

SCALE AND STABILITY ANALYSIS OF SELECTED ATMOSPHERIC BLOCKING EVENTS

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ABSTRACT

Global six year climatology of mid latitude atmospheric blocking events, during the period 1999-2004, is presented based on the scale and stability analysis, using the NCEP/NCAR re-analysis data. A total of 278 blocking events over the Northern as well as the Southern Hemispheres are analyzed.

It is pointed out that globally, over the six year period, 83% of the blocking events have single-scale dominance, whereas remaining 17% of the blocking events have an alternating-scale dominance behavior. In the Northern Hemisphere, during the later half of the six year period, a 28% rise in the planetary-scale dominance behavior blocking events is noticed over the synoptic-scale dominance behavior blocking events.

A comparison of the time variability of the three stability indicators over the entire life cycle of the selected blocking events with earlier works performing the synoptic and dynamics studies shows that the three stability indicators can be used as climatologically reliable stability indicators giving useful insight into the stability of the flow attending the blocking event. It is noticed that in the scale dependent flow, the scale that dominates during the mature stage of the blocking event determines the stability of the flow during the blocking, and that the blocking is relatively more stable state than the more frequent zonal flow, irrespective of which scale dominates the flow during blocking.