
	Compact spin qubits using the common gate structure of fin field-effect transistors
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	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. (*)This work was partly supported by MEXT Quantum Leap Flagship Program (MEXT Q-LEAP) Grant No. JPMXS0118069228, Japan.