

Operation of a Single Flux Quantum 4-stage Shift Register Fabricated with Ramp-edge Junction Technology.

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We have fabricated and tested a single flux quantum 4-stage shift register with ramp-edge junction technology. $\text{YBa}_2\text{Cu}_3\text{O}_x$ (YBCO) Josephson junctions were produced by employing an *in situ* ion beam treatment of the edge surface prior to counterelectrode deposition. No additional barrier layer was deposited. Binary data sequences of "1000", "1010", "1011," and "1111" were successfully loaded and shifted in the circuit by using a computer controlled digital measurement set-up. The two read SQUIDs placed next to each side of the shift register were used to sense all the individual data states. By operating the circuit with the proper current pulses, we observed no errors during at least 12 hours operation for all the data sequences.

keywords : Single flux quantum, Shift register, Ion beam treatment