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Atmospheric Chemistry and Physics Discussions

Interactive comment on "HO_2NO_2 and HNO_3 in the coastal Antarctic winter night: a "lab-in-the-field" experiment" *by* A. E. Jones et al.

Anonymous Referee #3

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Jones et al. presented a very rare but valuable dataset of HNO3 and HO2NO2 observed in the Antarctica. More importantly, the authors cleverly interpreted data to validate the existing thermodynamic parameters of dry deposition to the ice surface for the given chemical species in the real world conditions. The analysis indicate excellent agreements with previous laboratory experimental results. I recommend the publication of this manuscript with minor modifications suggested below.

1. Introduction: Please provide specific information about typical lifetime of HO2NO2 and HNO3 from specific reaction channels (R2a to R5). Some of those listed reactions may or may be not important in the tropospheric conditions especially conditions like Antarctica. Please discuss further about the implications of each reaction channel specifically in the lower troposphere!

2. Page 12775 Line 15: This section is describing CIMS instrumentation so the title would be better for going by either "CIMS instrumentation" or "CIMS".

3. Page 12783 Line 15-20: Once HNO3 and HO2NO2 molecules are adsorbed in the ice surface, how long would it be stayed as it is? I would think that it will be dissolved into the ion phase then nitrate and nitrite in ice would be regenerated into the gas phase species as described in Domine and Shepson (2002 Science 297 pp 1506). Please add a detailed discussion on the specific relevant heterogeneous mechanisms.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 12771, 2014.