Atmos. Chem. Phys. Discuss., 15, C9622–C9625, 2015
www.atmos-chem-phys-discuss.net/15/C9622/2015/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Canopy-scale flux measurements and bottom-up emission estimates of volatile organic compounds from a mixed oak and hornbeam forest in northern Italy" *by* W. J. F. Acton et al.

Anonymous Referee #1

Received and published: 20 November 2015

This paper describes a thorough analysis of BVOC (mainly terpeniod) fluxes made by PTR-MS and PTR-ToF-MS in an Italian forest.

General comments

The explanation for isoprene flux discrepancies using tree species distribution needs a little clarity. The argument gets lost in supposition (see line 22-23 in the abstract). In addition, Line 26 on page 29237 sounds like an explanation, but then the authors disagree with their own argument in the very next line. Clarify this transition of information

by re-wording or re-framing the argument.

Specific comments

Page 29216, Lines 9-10: this statement is very vague

Page 29218, Line 20: in reference to line 25, was the tubing inside the PTR-MS heated as well, or just the inlet? Was there any concern about BVOC loss/condensation when transitioning between the silcosteel inlet and the internal PTFE tubing?

Page 29221, section 2.2.2: Was an error estimation done for the calibration (like what is mentioned in section 2.2.1 for the PTR-MS)?

Page 29226, Line 9: how does using the 400 ppm CO2 concentration affect the "bottom-up" estimate, if at all? What was the ambient CO2 mixing ratio for the campaign?

Page 29227, Lines 1-6: "commercially available reference standards were used to create calibration curves and to quantify the emissions" (lines 1-2) and "using authentic gaseous standards. . . or liquid standards (line 5) => are these two sentences referring to the same standards? If so, there is no need to repeat the information; simplify. This calibration process mentions quantifying the total BVOC emission; why not calibrate each compound since BVOC separation is made on a GCMS? Were standards injected onto the GCMS as liquids to create calibration curves, or were these liquid standards used to make gaseous standards that were subsequently sampled by the silcosteel cartridges? These two methodologies would give very different results.

Page 29231, Line 24-25: why isn't acetone influenced by the planetary boundary layer and mixing like the other BVOCs?

Page 29234, Lines 7-9: There is repetitious information; the R2 value is reported twice. The entire sentence is confusing; which value corresponds with PAR, with H?

Page 29235, Line 6: how was the production factor calculated?

Page 29236, Lines 11-12: “which simulate de novo emission” – to emphasis the point, consider adding “only” before “simulate”

Page 29238, Line 5: similar emphasis needed; add “only” after “LIDAR data”; Line 14: Why are the emission factors compared to Karl et al.?; Line 17: “the speciated monoterpene flux” from this study or from Karl et al.?

Page 29239, Lines 3-6: explain what was done to optimize the emission factors

Technical comments

Page 29216, Line 5: add a comma after “BVOCs”; Line 8: add a comma after “BVOC”; Line 19: omit “upon”; Lines 22-24: this sentence has too much information (run-on)

Page 29219, Line 12: “pauses for optimization and refill” – there is an incorrect verb/object agreement; Lines 27-29: Simply these two sentences (or omit the first one) because much of the information is repeated.

Page 29222, Line 19: insert “were” after “files”

Page 29223, Line 3: “previously been successfully” – too wordy

Page 29225, Line 2: omit “applied”

Page 29226, Lines 12-13: suggested wording change: “used to sample BVOCs. . . by adsorbing them on to a silco-steel. . .”

Page 29233, Lines 11-14: very awkward wording; Line 17: omit “a”

Page 29234, Line 15: add a comma after “expected”; Line 17: add a comma after “conditions”; Lines 16-20: this sentence is long and confusing (run-on)

Page 29235, Line 7: repetitious information “canopy emission factor”; Lines 10-11: “canopy was modeled using the canopy model” is too wordy; Lines 11-12: run-on sentence; Lines 14-18: wordy and confusing; Line 15: add a comma after “factors”

Page 29236, Line 3: add a comma after “emission”; Line 6: omit “that”; Line 7: change

“takes the form of” to “is”; Lines 22-23: awkward phrasing; Line 25: add a comma after “available”; Lines 26-28: run-on sentence and very wordy

Page 29237, Line 5: change “incorporating” to “incorporated”

Page 29238, Line 8: change “detecting” to “to detect”; Line 20: omit “to be caused”

Page 29239, Lines 6-8: Change to: “isoprene and monoterpene emission factors gave good correlations with measured fluxes (R2 values of 0.75 and 0.76, respectively).”

Page 29240, Lines 1-2: Simplify this wordy statement

Tables 1 and 6; Fig 10: split the caption into multiple sentences.

Table 5: for speciated monoterpene data, indicate the instrument (i.e. sum = total speciated compounds vs. m/z 137 on PTR-MS)

Figure 1: vertical lines would help the reader see the time relationship of the data

Figure 3: “diurnal volume” is awkward phrasing

Figure 4: delete “the method of”; the placing of “respectively” is awkward

Check the grammar when you write that a tree emits monoterpenes: is it “monoterpene emitting” or “monoterpene-emitting”. “Volume mixing ratio” sounds awkward, use “mixing ratio by volume” “mixing ratio (ppbv)”

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 29213, 2015.