

Abstract Submitted  
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**Composite Quantum phases in a system of tilted dipolar lattice bosons** AKBAR JAHANGIRI-JOZANI, CHAO ZHANG, Homer L. Dodge Department of Physics and Astronomy, The University of Oklahoma, Norman, Oklahoma, 73019, USA, ARGHAVAN SAFAVI-NAINI, JILA , NIST and Department of Physics, University of Colorado, 440 UCB, Boulder, CO 80309, USA, BARBARA CAPOGROSSO-SANSONE, Homer L. Dodge Department of Physics and Astronomy, The University of Oklahoma, Norman, Oklahoma, 73019, USA — Dipolar lattice bosons allow for the realization of novel quantum phases due to the long-range nature of the interaction and its inherent anisotropy. We utilize Path Integral Quantum Monte Carlo simulations, using a novel multi-worm extension to the Worm algorithm, to explore the phase diagram of hard-core dipolar bosons in a two-dimensional optical lattice as a function of the tilting angle. This setup allows for the formation of dipolar chains which can form a variety of composite insulating and superfluid phases.

Akbar Jahangiri-Jozani  
Homer L. Dodge Department of Physics and Astronomy,  
The University of Oklahoma, Norman, Oklahoma, 73019, USA

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