



## ORBITRAP : A HIGH RESOLUTION ACCURATE MASS SPECTROMETRY

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### ABSTRACT:

In mass spectrometry, Orbitrap is an ion trap mass analyzer comprising of an outer barrel-like electrode and a coaxial inner spindle-like electrode that traps ions in an orbital motion around the spindle. The invention of the Orbitrap analyzer and its evidence of principle was proposed by Makarov at the end of the 1990s. The orbitrap is frequently used in research application to clarify low abundance, high complexity or otherwise problematic samples, including those collected in proteomics, lipidomics, clinical research and forensic toxicology, food, beverages and metabolomics are driving the demand for mass spectrometers that have high performance but modest power requirements, size, and cost. In the Orbitrap mass/charge values are measured from the frequency of harmonic ion oscillations, along the axis of the electric field, experienced by the orbitally trapped ions. Features of the Orbitrap at its present phase of development comprise high mass resolution (up to 150,000), large space charge capacity, high mass accuracy (2–5 ppm), a mass/charge range of at least 6000, and dynamic range greater than 10. In addition, simple design and high space-charge capacity make it appropriate for tackling complex in which high performance is mandatory. The Orbitrap mass analyzer is the first high-performance mass analyzer that employs trapping of ions in electrostatic fields. It exemplify the compelling potential of Orbitrap-based mass spectrometers as (ultra) high-resolution platforms, not only for high-end proteomic applications, but also for repetitive targeted analysis.

**KEYWORDS:** Orbitrap, high mass resolution, proteomics, high mass accuracy

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