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Realization of Quantum Anomalous Hall Effect in Graphene from n-p Codoping Induced Stable Atomic-Adsorption XINZHOU DENG, ICQD and Department of Physics, University of Science and Technology of China, China, SHIFEI QI, School of Chemistry and Materials Science, Shanxi Normal University, China, YULEI HAN, KUNHUA ZHANG, ICQD and Department of Physics, University of Science and Technology of China, China, XIAOHONG XU, School of Chemistry and Materials Science, Shanxi Normal University, China, ZHENHUA QIAO, ICQD and Department of Physics, University of Science and Technology of China, China — Using first-principles calculation methods, we study the possibility of realizing quantum anomalous Hall effect in graphene from stable 3d-atomic adsorption via charge-compensated n-p codoping scheme. As concrete examples, we show that long-range ferromagnetism can be established by codoping 3d transition metal and boron atoms, but only the Ni codopants can open up a global bulk gap to harbour the quantum anomalous Hall effect. Our estimated ferromagnetic Curie transition temperature can reach over 10 Kelvin for various codoping concentrations.

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