Abstract Submitted
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An Error-corrected, Universal, Re-configurable, Ion-trap Quantum Archetype[1] KRISTIN BECK, MARKO CETINA, MICHAEL GOLDMAN, LAIRD EGAN, Joint Quantum Institute, University of Maryland Department of Physics, College Park 20742, CHRIS MONROE, Joint Quantum Institute, University of Maryland Department of Physics, College Park 20742 and IonQ, Inc., College Park, MD 20740 — The EURIQA project is a collaboration between universities and industrial partners that is implementing a systematic, top-down approach to constructing a complex quantum processor based on trapped ions. As part of the LogiQ program, our goal is to use quantum error correction to realize an encoded logical qubit. The system uses Yb+ ions, which have an optically-accessible qubit state with long coherence times and gate fidelities exceeding 99% [1]. We will present the status of the development and integration of the state-of-the-art system underway at JQI/UMD. Our system relies on micro-fabricated traps, parallel addressing of individual ions, and multispecies operation to address the challenges of implementing a logical qubit. [1] N. M. Linke et al., Proc. Natl. Acad. Sci. 114, 13 (2017)

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