Abstract Submitted
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The Bosonic Kane-Mele Hubbard model RAJBIR NIRWAN[1], Institut fur Theoretische Physik, Goethe-Universitat, 60438 Frankfurt/Main, Germany, IVANA VASIC, Scientific Computing Laboratory, Institute of Physics Belgrade, University of Belgrade, 11080 Belgrade, Serbia, ALEXANDRU PETRESCU, Department of Electrical Engineering, Princeton University, Princeton, New Jersey 08544, USA, KARYN LE HUR, Centre de Physique Theorique, Ecole Polytechnique and CNRS, Universite Paris-Saclay, France, WALTER HOFSTETTER, Institut fur Theoretische Physik, Goethe-Universitat, 60438 Frankfurt/Main, Germany — We investigate the bosonic equivalent of the Kane-Mele model on the honeycomb lattice [1] including spin-orbit and interaction effects. This model is a generalization of the interacting bosonic Haldane model introduced in Ref. [2]. We also allow for an on-site conversion (coherent) term between the two species. We analyze the phase diagram using bosonic dynamical mean-field theory and analytical methods. In the Mott phase, a strong-coupling expansion is performed to investigate the magnetism and frustration effects. A connection is drawn with the quantum theory of an antiferromagnet on a triangular lattice in a magnetic field [3]. This model can be realized in ultra-cold atom systems with current technology. [1] C. L. Kane and E. Mele, Phys. Rev. Lett. 95, 226801 (2005). [2] I. Vasic, A. Petrescu, K. Le Hur and W. Hofstetter, Phys. Rev. B 91, 094502 (2015). [3] A. V. Chubukov and D. I. Golosov, J. Phys. Cond. Matt. 3 69 (1991).

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