

Abstract Submitted
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Multi-tone RF generation for trapped-ion control with low-latency feedback¹ MARTIN STADLER, VLAD NEGNEVITSKY, UTKU ALTUNKAYA, MACIEJ MALINOWSKI, KARAN MEHTA, CHI ZHANG, THANH-LONG NGUYEN, CAGRI OENAL, JONATHAN HOME, ETH Zurich — The complexity of classical control systems for trapped-ion experiments is increasing steadily with the need for more complex control of laser pulse shapes and fast-feedback for quantum error correction as well as classical feedback control. I will give an overview of our in-house developed control system which is capable of performing integrated feedback to stabilize laser pulse intensities during a pulse sequence. We are currently implementing a second generation using one GS/s arbitrary waveform generator driven by multiple independent DDS cores per channel. This allows the use of multiple frequency tones per channel, which we have used to cancel spurious frequency components coming from higher-order effects in AOMs when driven with two tones e.g. for a Mimer-Srensen gate. Additional features include pulse area stabilization with 1 micro-second feedback latency. I will put the use of this system into the context of recent experiments working with micro-fabricated ion traps.

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