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# Brewer-Dobson circulation represented in JRA-3Q

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## Abstract

The Brewer-Dobson circulation (BD circulation) represented in the reanalysis data is known to have differences in structure and strength, although seasonality and asymmetry in the northern and southern hemispheres are common among the reanalyses (Iwasaki et al., 2009). The BD circulation, represented in JRA-55, shows similar characteristics to that in ERA-Interim climatologically, but it has been pointed out that the long-term trend of the circulation strength, indexed by the upward mass flux near the tropopause, shows an increasing trend and is opposite to that of ERA-Interim (Abalos et al. 2015, Kobayashi and Iwasaki, 2016). The Japan Meteorological Agency (JMA) has been conducting the third Japanese global atmospheric reanalysis for Three Quarters of a Century (JRA-3Q). The characteristics of the mean meridional circulation represented in JRA-3Q in recent 30 years, especially the BD circulation, were compared with those in other reanalyses such as JRA-55 and ERA5 (5.1). The results show that the BD circulation represented in JRA-3Q is weaker than that of JRA-55 throughout the year, and the associated tropospheric and stratospheric mass exchange rates are smaller throughout the year. The exchange rates in JRA-3Q are less than ERA5 (5.1) in DJF season and similar in JJA season, indicating a difference in the representation of the Northern Hemisphere cell of BD circulation.

**Keywords:** JRA, Reanalysis Intercomparison, BrewerDobson circulation

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