APODIZATION SPECIFIC PEAK FITTING IN CHARGE DETECTION MASS SPECTROMETRY

Tech ID: 32867 / UC Case 2022-148-0

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250226194	07/10/2025	2022-148

BRIEF DESCRIPTION

Short-time Fourier transforms with short segment lengths are typically used to analyze single ion charge detection mass spectrometry (CDMS) data either to overcome effects of frequency shifts that may occur during the trapping period or to more precisely determine the time at which an ion changes mass, charge or enters an unstable orbit. The short segment lengths can lead to scalloping loss unless a large number of zero-fills are used, making computational time a significant factor in real time analysis of data.

To address the foregoing deficiencies in prior approaches, UC Berkeley researchers have developed an apodization specific fitting that can lead to a 9-fold reduction in computation time compared to zero-filling to a similar extent of accuracy. This makes possible real-time data analysis using a standard desktop computer and capable of separating ions with similar frequencies.

SUGGESTED USES

- analyze single ion charge detection mass spectrometry (CDMS)

ADVANTAGES

- improved resolution, charge measurement and data analysis speed
- >20% increase in S/N
- eliminates computational barriers by enabling real time processing of CDMS data on a laptop computer

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Multiplex Charge Detection Mass Spectrometry
- Sequential Pass Express Charge Detection Mass Analyzer
- Ambient infrared laser ablation mass spectrometry (AIRLAB-MS) with plume capture by continuous flow solvent probe
- Aerosol Ionization For Charge Detection Mass Spectrometry Ion Mobility Analysis

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INVENTORS

- Williams, Evan R.

OTHER INFORMATION

CATEGORIZED AS

- **Medical**
  - Research Tools
- **Sensors & Instrumentation**
  - Analytical
  - Physical Measurement
  - Scientific/Research

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