

Interactive comment on “Unusually low ozone, HCl, and HNO₃ column measurements at Eureka, Canada during winter/spring 2011” by R. Lindenmaier et al.

Anonymous Referee #2

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General comments: The authors show the unusually low ozone, HCl and HNO₃ observed at Eureka, Canada during winter/spring 2011. For their evaluation, they use the data from FTIR instrument, Rayleigh/Mie/Raman lidar and PTU radiosondes. The results from last winter are compared to the large dataset recorded at the station during previous winter/spring since 1997 and to remove the dynamical processes in the evolution of the various compounds a normalization with HF has been used. In order to assess the ozone chemical processing, the passive subtraction method has been used with passive ozone from SLIMCAT chemical transport model.

The paper is well structured, clear and is addressing scientific questions within the

C265

scope of ACP. I recommend publication after minor revisions.

Specific comments:

Chapter 3 Vortex edge: As already mentioned by Referee #1, why the author do not use Nash criteria for vortex edge? How does this compare with Q diagnostics? I do not think that it is correct to use a fixed proxy for the inner and outer edge of the vortex throughout the winter/spring period. The value of the vortex edge should also change from one year to the other depending on the strength of the vortex. Can you comment?

Chapter 4 Ozone columns are usually measured in Dobson Unit. It is difficult for the reader to have ozone columns in mol/cm². On figure 5, both units are indicated. On figure 7, I understand that it is difficult to add a second axis with DU but on figure 8, the right axis should be Dobson Unit and not temperature.

Figure 7: I am surprised by the remarkable good agreement between 125 HR ozone and SLIMCAT ozone at the beginning of the period. Usually, due to the coarse vertical resolution in the SLIMCAT model for altitudes below the 350-K potential temperature level [Feng et al., 2007] a normalisation of SLIMCAT passive and active ozone is necessary, this normalisation can be sometimes as large as 100 DU. Please provide additional information.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 1053, 2012.

C266