Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Room temperature magnetism on the zigzag edges of phosphorene nanoribbons GUANG YANG, Beijing Normal Univ, SHENGLONG XU, University of California, San Diego,, WEI ZHANG, TIANXING MA, Beijing Normal Univ, CONGJUN WU, University of California, San Diego,, TIANXING MA TEAM, CONGJUN WU TEAM — Phosphorene, as a promising candidate of the post-graphene, has been synthesized recently. it is a monolayer black phosphorus with a puckered honeycomb lattice structure possessing a limit band gap and high carrier mobility. In our recent article, we employ the non-perturbative numeric methods of large-scale quantum Monte-Carlo (QMC) simulations, determinant quantum Monte-Carlo and the ground state constrained path quantum Monte-Carlo simulations repectively, to investigate the edge magnetism in the bulk insulating phosphorene nanoribbons. We find that relatively weak interactions can lead to remarkable edge magnetism in the phosphorene nanoribbons. Strong ferromagnetic correlations along the zigzag edges are revealed by the ground state constrained path quantum Monte-Carlo simulations, and a high Curie temperature up to room temperature is shown by the limit temperature determinant quantum MonteCarlo calculations .

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Date submitted: 27 Oct 2016 Electronic form version 1.4