

## ***Interactive comment on “First description and classification of the ozone hole over the Arctic in boreal spring 2020” by Martin Dameris et al.***

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### **On the use of the phrase “Arctic ozone hole”**

In this manuscript, the phrase “Arctic ozone hole” is used many times. Even though one reviewer Ingo Wohltmann already pointed out that this is problematic, we would like to come back to this point.

There is no rigorous scientific definition of an “ozone hole”. Commonly, the ozone hole size is used as the area where the total ozone column is below 220 Dobson units (DU). This value was chosen because it is lower than values reached in the Antarctic prior to the appearance in the early 1980s (when chemical ozone destruction via man-

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made compounds was first large enough that it dominated the evolution of ozone in the Antarctic spring) of what is now commonly called the Antarctic ozone hole, and because it does tend to approximately follow the vortex edge in the Antarctic (Newman et al., 2004). It is not at all clear, given very different conditions and background ozone levels, that these considerations would be appropriate for the Arctic.

It is true that for the first time, Arctic ozone columns were depleted to below 220 DU. In the manuscript, an “ozone hole area” of 0.9 Mio km<sup>2</sup> is reported. This is well below the Antarctic ozone hole areas of 20-30 Mio km<sup>2</sup>. Ingo Wohltmann has nicely summarized the arguments that do not need to be repeated here.

A specific meaningless concept is the “daily accumulated ozone hole area”. If we did get this correctly, it would be the sum of daily “ozone hole areas”. If this concept was used for the Antarctic ozone hole, it would reveal an area of about 3 times the total surface of the earth.

Beyond the scientific arguments, there is also the responsibility of science not to transport sensation but to convey correct understandable information to the general public. Many people without scientific background in this area would see only the phrase and draw the wrong conclusion that in the conditions in the Northern hemisphere are comparable to those in the Antarctic ozone hole. We have seen that in press articles already. We therefore request that the authors reconsider their choice to call the severe Arctic ozone depletion in 2020 an “Arctic ozone hole” and revise the paper accordingly.

**Jens-Uwe Grooß and Gloria Manney**

### Reference

Newman, P. A., Kawa, S. R., and Nash, E. R.: On the size of the Antarctic ozone hole, *Geophys. Res. Lett.*, 31, L21104, 10.1029/2004GL020596, 2004.

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