Project Title:

Quantum electrodynamics in microwave regime in superconducting electrical circuits

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I would like to use the RICC cluster for quantum dynamics calculations and for calculating properties of cavity-QED and transmission-line-QED systems based on superconducting circuits with Josephson junctions. Such systems are recently receiving increasing attention for their potential to implement quantum optics like experiments in controlled and engineered electrical circuits. In particular, I would like to calculate the spectral properties of single-artificial-atom lasers and parametrically driven cavity-QED systems that recently have been implemented experimentally by other groups in Japan and abroad.

This is a continuation of the project from the previous fiscal year. No numerical calculations has yet been made using the RICC for this project. This is due to an incompatibility with our existing code with the RICC system. We are working on fixing this problem, and as soon as the simulation has been ported to the RICC we will start the calculations and use our allocated CPU hours. This is the reason for why my Quick user account has not been used yet (for computations, but the development of the simulation software and test runs is ongoing).