

# Rapid Characterization of Josephson Junction Devices Using a Fast Turnaround Cryostat

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We present a rapid measurement approach for Josephson junction (JJ) devices aimed at accelerating the feedback loop in the fabrication and optimization of superconducting circuits, particularly qubits. Using a kiutra L-Type Rapid cryostat equipped with an automated switching system, we achieve turn-key characterization of JJs within four hours, including cool-down, measurement, and warm-up cycles.

This setup enables precise determination of critical current, normal-state resistance, and switching dynamics across a broad temperature range, while significantly reducing turnaround time compared to conventional dilution refrigerator systems. The approach supports high-throughput testing of large JJ batches, improving the efficiency of parameter optimization and fabrication yield in superconducting device development. By combining automation with a compact cryogenic platform, this method offers a scalable solution for rapid prototyping and quality control in next-generation quantum computing architectures.

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