

## ***Interactive comment on “Ground-based intercomparison of two isoprene measurement techniques” by E. Leibrock et al.***

**E. Leibrock et al.**

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Thank you very much for your detailed comments on our paper.

The experimental details concerning the CIMS you are asking for have been included in the revised version of the paper. This also includes a clarification of the following points you mentioned in your comment:

Both benzene reagent ions react at collision rate with isoprene to form the same product ion,  $C_5H_8^+(C_6H_6)$ , at 146 amu. Collision rates are 1.3 and  $1.1 \times 10^{-9} \frac{cm^3}{molec \cdot s}$  for monomer and dimer, respectively (see Leibrock and Huey, 2000). Nevertheless, by constantly monitoring both signals and with hourly calibrations, we minimized potential changes in the ratio and made sure that they could not affect the isoprene measurement. Isoprene sensitivity was not affected by ambient humidity levels; water clusters were not observed for either benzene cation (see also Leibrock and Huey, 2000).

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The main interference observed in the CIMS measurements clearly was present in air masses transported from the Denver metropolitan area: the normalized difference of GC and CIMS measurements was largest when the wind was from the south. On September 18th, a day with relatively high concentrations and good correlation, there was no wind from southerly directions between 140 and 250°. On September, 29, however, when concentrations were similarly high, but correlation poorer, basically all directions were present. September 30th and October 1st, the two days with low isoprene concentrations, were dominated by northeasterly and northwesterly winds, respectively; no southerly directions were present at all. The good correlation with NO<sub>x</sub> additionally suggests an anthropogenically influenced source. You are right in pointing out an additional interference in clean conditions, when the wind was coming from these remote sites (see sector from 300 to 350° in Fig. 5). As we discussed in our answer to the other referee's comment (RC S333), this may very well be due to MBO, a biogenic compound known to be emitted from North American pine forests (e.g. Goldan et al., 1993; Harley et al., 1998; Schade et al., 2000). We know that MBO as well as C<sub>5</sub>H<sub>8</sub> conjugated dienes interfere with our isoprene measurement. Basically, any compound with mass 68 amu and an ionization potential of less than 9.1 eV is likely to interfere with our technique. Without the introduction of a tandem mass spectrometric technique however, we cannot be sure about the nature of such possible interfering compounds. We clarified this point in the revised version of the paper.

Figure 2 has been modified with different markers according to your suggestion.

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