

# 2K, 300mm Wafer Level Characterization of Josephson Junctions for Transmon Qubits

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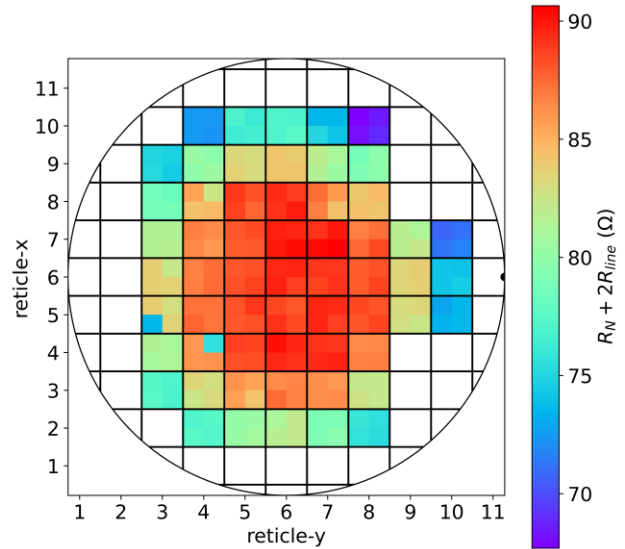
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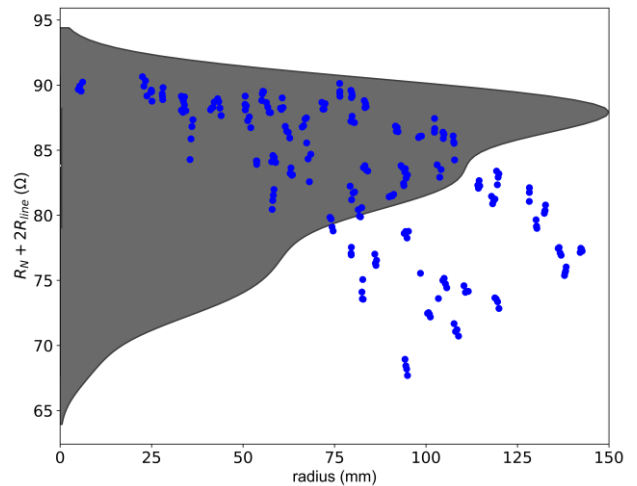
## Abstract

Transmon qubits are the leading physical qubit realisation in terms of generalist quantum computers. The essential component of the Transmon qubit circuit is the Josephson junction. This talk will present the first cryo-statistical 2K characterization of Josephson junctions at full 300mm wafer level. Analysing the quality and homogeneity of Josephson junctions (different sizes) on the whole wafer to address their optimisation and provide a selection basis for Transmon qubits. The Josephson junctions are fabricated in an industrial silicon-based process.

## Figures



**Figure 1:** Wafer map of the normal state resistance  $R_N$  of a  $2\ \mu\text{m}$  square Josephson junction, 232 in total over a 300mm wafer obtained at 2K from I-V 2-point measurements.



**Figure 2:** Normal state resistance  $R_N$  of a  $2\ \mu\text{m}$  square Josephson junction with kernel density estimation applied over the wafer radius, 232 in total obtained at 2K from I-V 2-point measurements.