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【144】 Coupled chain construction for a fractional spin quantum Hall effect

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While the topological classification of non-interacting spin excitation band structures has successfully been applied to understand many magnetic insulators, intrinsic magnon-magnon interactions can modify the topological properties significantly. Using a coupled wire approach, we show that the system of weakly coupled spin chains with modulated Dzyaloshinskii-Moriya coupling strengths can be engineered to host Abelian and non-Abelian fractional spin quantum Hall effects controlled by tuning the chain magnetizations. The associated spin fractionalization can be detected through the spin conductance. We argue that these phases can be realized in systems of synthetic spin chains and ultracold atoms.

Theoretical Work

Theory

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