Biogeosciences Discuss., 9, C6112–C6113, 2012
www.biogeosciences-discuss.net/9/C6112/2012/

Biogeosciences Discussions

Interactive comment on "Seasonal measurements of total OH reactivity fluxes, total ozone loss rates and missing emissions from Norway spruce in 2011" *by* A.C. Nölscher et al.

Anonymous Referee #4

Received and published: 30 November 2012

The authors present OH reactivity and ozone loss rate observations from a leaf cuvette set-up for Norway spruce trees. Considering insufficient understanding of reactive BVOC emissions, the research results could be very interesting and appreciated by the community. However, I found that the descriptions of experimental set-ups and concepts of observations are very confusing that can lead to conclusions that the data analysis is fundamentally flawed. I would recommend that the authors should resubmit this paper after address following points.

1) My understanding after reading the current form of manuscript is that there was ozone in the air flowing in the cuvette system for ozone loss quantifications. If that

is the case, chemical transformation of BVOCs is expected. This is especially true for monoterpene and sesquiterpene species which have high ozone reactivity. This also means that the air coming out from the cuvette might contain significant oxidation products from terpenoid-ozone reactions. If this is the case, the whole arguments based on the assumption that observed missing OH reactivity is coming from primary emissions are not relevant anymore.

2) As the authors described, the observed ozone losses are expected from not only chemical losses but also wall and stomatal uptakes. The authors admit that they could not separate ozone loss rates from each process but still discussed about the data in the context of chemical ozone losses from unknown chemicals without any justification. The authors should either withdraw the presentation and discussion of the ozone loss observation dataset or throughly discuss for the justification of physical meaning of the dataset.

3) By definition, OH reactivity is reciprocal of lifetime of OH with the unit of time and flux is "the rate of low of a property per unit area". I understand that the authors try to develop a term that represents reactivity of BVOC emissions but I would argue that the new term that the authors developed actually is very confusing and may be physically incorrect. The authors could simply describe that the amount of missing BVOC emission is equivalent of x times of alpha-pinene emissions. This way, readers would not need to consume time to learn about the confusing new term.

Interactive comment on Biogeosciences Discuss., 9, 13497, 2012.