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**Phase diagram of an easy-axis Kagome antiferromagnet under a magnetic field** XAVIER PLAT, FABIEN ALET, SYLVAIN CAPPONI, PIERRE PUJOL, Laboratoire de Physique Théorique, Université Paul Sabatier, Toulouse, KEISUKE TOTSUKA, Yukawa Institute for Theoretical Physics, Kyoto University — We present a quantum Monte-Carlo (QMC) study of a spin-1/2 XXZ model, with second and third-neighbour terms, under a magnetic field on the Kagome lattice. This model, introduced in the zero field case by Balents, Fisher and Girvin [1], exhibits, in the easy-axis limit, a topological gapped Z<sub>2</sub> phase with fractional excitation [2-4]. When adding a magnetic field, other gapped incompressible phases are stable for magnetizations 1/3 and 2/3 of its saturation value. Using state-of-the-art measurements, including recently developed tools to compute the topological entropy, we investigate the nature of these ground-states. Finally, we make some connection between these microscopic models and effective constrained models (such as quantum loop model or quantum dimer model respectively), which allow to provide a better understanding of the physical properties.

- [1] L. Balents, M. P. A. Fisher, and S. M. Girvin, Phys. Rev. B **65**, 224412
- [2] S. V. Isakov, Y. B. Kim, and A. Paramekanti, Phys. Rev. Lett. **97**, 207204 (2006)
- [3] S. V. Isakov, M. B. Hastings, and R. G. Melko, Nat. Phys. **7**, 772 (2011)
- [4] S. V. Isakov, R. G. Melko, and M. B. Hastings, Science **335**, 193 (2012)

Xavier Plat  
Laboratoire de Physique Théorique, Université Paul Sabatier, Toulouse

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