

Abstract Submitted  
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**Fabrication of graphene nanoribbon by local anodic oxidation lithography using atomic force microscope** SATORU MASUBUCHI, MASASHI ONO, KENJI YOSHIDA, KAZUHIKO HIRAKAWA, TOMOKI MACHIDA, Institute of Industrial Science and INQIE, University of Tokyo, Japan — We conducted local anodic oxidation (LAO) lithography in single-layer, bilayer, and multilayer graphene using tapping-mode atomic force microscope (AFM). We found that the width of the insulating oxidized area depends systematically on the number of graphene layers. An 800-nm-wide bar-shaped device fabricated in single-layer graphene exhibits the half-integer quantum Hall effect, which indicates that the conducting channel region of graphene is intact during LAO. We also fabricated a 55-nm-wide graphene nanoribbon (GNR). The conductance of the GNR at the charge neutrality point was suppressed at low temperature, which suggests the opening of an energy gap due to the lateral confinement of charge carriers. These results show that LAO lithography is an effective technique for the fabrication of graphene nanodevices.

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