

Interactive comment on “Low levels of nitryl chloride: Nocturnal nitrogen oxides in the Lower Fraser Valley of British Columbia” by Hans D. Osthoff et al.

Anonymous Referee #2

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This manuscript reports measurements of ClNO_2 , N_2O_5 and other chemicals (ozone, NO_x , NO_y , aerosol size and composition and VOCs etc) at a surface site near the Lower Fraser Valley during a two-week period in summer 2012. The study was motivated by the need to investigate the role of ClNO_2 in ozone exceedance in the region. However, the relatively short field study did not capture any high ozone events, and low ClNO_2 levels were observed due to fresh emissions of NO which suppress the production of N_2O_5 and ClNO_2 at night. The paper investigated some metrics related to production and loss of $\text{N}_2\text{O}_5/\text{ClNO}_2$ with the aid of a simple box model, and the results show small contribution of ClNO_2 to radical production in such an environment, as one would expect. While the data on ClNO_2 and N_2O_5 add to the global data base of the

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two important and poorly documented species, the main finding (low N₂O₅/ClNO₂ in high NO condition and resulting small contribution of photolysis of ClNO₂ to radical source) gives limited new insight on the processes and impact of N₂O₅ and ClNO₂, as such the significance of this work is unclear.

Specific questions on methods: What was the extent of N₂O₅ loss in the sampling line during the field study? For NO_y measurements, was the Mo converter placed at the sample inlet outside? Was a filter placed before the Mo converter? The aerosol size measurements only covered size 10 nm to 487 nm, were the larger size particles considered when calculating the aerosol surface area density? What was the uncertainty of the simple box model adopted?

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