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Testing The Constrained-Path Quantum Monte Carlo Method Using A One Dimensional Three Orbital Hubbard Model. GUANGKUN LIU, Univ of Tennessee, Knoxville and Beijing Normal University, NITIN KAUSHAL, Univ of Tennessee, Knoxville, CHRIS BISHOP, SHUHUA LIANG, Univ of Tennessee, Knoxville and ORNL, SHAOZHI LI, STEVE JOHNSTON, Univ of Tennessee, Knoxville, ELBIO DAGOTTO, Univ of Tennessee, Knoxville and ORNL — The "sign problem" usually prevents the large scale quantum Monte Carlo simulations of the multi-orbital Hubbard models. Projecting from a variety of initial states constructed via the Hartree-Fock technique, a constrained-path quantum Monte Carlo [1] (CPQMC) simulation has been carried out for the full one-dimensional three-orbital Hubbard model [2] and also for the same model but neglecting the pair-hopping and spin-flip interactions. The corresponding phase diagrams varying electronic density n and Hubbard U are constructed. Extensive comparisons with density matrix renormalization group and determinant quantum Monte Carlo results demonstrate that CPQMC is capable of capturing the physics of the orbital-selective Mott phase [2,3]. Our results also suggest that the spin-flip and pair-hopping interactions only have a limited effect on multi-orbital Hubbard model phase diagrams. [1] Guangkun Liu, Zhongbing Huang, and Yongjun Wang, J. Phys.: Condens. Matter 26, 325601(2014) [2] Julian Rincon, Adriana Moreo, Gonzalo Alvarez, and Elbio Dagotto, Phys. Rev. Lett. 112 106405 (2014) [3] Julian Rincon, Adriana Moreo, Gonzalo Alvarez, and Elbio Dagotto, Phys. Rev. B 90 241105(R)(2014)

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