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Statistical Analysis of Aspirated ESI Droplet Signatures in Non-Summed Mass Spectra Compared to APCI

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Experimental Set Up & Method

- Usual TOF mass spectra are the result of the summation of 10^5 non-summed single spectra
- **Bruker micrOTOF** provides the setting to record about 5 non-summed single spectra per second
- Auxiliary SEM detector is coupled to an oscilloscope to monitore the ion current

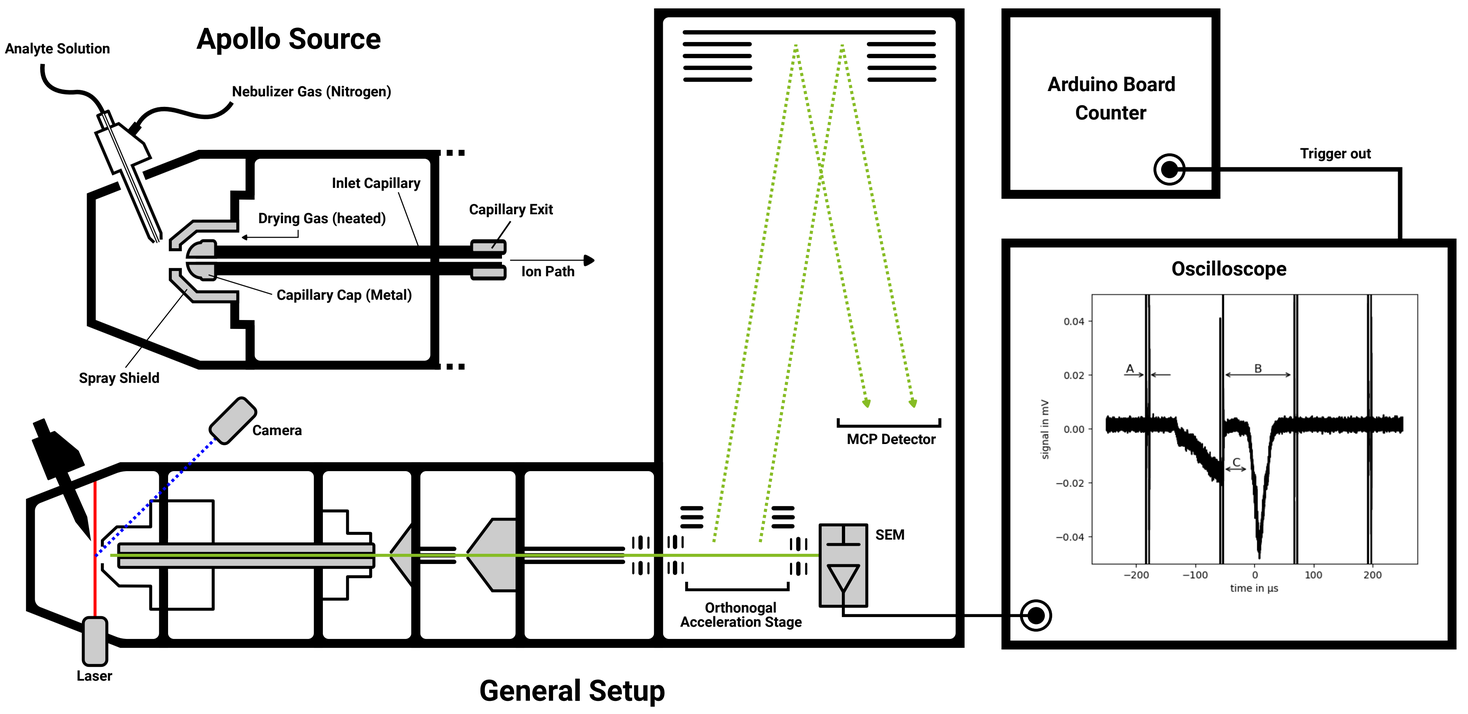

Fig. 1 *Scheme of the used Bruker micrOTOF and Apollo Source with custom configurations*

