

Interactive comment on “Measuring atmospheric naphthalene with laser-induced fluorescence” by M. Martinez et al.

Anonymous Referee #2

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The authors present a new method for measuring naphthalene in the atmosphere as a 'by product' of a technique used for OH. It is highly relevant to present these findings since naphthalene, a higher molecular weight VOC but existing primarily in the gas phase, is in a class of very much under-sampled species in the atmosphere. When compared to traditional measurements made for example using high volume sampling and GC-MS, the time resolution improvements alone are enormous.

However the nature of the experimental technique described is of some significance here, not in terms of the validity or accuracy which looks excellent and highly sensitive, but whether realistically anybody is going to chose to use such an expensive methodology to measure a single PAH? If it is used as a marker of pollution by the handful of existing OH fluorescence instruments that is one thing, but if it could be developed into a lower cost and more universal instrument then that would be of much greater

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significance.

This is where I feel it would be important to have some more information that might address some of these questions: What about other PAH and alkylated PAH? There are dozens if not hundreds of polycyclic aromatic compounds at least partially existing in the gas phase, which would be good candidates for measurement? The naphthalene spectrum was measured in the lab by the authors in this study, but what is known about the fluorescence spectrum of other polyaromatic species in these UV wavelength regions? Was it possible to determine any other PAH using the authors existing apparatus or is there only a very narrow wavelength range available with their laser? How feasible would an instrument dedicated to PAH measurements be? Would there be any experimental simplifications that could be made to make the instrumentation more attractive to a wider community (cell sizes, pressures and pumping rates, less narrow linewidth laser etc)?

It would also be very useful to know whether the authors have any feeling for the detection of naphthalene that may have been particle bound. I appreciate that under most conditions the majority of naphthalene is gas phase but for other PAH measurements this may be of significance, particularly if there is evidence that the technique may be gas phase selective.

The data presented is generally for illustrative purposes rather than as stand alone, but was any other VOC data available for any of the campaigns? The good correlations with NO_x (notably in the NY2001 campaign), would point to combustion sources as highly significant at this location, but if other hydrocarbon data indicative of evaporative emissions was available for comparison, this might go some way to estimating the dominate urban source something that is still unclear for naphthalene.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 343, 2004.

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