

## ***Interactive comment on “Distribution of lead in single atmospheric particles” by D. M. Murphy et al.***

### **Anonymous Referee #3**

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Lead is a pollutant that is almost omnipresent in yesterday's and today's atmosphere. In the last decades a large number of studies have documented the emissions and ambient concentrations of particulate lead, caused by industry and until roughly two decades ago by leaded fuel for gasoline cars. The widespread ban of leaded fuel has effected a drastic decrease in lead ambient concentrations, which has been thoroughly shown in literature. With lead being somewhat out of the main focus of relevance since then, the picture of today's lead burden of the atmosphere is not fully clear.

The work by Murphy et al. attempts to obtain a better overview on the fate of airborne lead in the atmosphere. The authors make use of single particle analysis techniques, to investigate the lead fraction of collected aerosol particles. To derive a representative snapshot of the atmosphere from single particle analysis is generally a difficult issue

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due to the low representativeness of an individual particle. This is however not a problem in the study by Murphy et al., since they base their exploration on a very impressive amount of experimental data. The manuscript is well written, scientifically sound and gives an excellent overview over the current lead burden of the atmosphere. The only issue that I slightly miss in the discussion section is a brief discussion on the advantage/disadvantage of single particle analysis compared to bulk analysis techniques.

Minor issues:

The Introduction and Results sections add up to 13 pages, while Discussion and Conclusions only count 7 pages all together. The first part of the manuscript seems somewhat long, but I have difficulties to come up with explicit ideas to shorten the introduction.

Page 3768, lines 15-20: Is the winter maximum of lead at the eastern sites correlated with other pollutants (e.g. PM<sub>2.5</sub>)? In this case the elevated concentrations might be the result of different wintertime meteorology.

Page 3788, line 27: Replace "Sienfeld" with "Seinfeld"

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 3763, 2007.

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