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Progress towards a metastable RF squid (MRFS) qubit ARCHANA KAMAL, Massachusetts Institute of Technology, ANDREW KERMAN, MIT Lincoln Laboratory, SIMON GUSTAVSSON, XIAOYUE JIN, FEI YAN, Massachusetts Institute of Technology, TED GUDMUNDSEN, DAVID HOVER, ADAM SEARS, JONILYN YODER, MIT Lincoln Laboratory, TERRY ORLANDO, Massachusetts Institute of Technology, WILLIAM OLIVER, Massachusetts Institute of Technology, MIT Lincoln Laboratory — The MRFS qubit [1] consists of an RF squid with a very high loop inductance, and whose two lowest quantum states are very well-defined, equal and opposite persistent supercurrents. These states can be strongly decoupled from each other, such that spontaneous electromagnetic decay processes of the excited state are extremely slow. Also, the large loop inductance suppresses the magnetic flux sensitivity of the design. We have realized these large inductances with NbN nanowires whose kinetic inductance is around 0.5 ?H. We will discuss experimental progress in measuring MRFS qubits fabricated using these inductors, and expected improvements in coherence. Future directions include studying the dynamics of quantum phase slips through these nanowires. [1] A. J. Kerman, PRL 104, 027002(2010). This research was funded in part by the Office of the Director of National Intelligence (ODNI), Intelligence Advanced Research Projects Activity (IARPA); and by the Asst Secretary of Defense for Research & Engineering under Air Force Contract number FA8721-05-C-0002. All statements of fact, opinion or conclusions contained herein are those of the authors and should not be construed as representing the official views or policies of IARPA, ODNI or the US government

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