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Characterization and Mitigation of Anomalous Motional Heating in Surface-Electrode Ion Traps ROBERT MCCONNELL, COLIN BRUZEWICZ, JOHN CHIAVERINI, JEREMY SAGE, MIT Lincoln Laboratory — Anomalous motional heating represents a major obstacle to scalable quantum information processing with trapped ions. We present experimental investigations to understand and overcome anomalous motional heating in surface-electrode ion traps. We characterize the observed heating rate of a single trapped ion in terms of its dependence on trap frequency and temperature and compare with several theoretical noise models. We also investigate the possible amelioration of this effect through different surface preparation techniques.

Robert McConnell
MIT Lincoln Laboratory

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