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Front-line Researchers

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▼Overview

Japan is a so-called *super-aging society*, with people aged 65 and older accounting for over 25% of its population. The needs for early detection of diseases and care for elderly people living alone at home are increasing, and it is urgently needed to establish high-precision measurement of biological signals and a platform for processing biological information. In the meantime, society is rapidly globalizing. We asked NTT Fellow Shingo Tsukada of NTT Basic Research Laboratories what kind of stance researchers should take as they tackle research in such an era.

NTT Technology Report for Smart World

Technology Report for Smart World

▼Abstract

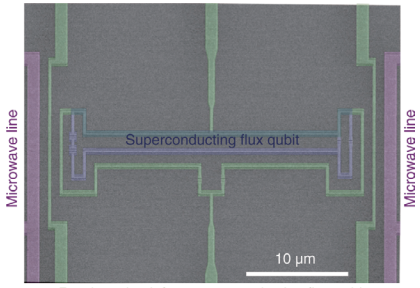
NTT Research and Development Planning Department has selected 11 key technologies for realizing a smart world based on social trends for the next 7 to 10 years and published “NTT Technology Report for Smart World.” This article introduces a summary of these 11 technologies and the social changes that will be brought about by such technologies.

Regular Articles

Electron Spin Resonance Spectroscopy Using a Superconducting Flux Qubit

▼Abstract

We use a superconducting flux qubit for the sensing application of electron spin resonance (ESR) spectroscopy. The superconducting flux qubit is a highly sensitive magnetometer with micrometer-scale spatial resolution. The sensitivity of our spectrometer is 400 spins/$\sqrt{\ }$Hz, and the sensing volume is 0.05 pL. This high sensitivity and high spatial resolution enable us to investigate a small number of electron spins in a microscale area. The spectrometer also obtains a wider ESR spectrum range with two-parameter (frequency and magnetic field) scanning. This enables us to refine the material parameters.



Readout circuit for a superconducting flux qubit
(Connected to room temperature electronics)