

amplitude of the orbital magnetization.

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- [1] D. R. Hofstadter, Phys. Rev. B **14**, 2239 (1976); G. H. Wannier, Phys. Status Solidi B **88**, 757 (1978); G. H. Wannier, G. M. Obermair, and R. Ray, Phys. Status Solidi B **93**, 337 (1979).
 - [2] F. H. Claro and G. H. Wannier, Phys. Rev. B **19**, 6068 (1979).
 - [3] R. Rammal, J. Phys. (Paris) **46**, 1345 (1985).
 - [4] Y. Xiao, V. Pelletier, P. M. Chaikin, and D. A. Huse, Phys. Rev. B **67**, 104505 (2003).
 - [5] M. A. Andrade Neto and P. A. Schulz, Phys. Rev. B **52**, 14093 (1995).
 - [6] H. Aoki, M. Ando, and H. Matsumura, Phys. Rev. B **54**, R17296 (1996).
 - [7] A. Behrooz, M. J. Burns, H. Deckman, D. Levine, B. Whitehead, and P. M. Chaikin, Phys. Rev. Lett. **57**, 368 (1986); K. Springer and D. van Harlingen, Phys. Rev. B **36**, 7273 (1987); H. Schwabe, G. Kasner, and H. Böttger, Phys. Rev. B **56**, 8026 (1997).
 - [8] B. Douçot, W. Wang, B. Pannetier, P. Rammal, A. Varelle, and D. Henry, Phys. Rev. Lett. **57**, 1235 (1986); J. M. Gordon, A. M. Goldman, J. Maps, D. Costello, R. Tiberio, and B. Whitehead, Phys. Rev. Lett. **56**, 2280 (1986); Q. Niu and F. Nori, Phys. Rev. B **39**, 2134 (1989).
 - [9] J. Vidal, R. Mosseri, and B. Douçot, Phys. Rev. Lett. **81**, 5888 (1998).
 - [10] O. Gat and J. E. Avron, Phys. Rev. Lett. **91**, 186801 (2003).
 - [11] O. Gat and J. E. Avron, New J. Phys. **5**, 441 (2003).
 - [12] P. Mohan, F. Nakajima, M. Akabori, J. Motohisa, and T. Fukui, Appl. Phys. Lett. **83**, 689 (2003); P. Mohan, J. Motohisa, and T. Fukui, Appl. Phys. Lett. **84**, 2664 (2004).
 - [13] M. J. Higgins, Y. Xiao, S. Bhattacharya, P. M. Chaikin, S. Sethuraman, R. Bojko, and D. Spencer, Phys. Rev. B **61**, R894 (2000); Y. Xiao, D. A. Huse, P. M. Chaikin, M. J. Higgins, S. Bhattacharya, and D. Spencer, *ibid.* **65**, 214503 (2002).