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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ambient concentrations of aldehydes in relation to Beijing Olympic air pollution control measures" *by* J. C. Gong et al.

Anonymous Referee #1

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I am reviewer number 1, and I appreciate all the changes the authors implemented to make this a better paper and the positive spirit that have adopted in dealing with my concerns.

However, I am still troubled by the differences in the aldehyde results and the final conclusions draw from this. In reading the Li et al paper (Atmospheric Environment, 44, 2632, 2010), these researchers point out the importance of meteorology and rainfall in addition to air pollution control measures in affecting HCHO levels before, during, and after the Beijing Olympics. In particular, these authors show that in addition to abundant rainfall the average boundary layer height was highest during the daytime during the olympics. Both tend to lower pollutant concentrations, including HCHO during the olympics. Unfortunately, this was not taken into account in the present paper.

Furthermore, Li et al. show using a statistical analysis based on correlations with CO and O3 to assess primary and secondary sources of HCHO that primary sources of HCHO are dominant before and during the olympics. Linear regressions on two days before the olympics Li et al. deduce (76% primary, 18% secondary, and 5% background) and (48% primary, 23% secondary, and 30% background) during the olympics. Thus they show a reduction in primary HCHO due to the controls put in place during the olympics and this is supported by a reduction in ambient measured HCHO during this time period. This is consistent with the acetaldehyde trends in the present paper but not the HCHO trends. In addition, the % HCHO contributions are at odds with the Li et al. paper, which indicates that in all cases primary HCHO dominates and that the stringent automotive controls reduced HCHO during the olympics. Thus, the authors need to reconcile these differences. Given that automotive HCHO/CH3CHO emissions are > 1, I would again expect that reductions in ambient measured CH3CHO during the olympics due to automotive controls would also translate to reductions in ambient measured HCHO levels, as has been shown by Li et al.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 19737, 2010.