

A Simple Reservoir Computing Approach to Determining Microparticle Mass-to-Charge Ratio

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Abstract. In this theoretical study, we implement a reservoir computing system to simulate mass-to-charge ratio determination for a single trapped microparticle. To achieve this, we numerically obtained trajectory images of a single silica microparticle in a quadrupole ion trap in air at room temperature. We demonstrated the capacity of the RC system to distinguish both between different types of trajectories and within identical trajectory classes. The system quantified the mass-to-charge ratio of the particles with corresponding determination errors of approximately 7% and 10%.

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