

# FULL SIGNAL UTILIZATION IN CHARGE DETECTION MASS SPECTROMETRY

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## PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2024/243592	11/28/2024	2023-139

## BRIEF DESCRIPTION

UC Berkeley researchers have developed several methods that take advantage of all of the information contained in ion signals in charge detection mass spectrometry (CDMS). Unlike most conventional types of mass spectrometry (MS), which rely on mass-to-charge ratio ( $m/z$ ) measurements of ensembles of ions, CDMS instead makes direct measurements of the mass of individual ions. CDMS has recently gained significant popularity in the analysis of large biomolecules, nanoparticles, and nanodroplets because it is one of very few methods that can characterize these analytes. State-of-the-art CDMS instruments incorporate ion traps and signals from individual trapped ions are used to find the mass, charge, and energy of these ions. Previously used techniques have used Fourier transform (FT)-based analyses, but only use the fundamental and/or second harmonic frequency and amplitude as the basis of the measurement. The significant additional information contained in the higher order harmonic frequencies and amplitudes of the ion signal is fully utilized in the novel methods comprising this invention and large improvements in measurement uncertainties are realized as a result.

## SUGGESTED USES

- » Charge detection mass spectrometry

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ Apodization Specific Peak Fitting In Charge Detection Mass Spectrometry
- ▶ High Performance Charge Detection Mass Spectrometry Without Ultra-High Vacuum
- ▶ 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

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

### RELATED CASES

2023-139-0

