

Public Abstract

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Title:NEIGHBORING UPPER LEVEL JET STREAKS, THEIR PROXIMITY, AND THEIR SYNERGESTIC COUPLING OF THE DIVERGENT REGIONS

A reoccurring question when diagnosing the upper troposphere is: How close is close enough for jet streaks to be considered coupled? The phrase, 'coupled jet streaks' refers to two individual jet streaks working synergistically to impact the weather. Jet streaks are isotach maxima that occur within a jet stream. This question beseeches an answer because coupled jet streaks can be the driving force behind significant precipitation events, and powerful mid-latitude cyclones. The answer to question was found by testing if the individual jet streaks were within the Rossby radius of deformation of one another. The Rossby radius of deformation is the effective distance from the location of a disturbance to the region in which the effects of the disturbance are negligible. In other words a disturbance will impact anything within its Rossby radius of deformation including other disturbances. The Rossby radius of deformation buffers showed that all jet streak cases reviewed had a Rossby radius of deformation overlap zone (RRDOZ), meaning that both streaks in each case were influencing one another just by their proximity. To confirm this all of the cases were then investigated via cross section to see if there was coupled transverse ageostrophic circulations. This confirmed jet streaks to be coupled. The RRDOZ area was then explored to see if there was a relation between the area of the RRDOZ and the areas of the significant omega and precipitation polygon areas. A relationship between the significant omega areas and the significant precipitation area was shown to exist. Based on the results obtained from this study forecasters should consider jet streaks coupled if they exist within 2272 km of one another. Additionally the area covered by the RRDOZ is a good first estimation for precipitation.