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Effective Hubbard model for Helium atoms adsorbed on a graphite YUICHI MOTOYAMA, The Institute for Solid State Physics, The University of Tokyo, AKIKO MASAKI-KATO, RIKEN, NAOKI KAWASHIMA, The Institute for Solid State Physics, The University of Tokyo — Helium atoms adsorbed on a graphite is a two-dimensional strongly correlated quantum system and it has been an attractive subject of research for a long time. A helium atom feels Lennard-Jones like potential (Aziz potential [1]) from another one and corrugated potential from the graphite [2]. Therefore, this system may be described by a hardcore Bose Hubbard model with the nearest neighbor repulsion on the triangular lattice, which is the dual lattice of the honeycomb lattice formed by carbons. A Hubbard model is easier to simulate than the original problem in continuous space, but we need to know the model parameters of the effective model, hopping constant t and interaction V. In this presentation, we will present an estimation of the model parameters from ab initio quantum Monte Carlo calculation in continuous space in addition to results of quantum Monte Carlo simulation for an obtained discrete model. [1] R. A. Aziz, V. P. S. Nain, J. S. Carley, W. L. Taylor and G. T. McConville, J. Chem. Phys. 70, 4330 (1979). [2] W. E. Carlos and M. W. Cole, Surf. Sci. 91, 339 (1980).

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