Response to Reviewer 3

Many revisions have been incorporated in the revised manuscript. Some issues might still warrant more discussion. In particular the rather large difference between modelled and observed MVK+MAC concentrations should be investigated in more detail. Could a higher deposition velocity for MAC+MVK improve the comparison between model and observations? A sensitivity calculation could help determining upper limits (e.g. by setting MVK+MAC dep. velocities to the theoretical maximum); this could perhaps shed some light on whether the difference is largely due to underestimated deposition or caused by other external factors.

At page 10, line 11: After "MACR+MVK are over-predicted by the model in the late afternoon. ", "This over-prediction is discussed further in Section 4.2" is added.

At page 13, line 20: "The model significantly over-predicts MVK+MACR in the afternoon (Fig. 3b). The measured slope of MVK+MACR is highest in the morning hours (Fig. 3f) and is then relatively constant in the afternoon. The modelled slope of MVK+MACR increases throughout the day. These results suggest that the model is either producing MVK+MACR too rapidly or it is not being removed quickly enough. A model sensitivity run with a 50% increase in MVK+MACR deposition rate at the surface results in little effect on the mixing ratio (<1% average difference) and an average 38% increase in the slope. Hence it is unlikely that the modelled surface deposition is too low. The model does not include deposition to leaf stomata within the canopy. Karl et al. (2010) have demonstrated total integrated canopy deposition rates as high as 24 mm s^{-1} for MVK+MACR. MACR has also been shown to form secondary organic aerosols from photooxidation (Zhang et al., 2012) – a process which is not included in the model. Production of aerosols is supported by a concurrent study at the same location (Gordon et al., 2011) which found that the forest is a net source of aerosols. Both the lack of canopy deposition and aerosol production may account for the modelled over-prediction of MVK+MACR and should be included in future model versions."

New references:

Karl, T., Harley, P., Emmons, L., Thornton, B., Guenther, A., Basu, C., Turnipseed, A., and Jardine, K.: Efficient Atmospheric Cleansing of Oxidized Organic Trace Gases by Vegetation. Science, 330.6005, 816-819, 2010.

Zhang, H., Lin Y.-H., Zhang, Z., Zhang, X., Shaw, S. L., Knipping, E. M., Weber, R. J., Gold, A., Kamens, R. M., and Surratt, J. D.: Secondary organic aerosol formation from methacrolein photooxidation: roles of NOx level, relative humidity and aerosol acidity, Environmental Chemistry, 9(3), 247–262, 2012.

minor comments
Add units to y label on all figures.
Figure 2: add y- labels for aesquiterpenes
Figure3, Figure 4: add units to y axis instead of the figure caption.
Done.