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## ***Interactive comment on “Concentrations and fluxes of biogenic volatile organic compounds above a Mediterranean macchia ecosystem in Western Italy” by B. Davison et al.***

**Anonymous Referee #2**

Received and published: 9 April 2009

### General Comments

This is an interesting and potentially useful paper, describing field measurements of biogenic VOCs in a Mediterranean landscape, some ten years after a large collaborative intensive effort in the BEMA project. As the authors point out, while the BEMA project produced a great deal of similar data, technology has advanced, and it was timely to use the newer PTR-MS which gives highly time-resolved measurements of BVOCs which were previously impossible. The authors need to emphasise the novelty of their measurements more in the conclusions. The authors have explained the methodology in meticulous detail, but the methods still need further evaluation in a few

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instances (details below). The methods section is already very long, so I am wondering if some of the material could be referenced to already-published work.

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The MS describes two periods of measurements of concentrations and flux of BVOCs at Castelporziano, Rome. It reports carefully executed work, with critical examination of the time series of concentrations and fluxes. It is a pity that there was no attempt at correlation of concentrations and/or fluxes with light and temperature, or with the other meteorological parameters (which are presented in the first figure), no attempt to re-parameterise emissions to improve on efforts from the BEMA project, and no explanation why not. Perhaps this was explored, with no clear results, and if this is the case, it would be interesting and useful to know about, in a sentence or two.

After describing leaf-scale measurements in the methods, no screening results are presented. Are these data to be published separately? It would be nice to know the range of emission rates, and the speciation of compounds found in the emissions from the vegetation screened.

#### Specific comments

In the abstract, reference is made to results -depending on instrument-. I find this does not give the reader confidence in the data that are subsequently presented. I would remove this particular phrase from the abstract, because the measurements appear to be careful.

The reference to Owen and Hewitt (2000) on page 2185 line 9 is not appropriate here, because emission results from European Mediterranean vegetation were actually used in that study. It could be moved to line 18 with the other BEMA references or omitted.

Page 2187, lines 10-13, please let us know where the vegetation information came from 8211; we need a reference.

Page 2187, line 29, did you estimate line loss for the different VOC compounds? Did you find condensation in the lines at all? If not, how was it avoided?

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Page 2188-2189, different sampling regimes were used for the two different measuring campaigns. Can you comment, explain or justify that?

Page 2190, please include a sentence to indicate how far the instruments normalised sensitivities changed between the calibration sessions. If there was any significant change, how was this accounted for in the calculations?

Page 2191 lines 12-15, please explain briefly why the two different water cluster ions were used for concentration and flux calculations.

Page 2195 line 27 (and figure 2), In fact, the difference between Lancaster and CEH results for acetaldehyde is fairly large. Can you comment or explain?

Page 2198 line 2, you could reference Street et al 1997 for the light-dependent emissions from Quercus ilex.

Page 2200-2201, can you discuss, explain or comment on the discrepancy between the modelled and measured data?

Table 1, why were different ions monitored in each campaign?

Page 2202, In the conclusions, can you make clear what is significantly new since the BEMA work? How are these new data making a difference?

Technical corrections

Page 2196 lines 19-24, the sentence -Measurements over crop fields have also shown<sup>8230</sup>- seems to be in the wrong place here. Maybe it would be better following the opening phrase -Methanol was the most abundant compound measured.-

Page 2198 lines 13-24 describe emissions, which seems illogical in the section on mixing ratios.

Table 1, The headings seem to be misaligned as displayed and printed from my computer

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Figure 2, Amend the Figure title, -black diamonds- should be -open circles- now.

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Interactive comment on Biogeosciences Discuss., 6, 2183, 2009.

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