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Bulk-Edge Correspondence in 2+1-Dimensional Abelian Topological Phases EUGENIU PLAMADEALA, University of California Santa Barbara, MENG CHENG, MICHAEL MULLIGAN, Microsoft Station Q, CHETAN NAYAK, JENNIFER CANO, University of California Santa Barbara, JON YARD, Microsoft Station Q — The same bulk two-dimensional topological phase can have multiple distinct, fully-chiral edge phases. We show that this can occur in the integer quantum Hall and Abelian fractional quantum Hall states. We give a general criterion for the existence of multiple distinct chiral edge phases for the same bulk phase and discuss experimental consequences. We show that fermionic systems can have edge phases with only bosonic low-energy excitations and discuss a fermionic generalization of the relation between bulk topological spins and the central charge. The latter follows from our demonstration that every fermionic topological phase can be represented as a bosonic topological phase, together with some number of filled Landau levels. Our analysis shows that every Abelian topological phase can be decomposed into a tensor product of theories associated with prime numbers p in which every quasiparticle has a topological spin that is a p^n-th root of unity for some n.

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