trend Analysis [†]

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Abstract: Atmospheric blocking plays an important role in modulating mid-latitude weather, in particular in the Northern Hemisphere (NH). Trend analysis of atmospheric blocking for both hemispheres by using Sen's Innovative Trend Analysis (ITA) is performed in this study. The blocking data archived in the University of Missouri covers the period of 1968–2019 for the NH and 1970–2019 for the Southern Hemisphere is used in the study. Block occurrence, duration and blocking intensity (BI) is analysed by classifying the NH (and SH) into three groups according to the preferred blocking locations: Atlantic, Pacific and Continental (Atlantic, Pacific and Indian). In the NH, blocking intensity showed mixed results. It showed a decreasing trend for the entire hemisphere and Atlantic Region, whilst a different trend was shown for different BI clusters. For blocking numbers and duration, the entire hemisphere and regions showed increasing trends. These increasing trend values were also statistically significant. In the SH, blocking intensity showed a decreasing trend for low clusters, whilst medium and high cluster increased for the entire hemisphere. Block duration showed an increasing trend for the entire SH. Block numbers showed increasing trends, except for one point in the low cluster. Blocking characteristics showed different trends for different preferred blocking locations. Increasing trends of blocking numbers for the overall SH and Pacific region are statistically significant at 95% level. Increasing trends of blocking duration for the overall SH, Atlantic and Pacific region are statistically significant at 90%, 95% and 95% level, respectively.

Keywords: block intensity; block duration; blocking trends; climatology; blocking anticyclones



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