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Interactive comment on “An intercomparison study of analytical methods used for quantification of levoglucosan in ambient aerosol filter samples” by K. E. Yttri et al.

Anonymous Referee #4

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This manuscript reports the results of an inter-laboratory study for the quantification of monosaccharide anhydrides (aka anhydrosugars) based on a set of ambient aerosol samples which was strongly influenced by residential wood burning emissions during winter at a background site in Norway, using the most common chemical analysis techniques currently used for measurement of carbohydrates in aerosol particles in Europe.

The manuscript also presents a good overview of the analytical methods reported in the literature, as well as their application to atmospheric aerosol detection of anhydrosugars in various environments. While it is impossible to give a complete listing of all relevant references, especially as this is not a review paper, a number of ad-

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ditional studies could be cited as well, specifically those from outside of Europe, in order to give the reader a more comprehensive depiction of the utilization of the analytical methods presented here in other environments, including source and near-source biomass burning emissions.

Overall, there are no obvious technical issues and the paper is well structured, coherent, and concise. Therefore, the manuscript merits to be published in AMT upon consideration of a few points mentioned in the specific comments below.

Specific comments

1. Even prior to the work by Simoneit et al., levoglucosan was proposed as biomass burning tracer by Hornig et al. (1985) and Locker (1988), which could be cited in the introduction (page 7400).
2. Agricultural waste burning is an important source of anhydrosugars especially in Asia, which has been reported for several ambient and source emission studies, such as Fu et al. (2008), Oanh et al., (2011) or Wang et al. (2011). This can be mentioned on page 7400 as well. In another recent study (Engling et al, 2014) anhydrosugars were measured down-wind of peat fires in Indonesia (first paragraph, page 7401).
3. The stability of levoglucosan was also investigated for ambient aerosol following long-range transport to a remote island by Mochida et al. (2010), which can be mentioned in the discussion on page 7402.
4. It is not clear what "clean up" refers to (in line 19, page 7409) – does it perhaps include the entire sample preparation process, including extraction and filtration, rather than just the purification of the extract solution? This should be specified here.
5. When discussing the levoglucosan/mannosan ratio (in lines 22-26, page 7418), the authors may also want to mention that besides the distinction between hard wood and softwood, additional attempts have been made to qualitatively classify other types of biomass by using this ratio as well, such as described by Engling et al. (2009, 2013).

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