

# SEQUENTIAL PASS EXPRESS CHARGE DETECTION MASS ANALYZER

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## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	<a href="#">20250279272</a>	09/04/2025	2023-040

## BRIEF DESCRIPTION

Charge detection mass spectrometry (CDMS) effectively bridges the gap in mass measurement technologies and is well suited to the analysis of aerosol-borne viruses and even bacteria such as tuberculosis. CDMS can provide mass measuring accuracies for ions with masses above 500 kDa that are comparable to more expensive conventional instruments and, most importantly, this technology can be applied to ions that are too large (10+ MDa) or heterogeneous to measure using conventional MS. Single pass CDMS instruments have been used to measure masses of large polymers, nanodroplets, dust, and bacterial spores. Mass measurements of MDa-sized PEG molecules and polystyrene nanoparticles (50-110 nm diameter) using an array of 4 detection tubes positioned between the trapping electrodes of an electrostatic ion trap (EIT) have been previously reported. However, no commercial CDMS instrumentation yet exists that can measure masses in the range of 10's to 1000's of MDa.

UC Berkeley researchers have developed a charge detection mass analyzer which is designed to enable mass measurements of individual ions at rates greater than 10,000 ions per second, ~1000x faster than current state-of-the-art charge detection mass spectrometry instrumentation and other methods that measure molecules >1 MDa in size.

## SUGGESTED USES

- » a sequential pass express charge (e) detection (SPEeD) mass analyzer designed for highly sensitive, rapid mass measurements of high mass (>1 MDa) analytes.

## ADVANTAGES

- » SPEeD analyzer enables high throughput and sensitivity because ions merely need to pass through the series of detectors a single time for a mass measurement to be made.

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Apodization Specific Peak Fitting In Charge Detection Mass Spectrometry](#)
- ▶ [Multiplex Charge Detection Mass Spectrometry](#)
- ▶ [Ambient infrared laser ablation mass spectrometry \(AIRLAB-MS\) with plume capture by continuous flow solvent probe](#)

## CONTACT

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## INVENTORS

- » Williams, Evan R.

## OTHER INFORMATION

### CATEGORIZED AS

- » [Sensors & Instrumentation](#)
- » [Physical Measurement](#)
- » [Scientific/Research](#)

### RELATED CASES

2023-040-0



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