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Magnetism of Graphene Nanoribbons on Ni(111) KEISUKE SAWADA, FUMIYUKI ISHII, MINEO SAITO, Kanazawa University — The magnetic ground state of zigzag-edge graphene nanoribbon (ZGNR) has an antiferromagnetic (AFM) structure with anti-parallel ferromagnetic (FM) chains at both edges. Recently, we found that the FM and noncollinear magnetic states can be achieved by carrier doping [1]. In this study, we clarify that the FM state also appears in the case of ZGNRs on Ni(111) by using first-principles calculations. We find that the magnetic moment of the edge C atom in the mono ZGNR on Ni(111) layer is very small due to the hybridization between electron of the ZGNR and d electron of the first Ni layer. On the other hand, in the case of the bilayer ZGNR on Ni(111), the magnetic moment of the edge C atom at the top layer maintains and the FM state is the ground state. So the bilayer structure is favorable from the viewpoint of spintronics application.

[1] K. Sawada et al., Nano Lett. 9, 269 (2009).

Keisuke Sawada
Kanazawa University

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