

Interactive comment on “Increase of the particle hit rate in laser single particle mass spectrometer by pulse delayed extraction technology” by Ying Chen et al.

Anonymous Referee #3

Received and published: 22 September 2019

Chen et al. described a modified SPAMS to increase particle hit rate using a pulse delayed extraction technology. Indeed, the increase in hit rate is an improvement of instrumental performance. The attempt is exciting and novel. However, there are still concerns about the manuscript. Therefore, I recommend a major revision of the manuscript.

1. The delaying of ions, with an extra of 100 ns, can lead to secondary ion-ion and ion-neutral reactions. The artifact could cause inevitably shift of mass spectra, and the results could not be compared directed with current literature. Therefore, I would like to see some comparisons in both lab and field results between this new model and the

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commercialized instruments. Related discussion is also necessary. 2. Increase of hit rate is undoubtedly an improvement of instrumental performance. However, single particle methodology is a partially sampling, meaning that the representation of full particle population is a major concern. The limited increase of hit rate and the unknown artifact, the balance should be considered cautiously. Again, the reviewer would like to see a discussion on this issue. 3. A serious proof-reading is necessary. 4. In Introduction, the reviewer recommends introducing a brief history of SPMS development. 5. The organization of the Method part should be improved. Please pay more attention to how your delaying system is designed. 6. Figure 2, it is not necessary to show the Y-axis in a logarithmic way, a linear one is enough. 7. Section 3.3, I would like to see some mass spectra of field (environment) particles. 8. Conclusion needs to be re-written. Please focus on what you did, the result, the benefit, and scientific implications. 9.

Minor revisions 1. Line 16, the full spell of DC is not provided. 2. “Delay extraction” is not proper because delay is used as a noun or a verb; “Delayed extraction” could be more appropriate. 3. Line 32, some high cited literature (Pratt and Prather, 2012) is not cited. 4. The space between paragraphs was not apparent; please add space into them.

Ref. Pratt, K.A., Prather, K.A., 2012. Mass spectrometry of atmospheric aerosols—Recent developments and applications. Part II: On-line mass spectrometry techniques. Mass Spectrom. Rev. 31, 17-48.

Please also note the supplement to this comment:

<https://www.atmos-meas-tech-discuss.net/amt-2019-163/amt-2019-163-RC2-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-163, 2019.

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