Abstract Submitted
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Dynamical detection of topology with ultracold Fermi gases[1] CHENGDONG HE, ZEJIAN REN, ENTONG ZHAO, ELNUR HAJIYEV, TOBY TING HIN MAK, GYU BOONG JO, Hong Kong University of Science and Technology — Ultracold atoms offer a versatile platform for the experimental study of synthetic topological matter. Owing to maneuverability in a cold atomic system, topological properties have recently been investigated from in-equilibrium quench dynamics. Here, we present our implementation of dynamical detection of band topology in 2D. In the previous work [**?**], the spin dynamics has been monitored in an optical Raman lattice after the quench between topologically trivial and nontrivial regimes, which indirectly reflects the band topology. We extend the detection technique by dynamically controlling the phase of the Raman potential that induces spin-orbit couplings in the lattice. We demonstrate that topological charges can be obtained from time-averaged spin textures after a series of sequential quench processes. This method can be generalized to all dimensions.

References

[1] B. Song, C. He, S. Niu, L. Zhang, Z. Ren, X.-J. Liu, and G.-B. Jo, Nature Physics 15, 911 (2019).

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Chengdong HE
Hong Kong University of Science and Technology

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