Reply to Referee #2 comments

General comments

As for the referee #1, the different general improvement suggested were made and detailed here after in our reply to the specific comments. In particular we made clearer in the revised manuscript when PTR-MS and when cartridges were employed in our measurements ('sections 2.2' and '2.3'). The structure was slightly changed, as suggested, with a re-organised section '3.2' new section '3.4'.

Specific comments

P1722L27: This change was made as suggested

P1722L28: This change was made as suggested

P17232L10: Referee #2 was right, a punctuation mark was added as suggested between 'biomass' and 'LMA'.

P17232L23: The laboratories IMBE and LSCE are already defined in the author list; they were not defined again here to prevent any tediousness. But as recommended, we have explained why this partnership was created, essentially due to the number of samples (section 2.3).

P17232L26: As recommended we have change by 'close'.

P17233L18: As recommended we have change by 'chromatograph'.

P17234L4: The isoprene limit of detection expressed in µgC g_{DM}^{-1} h^{-1} is the same for all samples taken from all branches (sunlit or shaded) during this study, since similar sampling and analytical methods were used for all our samples. However, because LMA was found to be different for sunlit and shaded branches respectively, we decided, in the initial manuscript, to express this value in µgC m^{-2} h^{-1} too: one for the sunlit branch and one for the shaded branch. In order to prevent any further confusion the isoprene limit of detection is now expressed in the new manuscript *only* in µgC g_{DM}^{-1} h^{-1}. Sunlit and shaded LMA values being explicitly given in section 2.3, readers can, if needed, easily convert the µgC g_{DM}^{-1} h^{-1} into µgC m^{-2} h^{-1}.

P17236: as recommended, section 3.2 was re-organised. It is now divided into 2 sections, 'section 3.2.1' and '3.2.2' dedicated to *Q. pubescens* and *A. monspessulanum* species respectively.

Q.pubescens BVOC emissions are now structured into different paragraphs. After general discussion, BVOC emissions are now presented according to their relative contribution (MeOH, total MT, Acetone, and MVK+MACR+aldehyde) into 4 different paragraphs.

BVOC observations made on *Acer* are also better structured (general findings are now pooled together and presented at the beginning, and a different paragraph was made for every new 'idea' (fraction of assimilated C, light and T influence …).
We do hope this improves the reading and understanding of this former section 3.2

P17237L1-2: We apologize, but the correlation mentioned between acetaldehyde and methanol was a mistake from a former copy/paste version of the manuscript, and is now deleted.

P17238L16: P17237L16 is not correct it should be: "P17238L16". It was indeed a mistake: the remaining fraction of BVOC was lower in the morning than in the afternoon as it is now stated in the revised version.

P17239L1-8: We agree with this point and we have added a comment and the Niinemets and Reichstein (2003) reference.

P17239L7: We have changed this point as mentioned.

P17239L8: Clarification was made end of section 3.3 according to referee comment.

P17239: Indeed, the former Table 3 presents a large number of parameters, obtained at different dates, on different time scales, for different trees. After many tries, we ended up by selecting the 'Table' format to present them all, rather than numerous different figures which did not make easier to follow the 'actual story'. We thus preferred to keep the Table 3 as it was presented in the initial version, without any additional figure. Note that former Table 3 is now Table 2 in the revised version.

P17240L14-16: This change was made as mentioned

P17240L24 and onward: as suggested, sections 3.3., 3.4 and 3.5 belong now to a same new section 3.4 entitled: "Capturing *Q. pubescens* isoprene emission variability and providing estimates ". Former sections 3.3, 3.4 and 3.5 are now sections 3.4.1, 3.4.2 and 3.4.3 respectively.

P17242L12: Referee 1 also pointed out this point. We do hope that the changes made clarify the last sentences.

P17243: As mentioned previously, the relative C_L and C_T parameters are no longer used and conclusions on that point were changed. In addition, light – or PAR – and temperature are employed in the revised manuscript rather than the, somehow ambiguous, C_L and C_T terms.

P17244 section 3.5: We apologize, but, unfortunately, we are not sure we have understood correctly the reviewer comment: indeed, our *Is* factors were already the best agreement between G93 and measured ERiso since it is the best fit curve of measured ERiso *vs* $C_L \times C_T$.

P17245L9-12: We agree with the referee #2. Consequently we added some further discussion which also replies to referee #1 comment concerning this section (RMSE is now considered for G93 and MEGAN performance comparison, and all comparison results are gathered in the new Table 3.

P17245L14-28: The depth of our water probe was the same as described in the Pegoraro et al., 2004 study (10 cm). This study was used to develop the drought parameterisation in MEGAN. Concerning the drought impact, we agreed that our tree were not hydrically in such bad shape, as mentioned in beginning section 3.3. Moreover, we had already a comment on the weakness of MEGAN in the previous version of the manuscript concerning the drought parameterisation in our conclusion and in the last section but one.

P172247L11: Changes requested were made.

P172247L13-14: Indeed, PAR and T referred to C_L and C_L respectively, but we have changed by light and temperature effect as mentioned for previous comments. The relative role of C_L and C_T is now no longer considered as suggested in previous comments.

P172247L20-22: this section was moved to appropriate discussion section.

(former) Figure 3: *T* and PAR were not included in the former figure 3 as it made it too difficult to read; instead we have added a figure 3b. Former Figure 3 became then Figure 3a.

(former) Figure 4: As suggested by referee #1 as well, C_L and C_T relative contribution has been removed and only C_L and C_T are now presented and discussed in the revised manuscript. Concerning branches other than *Qp*4; since samples were manually collected using cartridges, we had not enough frequent data to produce a useful and accurate figure as for Qp4.

(former) Figure 6: As also suggested by referee #1, *T* and PAR were added in the revised manuscript.