Thin film evaluations by means of superconducting resonator
- Reveal of microwave properties of thin films due to superconductivity -

**Motivation**

Lumped element superconducting resonators have a large Q (~10^6) value and its resonant frequency, resonant peak shape, and phase circle are quite sensitive to the changes of inductance and/or capacitance. Using this sensitivities, dielectric thin films can be evaluated.

**Originality**

The dielectric constant of ALD thin films deposited onto the lumped element superconducting resonator can be evaluated by this method. At low temperature, ALD thin films deviate from the two-level fluctuation (TLF) somehow.

**Impact**

This method gives us the simple evaluation of electrical properties of thin films at microwave frequencies and the estimation of fundamental properties for superconducting qubit circuits.

Contact: Yuichi Harada yharada@will.brl.ntt.co.jp