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学会名	11TH WORKSHOP ON SEMICONDUCTOR/SUPERCONDUCTOR QUANTUM COHERENCE EFFECT AND QUANTUM INFORMATION
演題名	(Invited) Theoretical study on spin qubit integration based on conventional transistors
発表者	<u>T. Tanamoto</u>
内容	<p>The sizes of commercial transistors are of nanometer order, and there have already been many proposals of spin qubits using conventional complementary metal-oxide-semiconductor transistors. However, most of the previously proposed spin qubits require many wires to control a small number of qubits. This causes a significant “jungle of wires” problem when the qubits are integrated into a chip. Herein, to reduce the complicated wiring, we theoretically consider spin qubits embedded into fin field-effect transistor (FinFET) devices such that the spin qubits share the common gate electrode of the FinFET. The interactions between qubits occur via the Ruderman-Kittel-Kasuya-Yosida interaction via the channel of the FinFET. The possibility of a quantum annealing machine is discussed in addition to the quantum computers of the current proposals.</p> <p>(*)This work was partly supported by MEXT Quantum Leap Flagship Program (MEXT Q-LEAP) Grant No. JPMXS0118069228, Japan.</p>