Intensities Distribution of Non-Summed Mass Spectra

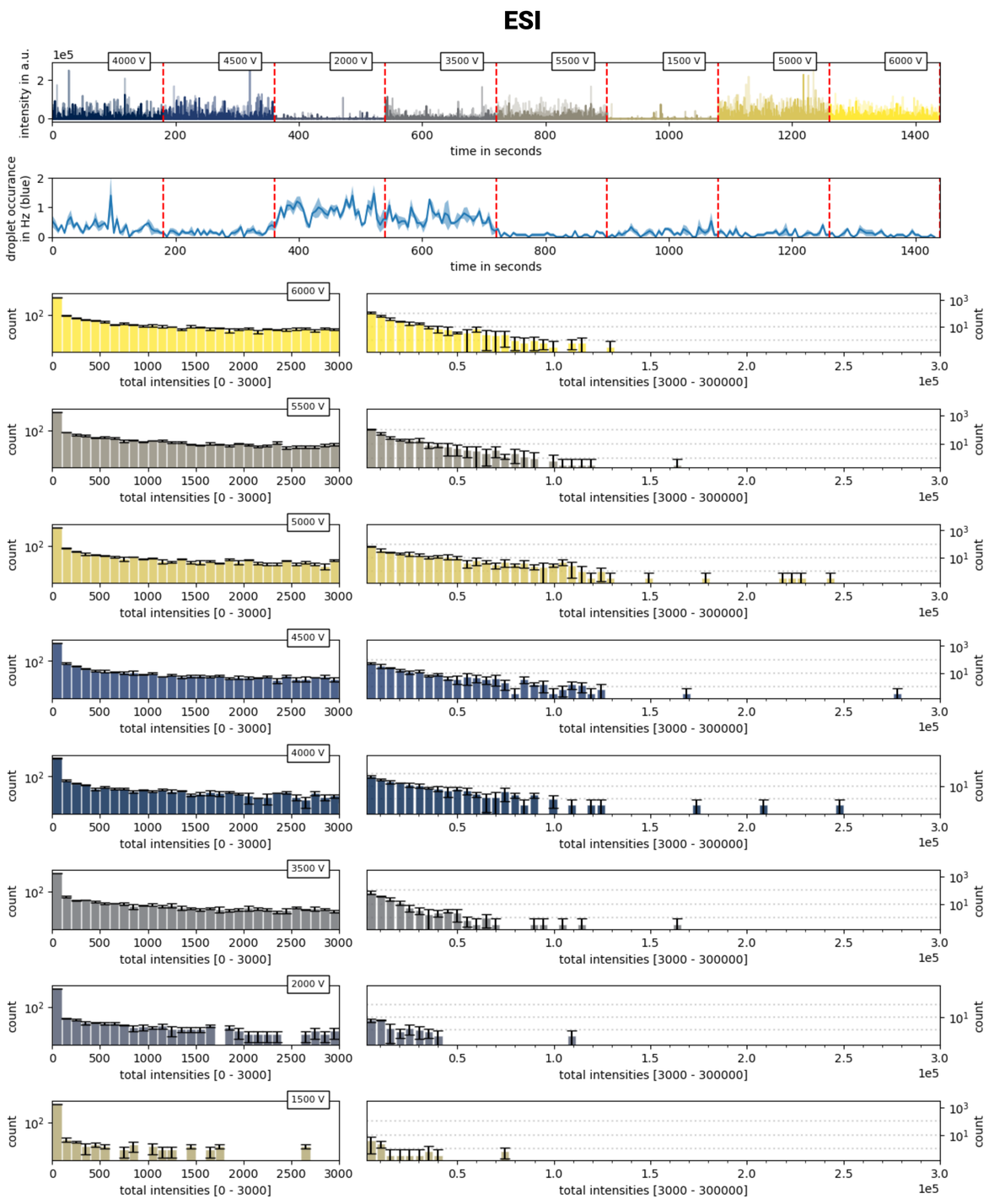

Fig. 2 *Total intensities distribution of the non-summed ESI spectra for different capillary voltages. Also displayed are the TIC (1st panel) and the ion burst frequency (2nd panel).*

