Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2020-25-RC1, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Resonance-Enhanced Detection of Metals in Aerosols using Single Particle Mass Spectrometry" *by* Johannes Passig et al.

Anonymous Referee #1

Received and published: 21 February 2020

General Comments

In this study, the authors combined laboratory experiments and field measurements to demonstrate resonant ionization enhancement of particle-bound metals, i.e., Fe, Mn, Zn, and Li, by single particle mass spectrometry (SPMS). The authors show a new way to improve the detection capabilities of single particle mass spectrometer to specific species in aerosol particles. A tuneable laser system was used in the laboratory to investigate the wavelength-dependent resonance effects, which rarely applied in SPMS. Given the resonant ionization with KrF excimer laser (wavelength=248 nm), ambient particle-bound iron can be detected with much higher sensitivity, such that its source

information can be well preserved. Considering the profound impact of particle-bound metals in marine environments and for human health, this study is quite helpful also in a broader research field. However, the method description is inadequate, some laboratory measurements and more discussions are needed. The atmospheric implication section should be strengthened to better fit for this journal. Therefore, I recommend it to be published after major revisions.

Please find the major and minor comments in the supplement.

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2020-25/acp-2020-25-RC1-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-25, 2020.