



Persistent Circulation Regimes and Preferred Regime Transitions in the North Atlantic

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The persistent regime behavior of the eddy-driven jet stream over the North Atlantic is investigated. The North Atlantic jet stream variability is characterized by the latitude of the maximum lower tropospheric wind speed of the ERA-40 reanalysis data for the period 1 December 1957 through 28 February 2002. A Hidden Markov Model (HMM) analysis reveals that the jet stream exhibits 3 persistent regimes which correspond to northern, southern and central jet states. These regimes are related to the North Atlantic Oscillation and the East Atlantic teleconnection pattern. The regime states are associated with distinct changes in the storm tracks and the frequency of occurrence of cyclonic and anti-cyclonic wave breaking. Three preferred regime transitions are identified. The preferred transitions correspond to a poleward motion of the jet stream. We will discuss the role of Rossby wave breaking in the regime transitions, the variability of the regimes on interannual time scales and the predictability characteristics of the regimes.