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Change of Brewer –Dobson circulation and its impact on total ozone in the middle and high latitude stratosphere

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We focus on the changes of the winter Brewer-Dobson circulation with using ERA-Interim reanalysis data. Previous studies based on reanalysis data and total ozone measurements have shown a linear relationship between the winter 100 hPa eddy heat [U+FB02]ux and the high latitude total ozone increase during the winter. This is observed in both hemispheres despite the differences in the wintertime circulations. Interannual changes in the winter Brewer-Dobson circulation have also been identified as being a significant influence on decadal ozone variations over mid-latitudes, particularly in the northern hemisphere. Here we investigate the seasonal and decadal evolution of total ozone in both hemispheres using observations (reanalyses and ozone measurements) in combination with model data at mid and high latitudes for the period 1989-2011. We examine in more detail how the correlation between EP flux and total ozone change varies as a function of latitude region and on sub-seasonal time scales as well as the connection with O_3 changes and the strength in the Brewer-Dobson circulation in mid and high latitudes.