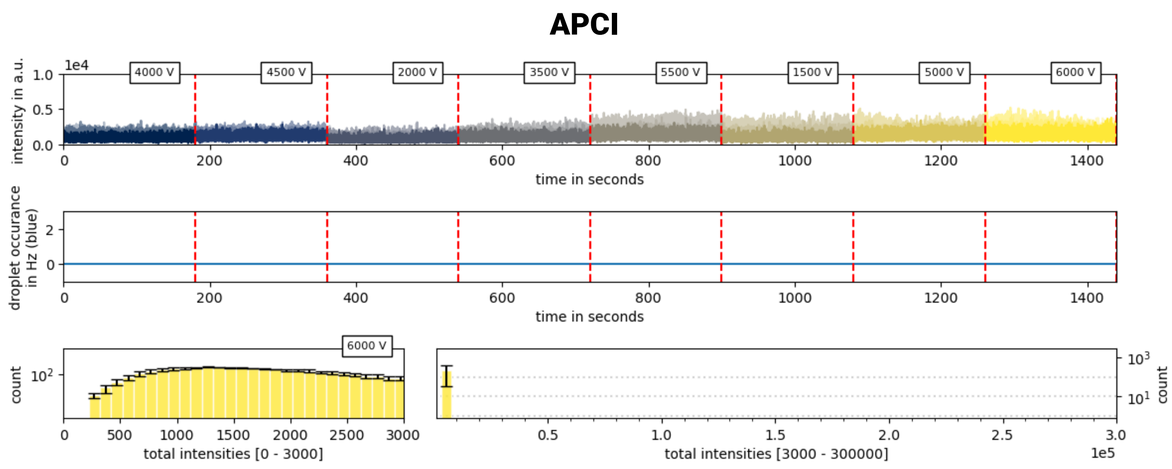

Fig. 3 *Total intensities distribution of the non-summed APCI spectra. Also displayed are the TIC (1st panel) and the ion burst frequency (2nd panel).*

- Majority of ESI single spectra are empty; scattered spectra with significantly higher total intensity
- APCI single spectra are equaly distributed and within a narrow range of total intensities
- Almost no empty spectra with APCI

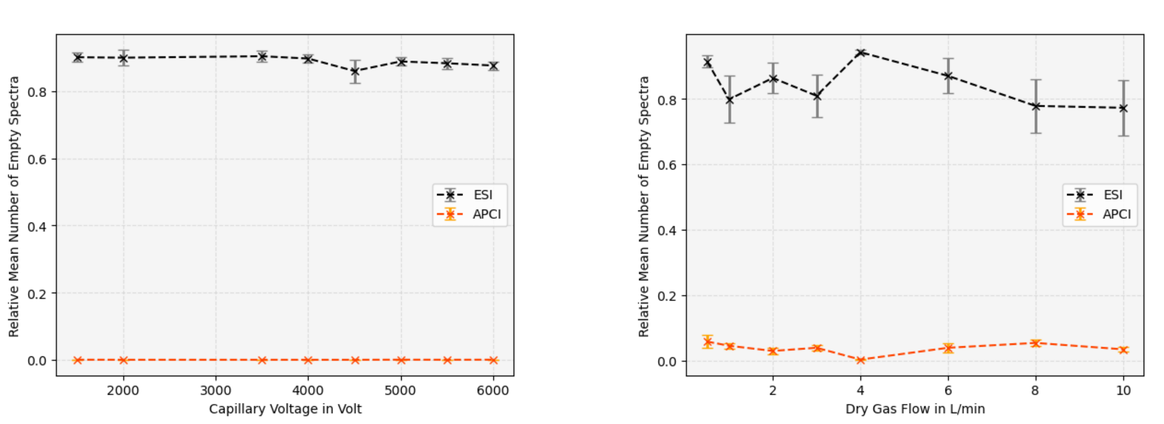

Fig. 4 *Ratio of empty single spectra and the varied capillary voltage (left) and varied dry gas flow (right) for three replicate experiments in each mode, ESI and APCI.*

Conclusions

- Summated TOF mass spectra intensity comes from a small number of high intense non-summed mass spectra, the majority of the spectra is empty
- High intense non-summed spectra are connected to ion bursts, observed at the SEM
- Total intensity distribution is influenced by source parameters (ESI more than APCI)
- Removal of droplets would probably lower the overall intensity drastically
- Where und when does the droplet fission into burst occure?