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Correlation driven dimensional reduction in a two orbital Hubbard model ANAMITRA MUKHERJEE, University of Tennessee, Knoxville, Tennessee 37996, USA. National Institute of Science Education and Research, India, NIRAVKUMAR D. PATEL, ADRIANNA MOREO, ELBIO DAGOTTO, University of Tennessee, Knoxville, Tennessee 37996, USA — We apply a recently developed many-body technique that allows for the incorporation of thermal effects, to a two orbital Hubbard model of relevance for the pnictides. In this Mean Field-Monte Carlo (MF-MC) approach, we first perform a mean field (MF) decomposition of the Hubbard model and then treat the mean field parameters via the standard finite-temperature classical Monte Carlo (MC). We have earlier established [1] that for the one orbital Hubbard model, this MF-MC approach provides remarkable improvement over simple finite-temperature mean field methods and is in good agreement with Determinantal Quantum Monte Carlo results. In this talk we will discuss our MC-MF results applied to the two orbital Hubbard model with degenerate dxz and dyz orbitals for the undoped pnictides [2]. The onsite repulsion strength U vs. temperature phase diagram is rich and has a narrow window of nematicity above the Neel temperature. Our main result is the discovery of a novel intermediate coupling regime characterized by an unexpected spontaneous dimensional reduction that renders one direction insulating and the other metallic. [1] A. Mukherjee, et. al. Phys. Rev. **B** 90, 205133 (2014). [2] A. Mukherjee, et. al. arXiv:1510.04902

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