

Quasi-disruptions of the QBO: Tropical Wave Activity of 1987-88 and 2010-11 compared to the 2015-16 NH Winter

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The Quasi-Biennial Oscillation (QBO) experienced an unprecedented disruption during the Northern Hemisphere (NH) winter of 2015-16 in which the typical descending westerly winds were anomalously split by easterlies associated with stronger than average wave activity (latitudinal momentum flux convergence). We examine the QBO forcing over the 1980-2016 time period and find that the NH winters of 1987-88, and 2010-11 also had larger than average horizontal momentum flux convergence in the tropics and that these increased-wave-forcing events were associated with a transient reduction, but not a reversal, of the QBO westerly winds. Examination of the differences in wave forcing and zonal mean zonal wind response between these earlier strong events and the 2015-16 disruption highlight some of the unique aspects that led to the 2015-16 disruption.