

## ***Interactive comment on “Simple measures of ozone depletion in the polar stratosphere” by R. Müller et al.***

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This paper presents an argument for discontinuing the practice of taking the minimum total ozone value encountered poleward of a fixed latitude during March/October as a proxy for chemical ozone destruction, as has been the practice with a number of recent assessments. It is impossible to disagree with this argument if one stops to think for more than a few seconds, and it is remarkable that such an inappropriate measure has been used at all for the Arctic. The authors recommend as an alternative the minimum of the daily average of total ozone poleward of a fixed latitude, and claim that this quantity agrees better with more sophisticated measures which require a wealth of information not available for historical data. However, I did not find a convincing proof that this measure is much better than the daily minimum. This is because the paper

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does not show a direct, simple comparison between the two measures and a more sophisticated one. Figures 10 and 11 compare VPSC with March mean total ozone and March minimum daily mean total ozone, but neither shows a particularly good fit. I would conclude from these figures that none of the simple measures capture chemical ozone loss.

In the context of current international assessments it may be worth publishing such a paper as this, though its scientific value, as the referee points out, is low. To be of value I feel that the argument should be made as concisely and clearly as possible, with strong caveats about the validity of any 'simple' measure of Arctic ozone destruction. Given its limited focus I felt that the argument in this paper sometimes diverges from the point being made, and recommend removing figs 6 (which is incomprehensible anyway) and 7, and the text from lines 290-345. A much shorter paragraph, summarising the results of this section, might be acceptable, but the text as submitted, with the two figures, is hard to follow and distracts from the main argument of the paper.

There is a danger with a paper like this that some people will take the result as an endorsement for using simple measures of ozone destruction, whereas the clear message for me is that they must be used with a great deal of caution and only if more sophisticated measures are not available. The abstract and conclusions should absolutely nail this point.

Despite repeated efforts I have not been able to get a second reviewer for this paper, but I find the comments of the first reviewer to be pertinent and useful. I urge the authors to take these and my comments above fully into consideration when reviewing the paper. At present I am not convinced that this paper should progress to ACP.

Fig.5: state specifically what lines correspond to the different statistical quantities. The figure is difficult to follow

Fig 8a - caption needed

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