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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Deployment of a ground-based CIMS apparatus for the detection of organic gases in the boreal forest during the QUEST campaign" *by* K. Sellegri et al.

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This manuscript presents some interesting results on VOCs measured above a boreal coniferous forest. The authors have dedicated considerable effort on compound assignment using the present CIMS technique. It appears that the ability to quantitatively measure a wide range of VOCs without calibration standards seems to be challenged by cluster and switching reactions. In this connection some questions on ion assignments arise. The present work (see figure 6 (b)) seems to imply that isoprene is emitted during night. Figure 6 (b) shows a diurnal plot of ions assigned to 'isoprene'. Since isoprene emissions are primarily light dependent, the diurnal cycle with maximum concentrations at night seems to be counterintuitive. Typically one

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would expect much lower isoprene concentrations at night. Can the authors really exclude interference from methanol-water clustering? It seems that high concentrations at night are not caused by isoprene, but may be a combination of increased humidity superimposed on the diurnal methanol cycle with peak concentrations at night. Also, since MVK+MAC are primarily derived from the oxidation of isoprene via HO, these carbonyls typically reach minimum mixing ratios at night. It is interesting that the diurnal plot of MVK+MAC in Figure 6 (b) shows the opposite. The authors suggest direct emission of these carbonyls. However so far MVK emissions from plants have been reported to be rather small (e.g. ECHO) and primarily occur during daytime via stomatal control. The presence of cis-3- hexenyl acetate, which is typically released after wounding, is intriguing. One would expect the presence of other wound VOCs, such as hexenals and hexenols (amu 98, 100). Have ions corresponding to these or similar compounds been observed? This would be interesting since GC techniques that rely on storing samples in cartridges or canisters are challenged by the ability to recover many oxygenated VOCs. Also, the authors claim that the abundance on m/z 69+ observed during LBA-CLAIRE (Warneke et al. 2001) was due to a combination of isoprene + MBO. However to our knowledge nobody has found tropical plants that emit MBO. To date the only plant species reported to emit MBO were only found in North America. Since interference from hydration reactions are greatly suppressed using a PTR-MS instrument, correlation between m/z 69 to m/z 87 should have revealed any significant presence of MBO during LBA-Claire.

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Interactive Comment

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