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Bosons on the Kagome lattice with artificial gauge fields ALEXANDRU PETRESCU, Yale University and Center For Theoretical Physics (CPHT), Ecole Polytechnique, S.M. GIRVIN, Yale University, KARYN LE HUR, Center For Theoretical Physics (CPHT), Ecole Polytechnique and CNRS, 91128 Palaiseau France — We investigate bosons on the Kagome lattice subject to artificial gauge fields such that no net flux is applied on a unit cell [1]. This allows for example the existence of quantized and non-quantized anomalous Hall effects on the Kagome lattice [2]. If two layers or two-component bosons are introduced, the topological phase is robust to inter-species interactions of moderate strength. We study the conditions under which the total density degree of freedom undergoes a Mott transition, while the pseudo-spin, or charge difference between layers, is in a superfluid phase with topological properties. Similar results can be obtained for two-component bosons on the honeycomb lattice. Such systems could work as a template for the realization of interacting topological phases in cold atom or cavity QED systems.

[1] Jens Koch, Andrew A. Houck, Karyn Le Hur, and S. M. Girvin, Phys. Rev. A 82, 043811 (2010).

[2] Alexandru Petrescu, Andrew A. Houck and Karyn Le Hur, Phys. Rev. A 86, 053804 (2012).

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