

# **Regional teleconnections revealed by lagged correlations between the Quasi-biennial Oscillation and Ozone concentrations**

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The influence of the tropical Quasi-Biennial Oscillation (QBO) on higher latitudes has been explored since the discovery of the QBO. Often, the QBO is considered to be zonally homogeneous. Commonly, the zonal average of the zonal stratospheric winds and their influence on higher latitudes is used in teleconnection studies. In this study we consider the influence of the zonally varying influence in the longitudinal structure of the QBO on ozone mixing ratios in reanalysis data. We use lagged correlations to analyse ozone data and wind fields of reanalysis data from 1979 to 2017 in order to find potential connections of the QBO with regional ozone. We use ozone data at 300 hPa and lag times of 23, 28, and 33 months for the QBO at 50, 30 and 10 hPa, respectively. Two hitherto not considered potential regions have been uncovered, one over the North Pacific/North American region and another over the Indian Ocean/tropical East Asia. The influence of the QBO on the two different regions show maximum correlations at different lag times for different heights of the QBO, as is to be expected. Also, the two different regions described appear to be occurring at the same lag times. Other lag times and other correlations do not show irregular or unknown behaviour and are therefore not being presented. We discuss possible causes and links to Polar stratospheric warmings or an El Niño Southern Oscillation (ENSO) influence of the QBO.

Key words: QBO, ozone, lagged correlations, teleconnection