Atmospheric Measurement Techniques Discussions

Atmos. Meas. Tech. Discuss., referee comment RC1
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Comment on amt-2021-271

Anonymous Referee #1

Referee comment on "Design, characterization, and first field deployment of a novel aircraft-based aerosol mass spectrometer combining the laser ablation and flash vaporization techniques" by Andreas Hünig et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-271-RC1, 2021

General comments

In this study, the authors present a novel mass spectrometer ERICA (ERC Instrument for Chemical composition of Aerosols), which combines two ionization techniques, i.e., laser ablation and the flash vaporization with electron impact ionization. Given the complementary strengths of the techniques, ERICA allows for in-situ and real time measurements of size and chemical composition of the aerosol particles, provides qualitatively information of almost all the particulate components and the quantitative information of the non-refractory components. The authors have done comprehensive laboratory and ground-based field measurements to characterise this instrument and tried to demonstrate its improved chemical characterization capability. As shown in the manuscript, such a hybrid instrument with compact and light-weight design is good for aircraft measurement. This study would be quite useful for atmospheric science research, especially in the mass spectrometry community. However, the presentation is not very well structured and not clear enough in current version, which needs to be improved. In addition, the authors should do more literature research on single particle mass spectrometry (SPMS) and aerosol mass spectrometer (AMS) to make correct statements. 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://amt.copernicus.org/preprints/amt-2021-271/amt-2021-271-RC1-supplement.pdf