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Quantum Monte Carlo study of magnetic impurity in bilayer grephene J.H. SUN, Department of Physics, The Chinese University of Hong Kong, F.M. HU, COMP/Department of Applied Physics, Aalto University, School of Science and Technology, H.K. TANG, HAI-QING LIN, Department of Physics, The Chinese University of Hong Kong — It is expected to observe many different properties in bilayer graphene when compared with single layer graphene due to the differences in crystal structure. Additionally, bilayer system offers a freedom of inducing a gap in the energy band by applying a shift in the electrochemical potential to two graphene layers. In this work, we study the magnetic properties of an Anderson magnetic adatom in Bernal stacking bilayer graphene and compare the results with those of single layer counterpart. Several different cases such as different adatom position and different potential bias of two layers are studied using the quantum Monte Carlo method. In all the cases, we find that the impurity local magnetic moment can be switched between relatively large and small values by tuning the chemical potential. We apply MaxEnT method to compute impurity spectral density and find its behavior to differ from that of an impurity in a single layer graphene. We also calculate various correlation functions and make comparisons.

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