Atmospheric Chemistry and Physics Discussions

Interactive
Comment

Interactive comment on "Factors controlling Arctic denitrification in cold winters of the 1990s" *by* G. W. Mann et al.

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This paper would be improved by adding a discussion about how the denitrification as observed compares to the simulations in the years other than 1999/2000. For example, the Waibel paper (Science 1999) shows significant denitrification from a balloon profile in Feb 1995. If no observations are available or used, judgement of the value of the conclusions remains in limbo until such a comparison can be made for another variable set of winters. For example, if the model simulations compare poorly to the intensity of observed denitrification, then perhaps it is the variation in nucleation rate with metereological factors etc that controls the intensity instead of closed flow area.

A helpful addition to the paper would be comments or analysis concerning how the simulated denitrification amounts would scale with the assumed constant value of the

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nucleation rate. This may help the study 'age well' if we learn/deduce in the future that the effective rate is not constant or has a different value.

The Northway et al. flux paper (GRL 2002b) is in the reference list but does not seem to be cited. One point of comparison with the simulations that it affords is with the instantaneous flux values in 1999/2000 and limits in these values.

It is perhaps worth adding the caveat that the composition phase of the particles observed in 1999/2000 is inferred to be NAT rather than measured.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 2557, 2002.

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