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## Compact and high quality microwave resonators made from superconducting aluminium-oxide wires.

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One aspect of state of the art superconducting circuits are low loss inductive elements, e.g. for resonators or qubit loop inductances.

We present a novel approach for compact and high quality microwave circuits using thin film wires made from superconducting aluminium-oxide. Due to the nano-scale grain size, the material was mostly investigated with the focus on the intrinsic granularity and at low frequencies in the past. The in the film growth process added oxygen impurities alter the sheet resistance, superconducting transition temperature and therefore also the kinetic inductance of a wire.

At moderate film thicknesses of around 20nm, sheet resistances in the kOhm range can be obtained, such that the kinetic inductance of superconducting wires dominates the total inductance.

We show measurements of microwave coplanar waveguide resonators with high wave impedance and therefore compact design. At milli-Kelvin temperatures, quality factors as high as 1M have been obtained.

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