

Thanks for your answer.

#### Scientific comments:

**Page 6, lines 196-197:** “The emissions of all BVOCs followed during this experimentation were reduced under amplified drought compared to natural drought, especially in spring and summer (Table 1) except for acetaldehyde emissions”. Was this statistically significant? Can you give p-values e.g. in Table 1.

*We added p-value in table 1.*

**Page 7, line 223:** “...a slight underestimation of emissions ( $sl = 0.84$ ,  $P < 0.05$ )...” how can the algorithm, if fitted seasonally to the data, underestimate the emission? If I understand correctly the EF to calculate the emission was obtained by fitting the algorithm to the exactly same dataset. If I misunderstood, others may also and thus this needs to be written more clearly. Also, is the p-value for the correlation or have you tested the deviation from 1:1 line? You should have the latter to be not misleading the readers. These two questions concern also at least the following claims:

-Page 7, line 231: “...a slight underestimation was observed ( $sl = 0.87$ ,  $P < 0.05$ )”.

-Page 7, lines 236-237: “...underestimations were observed in spring and summer ( $sl = 0.72$ , and  $sl = 0.57$ ,  $P < 0.05$ , respectively)”

-Page 7, line 238: “...underestimation was only observed in summer ( $sl = 0.80$ ,  $P < 0.05$ )”.

-Page 8, lines 263-264: “...slight underestimations were observed ( $sl = 0.88$ ,  $P < 0.05$  and  $sl = 0.69$ ,  $P < 0.05$ , respectively)”.

-Page 8, line 265: “...line overestimation of modelled emissions ( $sl = 1.27$ ,  $P < 0.05$ )”.

*Indeed, EF was determined with the same dataset as used to modelled emissions. EF was the slope of the correlation between emission rates and  $Cl \cdot Ct$  for L+T algorithm and the correlation between emission rate and  $Ct$  for T algorithm (line 172-176).*

*In our study, temperature, light, season and the water stress were factors taken into account to modeled BVOCs emissions. An under (or –over) estimation between measured and calculated emission rates highlights the fact that the driving parameters considered in the algorithm (temperature, light, season, drought) did not allow to explain 100% of emissions. Thus, it seems that other factors which are not taken into account in our study influenced emissions*

*We tested the deviation of the slope from 1:1 line and the p-value presented for each example cited above was the p-value of this slope comparison test. We detailed more this test in material and methods (line 184-186) as well as in the manuscript.*

#### Technical comments:

**In many locations:** “BVOCs emissions” should be “BVOC emissions”

*We checked the BVOCs or BVOC throughout the manuscript.*

**Page 2, lines 68-70:** “These studies reveal that there are still some misunderstandings at the level of emission mechanisms since some works showed increases (Funk et al. 2004; Monson et al. 2007) or decreases of isoprene emissions (Brüggemann & Schnitzler 2002;

**Fortunati et al. 2008)”. Would this indicate rather lack of understanding rather than misunderstanding?**

*We changed that in the manuscript (line 68).*

**Page 3, lines 71-72: “Moreover, the sensitivity of isoprene and highly volatile BVOCs emissions to recurrent water stress (few years) under in situ conditions is clearly missing”. Is it sensitivity or rather understanding of the sensitivity that is missing?**

*It is the understanding of sensitivity that is clearly missing. We changed that in the manuscript (line 71).*

**Page 4, line 116: “air generator”. Is this zero air generator?**

*No, it is not a zero air generator. It is a pump made inside by PTFE. We changed “air generator” into “pump” to avoid confusion (line 116).*

**Page 4, line 132: “Exchanges of CO<sub>2</sub> and H<sub>2</sub>O from the enclosed branches were...” should be “Exchange of CO<sub>2</sub> and H<sub>2</sub>O from the enclosed branches was...”**

*Yes indeed, we changed that in the manuscript (line 132).*

**Page 4, line 144: “catalyzer”. What is catalyzer? It has not been described before. Is it air generator mentioned in line 116?**

*No, it is not the same thing. The catalyst consists in a 25 cm long stainless steel tubing, filled with platinum wool and heated at 350°C to efficiently remove VOCs from sample and measure potential instrumental background levels. This has been specified in the manuscript (lines 144-146).*

**Pages 4-5, lines 144-145: “Each sample was analysed every hour, with 15min of analysis”. How can this be as there are five samples according to the previous sentence.**

*BVOCs emissions were sampled concomitantly for one tree under natural and amplified drought, during 1 or 2 days (line 115). During the sampling day, there was a measure cycle thanks to the valve system (Vici) which allows us to measure BVOC emissions from each sample line (amplified drought – inlet air – natural drought – ambient air – catalyzer) every hour during 15min. However, we followed 5 trees for each plot (natural and amplified drought) by moving enclosures chambers from trees to trees during two weeks.*

**Page 5, line 148: “A calibration gas standard” Which compounds were in gas standard?**

*It is a mixture of 14 aromatic organic compounds (100 ppb each in nitrogen). It includes benzene, toluene, styrene, m, o, p-xylene, ethylbenzene, 1,2,4 trimethylbenzene 1,3,5 trimethylbenzene, chlorobenzene, 1,2 dichlorobenzene, 1,3 dichlorobenzene, 1,4 dichlorobenzene, and 1,2,4 trichlorobenzene. We added this in the manuscript (line 150-151).*

**Page 5, Equation (1) expresses gas exchange per foliar mass. However, on page 4, lines 138-139 you state “Gas exchange were hence expressed in a leaf surface basis”, leading to inconsistency.**

*Gas exchange in terms of CO<sub>2</sub> and H<sub>2</sub>O was expressed in a leaf surface basis whereas BVOCs emissions were expressed per foliar mass. To avoid misunderstanding, we wrote “P<sub>n</sub> and G<sub>w</sub> were hence, expressed in a leaf surface basis” instead of “Gas exchange were hence expressed in a leaf surface basis” (line 138).*

**Page 6, lines 212-213: “All six BVOCs monitored showed daytime light and temperature dependencies (isoprene, degradation products of isoprene and acetaldehyde),...” The beginning of this sentence is confusing as it mentions six BVOCs but then only gives three in parentheses.**

*We changed that in the manuscript (line 293-294).*

**Page 7, lines 247-248: “However, some observed phenomena suggested that methanol emissions was sustained by temperature alone at certain moment of the day”. This sentence is a bit confusing and vague. Could it better as “However, some observed phenomena suggested that methanol emission was sustained by temperature alone in the absence of light”.**

*Yes indeed, we changed this sentence (line 249-250).*

**Table 1: Too many significant numbers in part of the values. E.g.  $107.7 \pm 18.6$  should be expressed as  $110 \pm 20$  (as the two last digits in the original form contain no information).**

*We changed that in table 1.*