

The influences of El Nino and Arctic sea-ice on the QBO disruption in February 2016

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The westerly phase of the quasi-biennial oscillation (QBO) was unexpectedly disrupted by an anomalous easterly near 40 hPa (~23 km) in February 2016. At the same time, a very strong El Nino and a very low Arctic sea-ice concentration in the Barents and Kara Sea were present. Previous studies have shown that the disruption of the QBO was primarily caused by the momentum transport of the atmospheric waves in the Northern Hemisphere. Our results indicate that the tropical waves evident over the Atlantic, Africa, and the western Pacific were associated with extratropical disturbances. Moreover, we suggest that the El Nino and sea-ice anomalies in 2016 account for approximately half of the disturbances and waves based on multiple regression analysis of the observational/reanalysis data and large-ensemble experiments using an atmospheric global climate model.

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