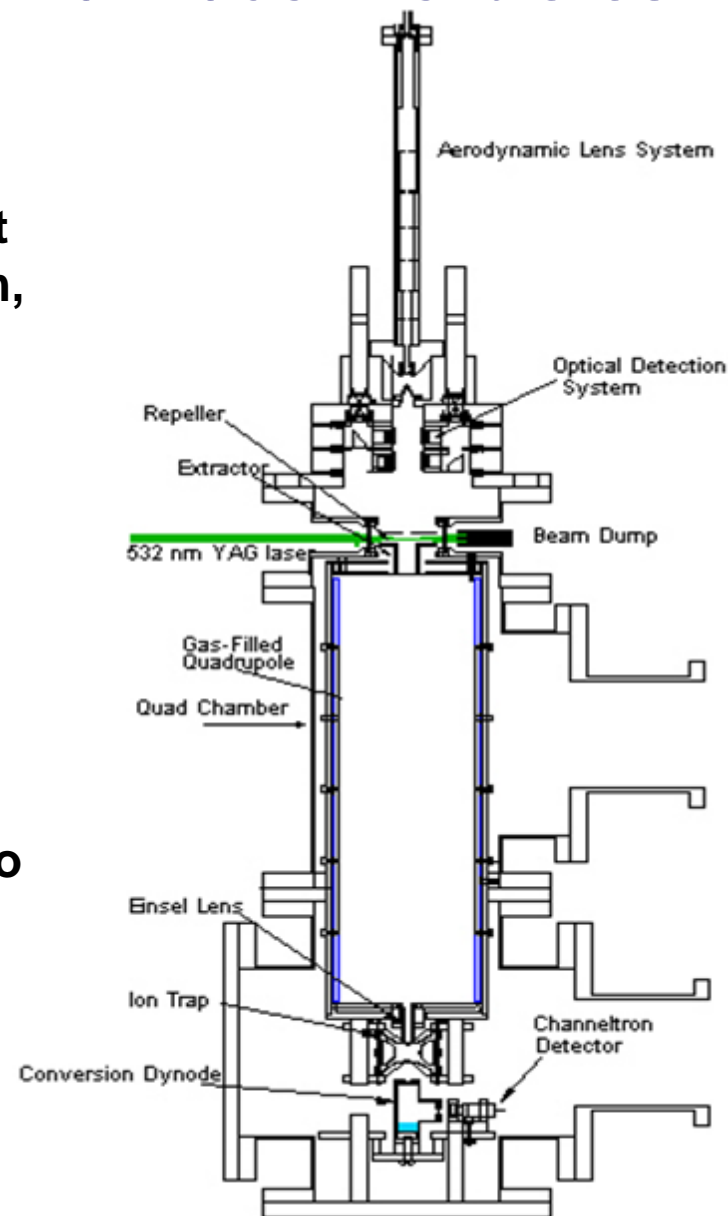


# Isotope Ratio Mass Analysis for Individual Particles

Atmospheric aerosols are sampled into vacuum using an aerodynamic lens inlet system that collimates them into a tight beam of particles that can be separated from the carrier gas. In vacuum, individual particles are aerodynamically sized by light scattering-based time-of-flight. When the detected particles reach the ionization region an intense, focused 532 nm laser atomizes and cationizes the entire particle. The enormous number of ions created are then injected into a gas-filled large radius linear ion trap. Collision with the buffer gas reduces the multiply-charged atomic ions to single charges and permit them to be captured and held for on-demand injection into a mass analyzer. Because the particle is completely ionized, the ion intensities should directly correlate with the atom concentrations in the particle. This technique can be used to measure the isotope ratios of elements for individual particles with good precision.



*Schematic of the instrument for measuring isotope ratios of airborne particles with an ion trap mass analyzer*