Impact of single atom on transistor characteristics
- towards single-dopant electronics -

Motivation
For future nano- and quantum-electronics, we are developing technology that enables us to fabricate atom transistors, which operate with a power of a dopant, or a single impurity atom in silicon.

Originality
We fabricated transistors that contain only one dopant (boron atom) and found that the transistor characteristics changed according to the position of the dopant in the transistor channel.

Impact
The present results are significant advance towards realization of making atomic-scale transistors. The integrated circuits composed of such atom transistors would be ultimately small, low power, and highly functional as they can enjoy various atomic properties of the dopant.