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Tunable magnetic order in bilayer graphene JIN-HUA SUN, DONG-HUI XU, YI ZHOU, Department of Physics, Zhejiang University, Hangzhou 310027, P. R. China, FU-CHUN ZHANG, Department of Physics, and Center of Theoretical and Computational Physics, The University of Hong Kong, Hong Kong, China — Layered antiferromagnetic spin density wave (LAF) state is one of the plausible ground state of charge neutral Bernal stacked bilayer graphene. Additionally, bilayer system offers a freedom of inducing a shift in the electrochemical potential to two graphene layers, which is proposed to induce half-metallicity into the system. In this talk, we will report the theoretical results on the effect of the electric field on the magnetic order in bilayer graphene by using mean-field theory and determinant quantum Monte Carlo method. In neutral bilayer graphene, the ground state has layered antiferromagnetism at weak electric field and undergoes a quantum phase transition to a charge order or possibly different type magnetic ordered states at a high electric field.

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