

Abstract Submitted
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Realizing the Strongly Correlated d -Wave Mott-Insulator State in a Fermionic Cold-Atom Optical Lattice¹ MICHAEL PETERSON, CHUANWEI ZHANG, SUMANTA TEWARI, SANKAR DAS SARMA, University of Maryland — We show that a new state of matter, the d -wave Mott-insulator state (d -Mott state) (introduced recently by [H. Yao, W. F. Tsai, and S. A. Kivelson, Phys. Rev. B 76, 161104 (2007)]), which is characterized by a nonzero expectation value of a local plaquette operator embedded in an insulating state, can be engineered using ultracold atomic fermions in two-dimensional double-well optical lattices. We characterize and analyze the parameter regime where the d -Mott state is stable. We predict the testable signatures of the state in the time-of-flight measurements.

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