

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Spin-orbital models using dipolar fermions in zig-zag optical lattices¹ TEIMURAZ VEKUA, GAOYOUNG SUN, GEORGE JACKELI, LUIS SANTOS, none — Ultra-cold dipolar spinor fermions in zig-zag type optical lattices can mimic spin-orbital models relevant in solid-state systems, as pyroxene titanium and layered vanadium oxides, with the interesting advantage of reviving the quantum nature of orbital fluctuations. We discuss two different physical systems in which these models may be simulated, showing that the interplay between lattice geometry and spin and orbital quantum dynamics produces a wealth of novel quantum phases.

¹This work has been supported by QUEST (Center for Quantum Engineering and Space-Time Research). Support from SCOPES Grant IZ73Z0-128058 (T.V.) and GNSF/ST09-447 (G.J.) is acknowledged.

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None

Date submitted: 07 Dec 2011

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