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Interactive comment on "Variability and trends in total and vertically resolved stratospheric ozone" *by* D. Brunner et al.

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The following comments are in reference to the authors' discussion in Section 3.1.3 of the 11-year solar cycle signal derived from their ozone analyses.

To provide more context on the issue of solar-QBO interaction, it's worth noting that there have been several observational and modeling studies supporting the initial findings of Salby and Callaghan (2000) regarding a solar cycle modulation of the QBO period. These include McCormack (2003), Pascoe et al.(2005), and Salby and Callaghan (2006).

The solar cycle response in total ozone (Figure 2d) appears to show good agreement with results from an analysis of SBUV total ozone over the 1979-1995 period (McCor-

mack et al., 1997). The study of Hood (1997) attributes the total ozone solar cycle variation observed at low latiudes to a positive lower stratospheric ozone response, arguing that the observed upper stratospheric ozone response does not produce much of an effect on the total ozone column. The present study finds no significant lower stratospheric ozone response at low latitudes. Can this discrepancy be explained by the lower altitude of the peak solar cycle response in Figures 3(d) and 4? It would be useful to plot the total ozone data time series as well as ozone time series at select altitudes to illustrate how well the regression model fits the decadal variability in the data.

The model used by Lee and Smith (2003), discussed later in this section, imposed a QBO variation with fixed period that does not account for any solar cycle modulation of the QBO period, as is observed. When the authors refer to the negative solar signal in lower stratospheric ozone as due to "interference with the QBO and volcanic eruptions in the statistical analysis" of Lee and Smith (2003), it is worth noting that only when the regression analysis of Lee and Smith (2003) used their modeled zonal wind time series was such a negative signal produced. Their modeled zonal wind QBO did not resemble the real zonal wind QBO in that the westerly phase was considerably weaker than the easterly phase. When a more realistic sinusoidal zonal wind variation was used in their regression analysis, the negative lower stratospheric ozone response did not appear. It might be more accurate to state that Lee and Smith (2003) found the negative ozone response to be due to interference between their modeled zonal wind QBO and volcanic eruptions.

Finally, it should be noted that Langematz et al. (2005) uses, in their words, an "idealized" source of NOx in their model simulations. To date, there is no observational evidence to date of a significant solar-cycle variation in NOx that can explain the low latitude ozone response. Is there evidence that medium-energy electron variations are capable of producing such a response?

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