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Frequency and sensitivity tunable microresonator array for high-speed quantum processor readout EMILE HOSKINSON, J. D. WHITTAKER, L. J. SWENSON, M. H. VOLKMANN, P. SPEAR, F. ALTOMARE, A. J. BERKLEY, D-Wave Systems, B. BUMBLE, Jet Propulsion Laboratory, P. BUNYK, D-Wave Systems, P. K. DAY, B. H. EOM, Jet Propulsion Laboratory, R. HARRIS, J. P. HILTON, M. W. JOHNSON, D-Wave Systems, A. KLEINSASSER, Jet Propulsion Laboratory, E. LADIZINSKY, T. LANTING, T. OH, I. PERMINOV, E. TOLKACHEVA, J. YAO, D-Wave Systems — Frequency multiplexed arrays of superconducting microresonators have been used as detectors in a variety of applications. The degree of multiplexing achievable is limited by fabrication variation causing non-uniform shifts in resonator frequencies. We have designed, implemented and characterized a superconducting microresonator readout that incorporates two tunable inductances per detector, allowing independent control of each detector frequency and sensitivity. The tunable inductances are adjusted using on-chip programmable digital-to-analog flux converters, which are programmed with a scalable addressing scheme that requires few external lines.

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