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Interactive comment on "Mirror image hydrocarbons from Tropical and Boreal forests" *by* J. Williams et al.

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This manuscript by Williams et al. highlights the potential importance of characterizing monoterpene enantiomers and describes some interesting results that suggest that there are differences between tropical and boreal forest species and that the difference is related to the production mechanisms (light dependent vs light independent). This manuscript will be of interest to readers of ACP and should be published after the authors respond to the following comments:

I agree with the conclusion that emission measurement studies of monoterpene enantiomers are needed but it should also be noted that there is a general need for accurate and quantitative measurements of speciated monoterpene emissions and ambient concentrations. There are few measurements currently available, especially for tropical

landscapes, and there are large uncertainties associated with existing data. It is very difficult to determine the accuracy of monoterpene measurements reported in the literature but the analytical challenges of low concentration monoterpene measurements and the experience of intercomparisons for hydrocarbons that are considerably easier to measure (e.g. NOMHICE: Apel et al. 1994, 1999, 2003 JGR) are reasons for concern that past monoterpene measurements may have considerable errors. The additional effort to discern enantiomers will be useful only if the community can rely on the accuracy of the measurements. So any call for more complex measurements should also emphasize the need for highly accurate measurements.

Figure 6 (and associated discussion): It would be very helpful if the authors would differentiate between the variation caused by location and that caused by environmental conditions. This should be possible if there are a large number of samples (the manuscript is somewhat ambiguous on the number of samples analyzed from the Surinam flights- it looks like there were 180 cartridges collected but it doesn't seem to say how many were used in the analysis. This is also the case for the greenhouse study). Since the aircraft flights are probably around the same time of day, the variation in figure 6 may be primarily driven by location rather than environmental conditions. This means that the correlation with isoprene could be more of a taxonomic phenomenon rather than a physiological one. Examining the variability associated with location may also be helpful for determining whether the difference between the Surinam and Finland sites is because of the type of forest. If the domination of the '-' enantiomer occurs only at some locations covered by the Surinam flights then this might indicate that it just depends on the plant species distribution of a location.

Page 9589, line 17. The phrase 'consistent with previous rainforest studies (Kesselmeier et al. 2000)' implies that the Kesselmeier manuscript describes the predominance of a-pinene in more than one study (which is not the case). The authors are correct that most tropical forest studies have found that a-pinene dominates total monoterpenes but the authors would need to reference other studies if they want to

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strengthen this point.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 9583, 2006.