

Influence of the abnormal QBO feature during 2015-2016 on the Earth rotation rate

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Since the 90's it is very well known that the El Niño event involves a large inter-annual variation on Earth's rotation rate. In the pioneering work of Dickey et al., (1994) the authors had analyzed Length-Of-Day (LOD) time series, along with Atmospheric Angular Momentum (AAM) and Southern Oscillation Index (SOI) for a 15-year span to evince and corroborate the excitation of the strong 1982-83 El Niño event on LOD. Moreover, the coupled phenomenon of El Niño-Southern-Oscillation (ENSO) was also linked to the stratospheric event known as the quasi-biennial oscillation (QBO). Effectively, several authors (Chao, 1989; Dickey et al., 1994; Chao and Naito, 1995; Liu-Hua et al, 2006) also claim for the influence of QBO effects on the Earth rotation rate superposed to ENSO.

Recently, Newman et al., (2016) reported an anomalous feature in the QBO during the Northern Hemisphere winter of 2015-2016. The expected downward propagation of the westerly phase was modified and there was an anomalous upward displacement from ~ 30 hPa to 15 hPa. According to the authors, this abnormal feature is for the first time observed since 1980. Afterward, Barton & McCormack (2017) linked this QBO feature with the last ENSO phenomenon 2015-2016, that turned out to be one of the strongest ENSO events registered.

The purpose of this work is to investigate the influence of the QBO anomaly detected during the very strong El Niño event 2015-2016 on the observed Earth rotation rate and the associated AAM.

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