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## **【533】 Enhancing quantum phase fluctuations in qubits with geometric superinductance**

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Characteristic impedance in superconducting quantum circuits determines whether the ground state wavefunction is dominated by charge or phase fluctuations. The crossover occurs at  $RQ = 6.45 \text{ k}\Omega$  above which the charge fluctuations are suppressed below  $2e^-$ . Most interesting is the behavior of the Josephson junction (JJ), which acts as a non-linear inductor at low impedance and as a non-linear capacitor in the opposite limit. We explore this limit by shunting the JJ with a geometric inductor formed a superconducting high density planar coil. This element maintains a single uninterrupted wavefunction and offers high reproducibility, linearity and the ability to couple qubits magnetically.

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