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Magnetic Properties of Low-Energy Effective Model for Iron-Based Superconductor LaFeAsO TAKAHIRO MISAWA, Dept. of Applied Physics, Univ. of Tokyo, MASATOSHI IMADA — Recently discovered iron-based superconductors [1] have attracted much interest, not only in their high superconducting critical temperatures but also in variety of their magnetic properties. In particular, typical iron-based superconductor LaFeAsO has small magnetic ordered moment and its origin is still under hot debates. To clarify the origin of small magnetic ordered moment, we study the effective low-energy model for LaFeAsO derived from the downfolding scheme based on the first-principles calculations [2] by using variational Monte Carlo (VMC) method [3]. By combining with quantum-number projection method, our VMC method offers an efficient way of computation for strongly correlated electron systems [3]. We show that quantum fluctuations beyond the mean-field approximations reduce the magnetic moment dramatically, and this low-energy model can quantitatively reproduce the small ordered moment of LaFeAsO. Furthermore, we find that iron-based superconductors are located in largely orbital fluctuating region, which is sandwiched by the antiferromagnetic Mott insulators and weak correlated metals. [1] Y. Kamihara *et al.*: J. Am. Chem. Soc. **130** (2008) 3296. [2] K. Nakamura *et al.*; J. Phys. Soc. Jpn. **77** (2008) 093711. [3] D. Tahara and M. Imada: J. Phys. Soc. Jpn. **77** (2008) 093703;D. Tahara and M. Imada: J. Phys. Soc. Jpn. **77** (2008) 114701.

Takahiro Misawa
Dept. of Applied Physics, Univ. of Tokyo

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