



THE INFLUENCE OF POLAR VORTEX OZONE DEPLETION AT MIDLATITUDES

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Massive ozone depletion inside the polar vortex has frequently occurred during the past decade resulting in dilution of the Northern Hemisphere ozone layer down to midlatitudes. Calculations of the dilution for April and May were performed using diabatic regridded reverse domain-filling trajectory calculations covering the altitude region of the ozone depletion. The average column depletions for April and May have been calculated for years 1993, 1995, 1996, 1997 and 2000. This includes the years with most Arctic ozone depletion.

Satellite measurements have shown that the midlatitude ozone depletion in the Northern Hemisphere spring varies with longitude. Here we show that these longitudinal differences in ozone trends are due to a combination of the transport of ozone depleted air from the polar vortex and decadal variations in the circulation.

We apply a multiple linear regression model to the the column ozone from the merged TOMS/SBUV data set including quasi-biennial oscillation, solar cycle, height of the 250 hPa geopotential and finally the ozone depletions. This combination may account for the major part of the longitudinal ozone trend variations as well as a substantial part of the total midlatitude ozone trend in spring.