

Interactive comment on “Effect of mid-term drought on *Quercus pubescens* BVOC emissions seasonality and their dependence to light and/or temperature” by Amélie Saunier et al.

Anonymous Referee #2

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This manuscript presents BVOC emission data from the drought tolerant *Quercus pubescens* using PTR-TOF-MS techniques. The authors study a suite of BVOCs (isoprene, methanol, acetone, acetaldehyde, formaldehyde and MACR+MVK+ISOPOOH) at 3 points over a year, under both natural and amplified drought conditions. They compare observations with model algorithms and report 2 types of emission responses: 1) light and temperature dependent and 2) $1/t$ dependent during the day and only temperature dependent at night.

General Comments English grammar problems are numerous throughout the manuscript.

Your two types of responses can be more easily summarized throughout the

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manuscript, “All six BVOCs monitored showed daytime light and temperature dependencies, while three BVOCs (methanol, acetone and formaldehyde) showed nighttime temperature dependencies as well.”

Figures 4 and S3 show that the models do accurately simulate the emission burst for methanol as well as the formaldehyde deposition, albeit the models both show a slight lag in the hour of the day in just the autumn natural drought conditions.

Specific comments L13 and throughout manuscript: use plural form “BVOCs” when speaking about more than one compound L19: “. . .especially in the Mediterranean. . .” L22: “. . .a drought tolerant. . .” L51 – 53: You write: “Several models, already existing (Guenther et al. 2006; Guenther et al. 2012; Menut et al. 2014), predict BVOC emissions according to the type of vegetation, biomass density, leaf age, specific emission factor for many vegetal species, as well as the impact of environmental factors.” Please separate references for accuracy. For example, MEAGAN models (Guenther 2006 and 2012 references) do not include vegetation species specific emission factors nor account for leaf age or biomass density.

L70: “. . .IPCC predicts. . .” L85: “60 km North of Marseille, France. . .” L93: You write, “. . .drought (300m²) and an amplified drought (232m²).” Better indicate what the values in parentheses represent.

L93 – 101: This wording was difficult to understand. How did you determine the extent of drought? How do you know this was indeed a drought stress?

L95 – 97: “During the first year of experiments (2012), 35 % of natural rain was excluded and, afterward, 33.5 and 35.5 % were excluded (2013 and 2014, respectively) corresponding for three years, to 2 months for natural treatment and 5 months for amplified treatment of drought period.” This text should be rewritten to clearly describe the differences between the natural and amplified drought treatments in terms of rainfall exclusion and periods of application, i.e. what 2 month period? What 5 month period? Was there any sampling conducted prior to the experiment or during the experiment on

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non-drought stressed trees for comparison?

L229 - 231: Nevertheless, our results suggested that methanol emissions responded strongly to light and temperature during the day whereas, during the night, they responded to temperature. See General Comments for suggested clarification.

L261 – 262: “Moreover, some phenomenon, such as the burst in early morning (methanol and acetaldehyde) or the deposition/uptake (formaldehyde), were not modelled by L+T or T algorithm.” Figures 4 and S3 show that the models do accurately simulate the emission burst for methanol as well as the formaldehyde deposition, albeit the models both show a slight lag in the hour of the day in just the autumn natural drought conditions

[Interactive comment on Atmos. Chem. Phys. Discuss.](#), doi:10.5194/acp-2016-836, 2016.

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