



On the development and persistence of strong ridge episodes over the eastern North Atlantic

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The occurrence of strong and persistent mid-latitude anticyclonic ridges over the Eastern North Atlantic is a major contributor to the occurrence of severe winter droughts over Western Iberia. We analyze the development of strong and persistent ridge episodes within 40–50 N; 40 W–5 E, which are defined as 250 hPa geopotential height anomalies above a specific threshold that persist for at least 10 consecutive days. Results suggest that the generation and maintenance of these episodes, with positive stratospheric geopotential anomalies over the North American continent and the adjacent North Pacific, are associated with an intensified polar jet. Such positive anomalies tend to detach from the main stratospheric anomaly and propagate eastwards and downwards as Rossby tropospheric waves. Furthermore, the Eastern North Atlantic ridge is generated and repeatedly reinforced until the stratospheric anomaly dissipates. Results also show that the occurrence and maintenance of these episodes is associated with anticyclonic wave breaking over the eastern north atlantic, which is dynamically coherent with their persistency and quasistationarity.