

Interactive comment on “Dynamics and chemistry of vortex remnants in late Arctic spring 1997 and 2000: Simulations with the Chemical Lagrangian Model of the Stratosphere (CLaMS)” by P. Konopka et al.

Anonymous Referee #1

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This paper presents some very interesting chemical calculations during spring 1997 and 2000. The paper is clear and well written (except for some typos), and I recommend the paper to be published with only minor changes.

MINOR SPECIFIC COMMENTS:

Abstract: In the abstract you may want to add that the influence of mixing on ozone depletion in the vortex remnants is small.

Fig. 2: The diabatic descent does not agree with Match calculations. September is too early to define vortex air for the winter. This figure can safely be omitted. In fact there

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is descent in spring as seen in figure 3

TECHNICAL CORRECTIONS:

The following page and line numbers refer to the submitted document, which was sent to me, and not to the document on the web page.

Page 1, col. 1:

last para, l 3: the 'contrast' between 1997 and 2000 lies in the ozone destruction and not in the dilution, I suppose, so this must be rephrased.

last para, l -2: omit 'by'

Page 1, col. 2:

1. para, l 4: suggest 'downward' instead of decline

2. para, l 5: omit 'the'

2. para, last sentence: The results of Chipperfield and Jones are greatly influenced by model errors. Andersen and Knudsen (GRL, 2002) found that the ozone depletion dominates the interannual variability north of 63N.

3. para, l -4: suggest to add the year of the Piani calculations

Page 2, col. 2, l -9: Is the quoted mixing for north or south of 30N? The super and subscripts of D should be explained or omitted.

Page 3, col. 1:

l -7 - -5: how can a temperature history be used for HNO₃ determination?

l 8: write: in the vortex, or, if the vortex

Page 4, col. 1:

fig 3: x-axis text: suggest: CH₄(HALOE)

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l -7: 'breakup' must be in two words here (not elsewhere)

l -6 - -5: use 'middle of May' or 'mid May'

Page 4, col. 2, 2. para, l 9: neighbouring

Page 5, col. 1, 1. para, last sentence: you might add that the weak mixing is in agreement with Haynes and Shuckburg (JGR, 2000)

Page 6:

fig. 5, l 2 in caption: 'percentage of' instead of 'rate the'

col. 1, l 6: use 'polar' instead of 'Arctic'

col. 2, l -9: rephrase sentence to eg.: As can be seen in Figure 9, it is not until the end of April that

Page 7:

fig 7 caption: suggest to add the year

fig 8: should the HALOE measurements form a circle?

col 2, l -9: use 'faster' instead of 'more'

Page 8, col. 1:

l -8: add 'the' before deactivation

Page 8, col. 2, 3. para:

l 1: suggest 'halogen-induced' before 'mid-lat.'

l -5: add 'the' before 'isentropic'

l -4 - -3: suggest rephrasing to: Thus, the halogen-induced ozone deficit at the end of May 2000 amounts to about 12 %

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I -1: 'to' instead of 'by'

Page 9, col 1:

I 8: omit 'than'

I 13: the difference between the 10 and 40 km is probably due to the weak diffusivity of the Prather scheme

Page 9, col 2, I -5: suggest to omit 'still'

Page 10:

fig 11: suggest to omit the dashed lines or at least define them.

col. 1, I -2: suggest: circulation with very weak mixing

col. 2:

I 2: suggest to add 'below 20 km' after '55N' . remove 'a' before 'coarsely'. suggest 'the weakly mixed' instead of 'coarsely'.

I 9: suggest to omit comma after 'particular'

I -3: suggest to add comma before 'which'

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