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Engineering Signal Integrity in Multi-qubit Devices: Part II MEHRNOOSH VAHIDPOUR, WILLIAM O'BRIEN, ANDREW BESTWICK, JOEL ANGELES, JON TYLER WHYLAND, DIEGO SCARABELLI, MARIUS VILLIERS, MICHAEL CURTIS, ANTHONY POLLORENO, MICHAEL SEL-VANAYAGAM, ALEXANDER PAPAGEORGE, NICHOLAS RUBIN, CHAD RIGETTI, Rigetti Quantum Computing — Rapidly increasing complexity of quantum hardware presents novel engineering challenges in cryogenics and microwave design. The issue of signal integrity comes to the forefront when designing a collection of individually-addressable qubits that share an electromagnetic environment. Engineering that environment properly is imperative to reducing cross-talk and loss, and ensuring that gate operations can be performed with high fidelity. Recent progress in novel fabrication techniques and practice is presented, showcasing a set of advancements that significantly improve signal isolation and reduce loss.

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