Atmos. Chem. Phys. Discuss., 15, C7397–C7398, 2015
www.atmos-chem-phys-discuss.net/15/C7397/2015/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Carbonyl sulfide exchange in soils for better estimates of ecosystem carbon uptake" *by* M. E. Whelan et al.

Anonymous Referee #2

Received and published: 30 September 2015

Review of Whelan et al

The goal of this paper is quantify and understand the soil flux of carbonyl sulfide (COS) so that COS can be used more confidently as a proxy for gross primary productivity (GPP). This paper represents a significant contribution to our understanding of soil fluxes but also presents the uncertainties and suggests future work.

General comments: Could the prior history of the soils lead to some of the variability seen in this study?

Technical details: Pg 21097, line 16: ppt is mole fraction not concentration

Pg 21100, line 16: This is confusing. Was a constant concentration of COS and CO2

used for these studies? If lab air was used, what was the variability in the ambient mixing ratio. And if the CO2 mixing ratios changed to the point of the flux not being useful, how believable were the COS fluxes for the same periods?

Pg 21100, line 24: How large was this correction?

Pg 21101, line 16: Awkward phrasing.

Pg 21103, line 8: Should litter fluxes included in the ecosystem flux?

Pg 21103, line 14: What does this mean? GPP greater than 25 umol m-2 s-1? And what is the uncertainty in GPP?

Pg 21103, line 23: concept not conceit I assume?

Pg 21104, line 1: Is there enough previous literature to justify using equation (1) in this way?

Pg 21104, line 8: Not zero but much less than the leaf uptake

Pg 21104, line 23: does increased mean more positive?

Pg 21106, line 13: Was were the range of H2O mixing ratios? Could this cause a problem with the spectral COS fit? Could the COS increased flux be an artefact of the nafion? Was the nafion tested for COS hysteresis with stable signals with both increasing and decreasing H2O?

Pg 21107, line 22: Why not use sites where COS has been measured? I know of flux measurements of COS at Harvard Forest and in Finland. There may be more. Section 4.2: Really well written!

Pg 21114, line 11: agricultural soils?

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 21095, 2015.