

## Motivation

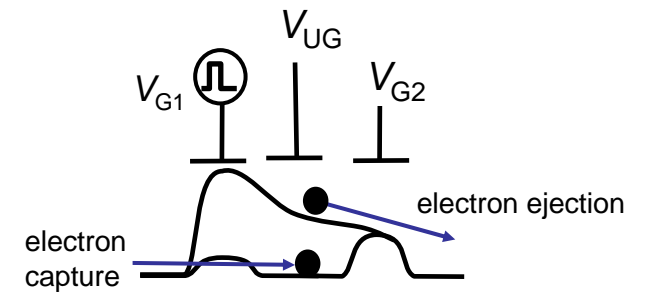
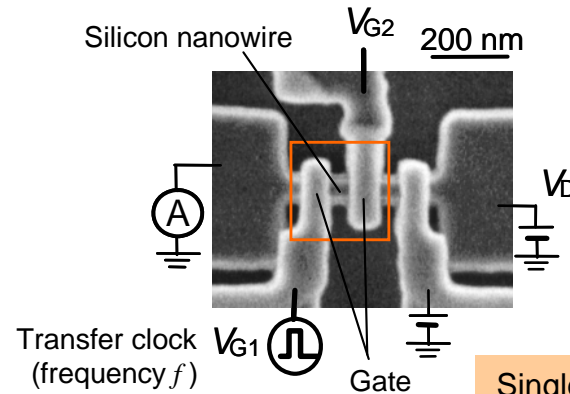
The purpose of this research is to develop the technology for high-speed and high-accuracy single-electron transfer/manipulation.

## Originality

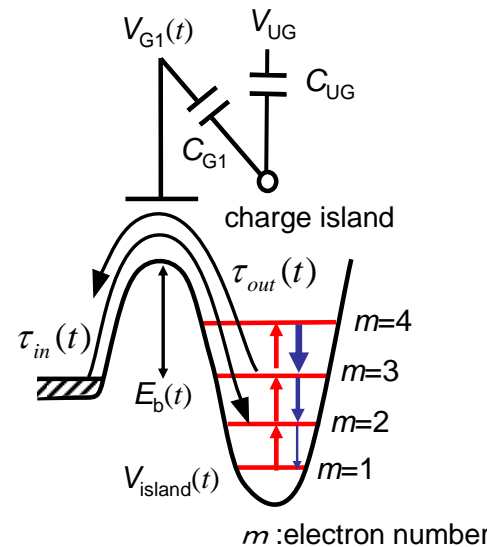
We have so far demonstrated fast single-electron transfer with GHz clock using silicon nanowire MOSFETs. Towards the realization of high-accuracy transfer, we investigate the electron dynamics in the single-electron transfer experimentally and theoretically. It is found that the accuracy can be higher due to the dynamical effect than the thermal-equilibrium limit.

## Impact

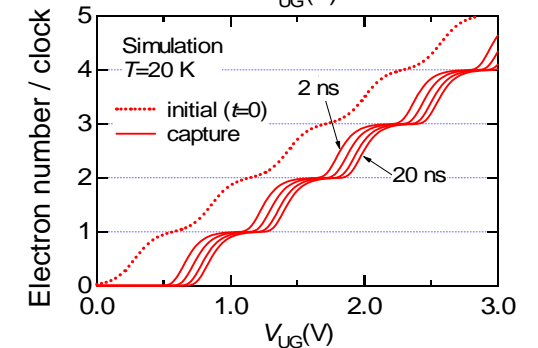
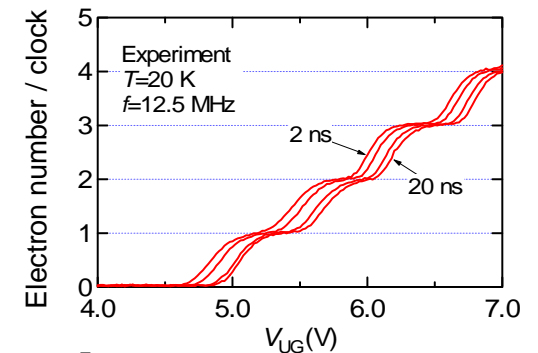
High-accuracy single-electron transfer would be useful for future low-power circuit in which a single electron represents a bit of information. It would be also promising for metrological current standard that is necessary for the so-called metrological triangle experiment of electric standards.



Single-electron transfer device



Single-electron capture model considering time-dependent potential



Single-electron transfer characteristics (clock rise time dependence)

