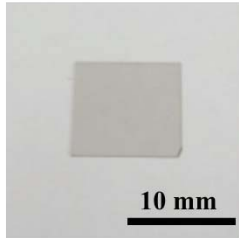
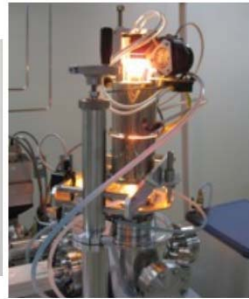


Graphene growth on SiC substrate

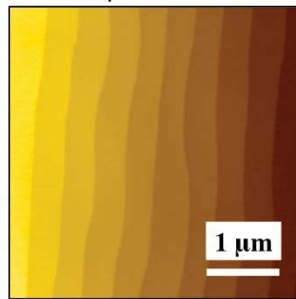
10 mm-sq single-crystal mono-layer graphene sample



Super-RTA for graphene growth

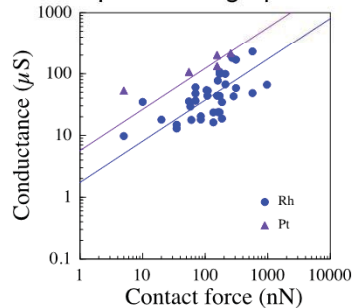


graphene on controlled step structures

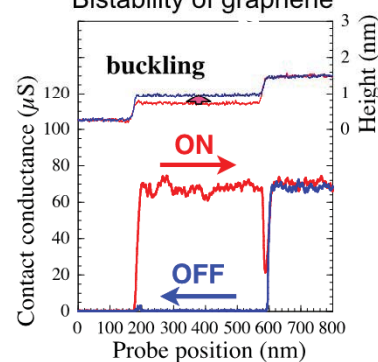


Graphene properties

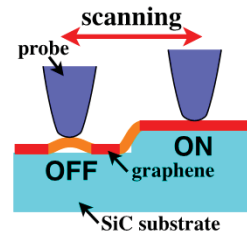
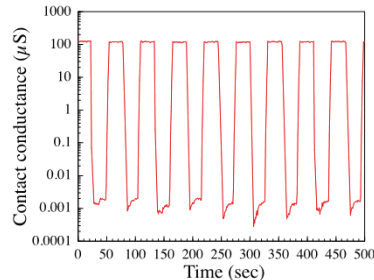
Contact conductance between nanoprobe and graphene



Bistability of graphene



Repeatability of Atomic layer switching



Graphene is very promising for future micro- and nano-electronic systems, because of its outstanding properties. Now, our main research interest is “graphene on SiC”. We can fabricate 10 mm-sq single-crystal mono-layer graphene using super-RTA (rapid thermal annealer). The high-quality and uniform epitaxial graphene was grown on controlled step structures of 4H-SiC (0001) substrate. Graphene properties were evaluated using various kinds of nano-metrology tools. By using scanning probe microscopy (SPM), contact conductance between nanoprobe and graphene was measured. The contact resistance value was estimated to be the order of $10^{-9} \Omega \text{ cm}^2$. The novel phenomena of graphene nanomembrane with bistable contact conductance states was observed. This electro-mechanical bistability of atomic layer switch could represent a new path to nano-electro-mechanical systems. A final goal of our graphene research will be new functional devices for the post-Si era.

Keywords: graphene, SiC, nano-metrology

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