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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The summertime Boreal forest field measurement intensive (HUMPPA-COPEC-2010): an overview of meteorological and chemical influences" *by* J. Williams et al.

Anonymous Referee #2

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This paper provides an overview of the field site, measurements employed and the air mass origin influences, of the HUMPPA-COPEC-2010 campaign, which was based in the Finnish Boreal forest during summer 2010. The paper serves as a valuable summary of the important aspects of the campaign, and a key starting point for readers of the special issue. While this type of paper is often light on science, it is necessary for such large collaborative field studies. The paper is generally well-written, and should be published subject to the authors addressing the following minor points.

Abstract, line 8: "higher proportion of southerly flow". Make clear what is meant by this.

Higher than what / when?

Page 15931, line 15: Assessment of response of forest ecosystem to enhanced ozone. Please add one or two sentences and references to suggest why you may expect these impacts, or what you might expect these impacts to be.

Page 15936. Characteristic turbulent timescale. Please describe how this is estimated or provide reference.

References to Arctic Haze (Pages 15939 / 15941). It is not immediately obvious why/how findings from this site will inform understanding of Arctic haze formation. Wouldn't the local dominance by vegetation emissions, even during periods of some anthropogenic influence, mean that the background aerosol and oxidative environment is very different from that expected in the remote Arctic? Also, it is not clear how e.g. pentane would be expected to contribute to such haze. Please better qualify these parts of the discussion.

In several places (Page 15934) there is discussion of the higher-than-average temperatures being a possible proxy for future climate. Can the authors provide a more quantitative comparison in terms of the magnitude of this summer 2010 warming in the context of expected regional future warming on different timescales?

Page 15935 & Fig. 3: Discussion and presentation of air mass origins. Have trajectories been filtered for their vertical displacement? i.e. is account taken of those leaving the boundary layer, which should not contribute (or at least much less) to mapping the influence of different sources, if they did not encounter the source in the BL? Figure 3 could be improved by showing more quantitatively the the origins of encountered air masses. Would it be possible to plot e.g. the mean and spread of different classes of trajectories associated with the three different air mass origin types?

Conclusions: This section is very short, and should be expanded slightly to summarise the main points from the preceding discussion on air mass origin, observed signatures

etc., to serve as a more useful summary.

Table 1: Would it be possible to add references where available for each technique/instrument. Perhaps this may make the table too large / unwieldy?

Typographical / editorial points - Page 15927, line 12: Does "Tropical" require capitalisation? - Page 15935, line 6: "lightening" should be "lightning". - Throughout: The term "specific humidity" is more usual than "specific moisture". Consider replacement. - Throughout: Be consistent with units for mixing ratio - either ppbv or nmol/mol, but not both.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 15921, 2011.