

Joint CQSE & NCTS Special Seminar

2024
Dec. 12, Thursday

Time: Dec. 12, 10:30-11:30

Title: 3D stacked spin qubit and TCAD simulations

Speaker: Prof. Tetsufumi Tanamoto (Department of information and science, Teikyo University)

Place: NCTS Physics Lecture Hall, 4F, Chee-Chun Leung Cosmology Hall, NTU

Online Link: [2024/12/12 Joint CQSE & NCTS Special Seminar](https://nationaltaiwanuniversity-zbh.my.webex.com/nationaltaiwanuniversity-zbh.my/j.php?MTID=mc2b6964585634ced4f05c3bc2742402e)

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Thursday, December 12, 2024 10:30 AM | 1 hour | (UTC+08:00) Taipei

Abstract:

Spin qubit systems are one of the promising candidates for Si based quantum computing. The conventional spin-qubit cell consists of control and readout units around a quantum dot (QD) in which excess electron works as spin qubit. Therefore, the integration of qubits is difficult because of many wires, and extra mechanism such as shuttling parts are required. We have proposed a new structure of stacked qubits, in which the gate-all-around (GAA) channel plays the role of both the control and readout¹, and the integration of qubits is feasible by extending the commercial silicon technologies. The qubit-QDs are placed in the gate insulator between the channel region and the gate electrodes like floating gates. Here, we show TCAD simulations to show how the extra electric charges in the QD affects the channel current.

Biography:

Tetsufumi Tanamoto received the B.S. degree in Physics from Kyoto University, Kyoto, Japan, in 1988. He received the M.S. and Ph.D. degree from The University of Tokyo, Tokyo, Japan, in 1990, and 1995, respectively. In 1991, he was with the R&D Center, Toshiba Corporation, Kawasaki, Japan. Since 2019, he has been the professor of graduate School of Science & Engineering, Teikyo University, Japan. His recent interests include the science and the technologies of quantum computing and CMOS circuits.

