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Distinguishing between edge phases of a bulk quantum Hall state JENNIFER CANO, University of California, Santa Barbara, MENG CHENG, MICHAEL MULLIGAN, Microsoft Station Q, CHETAN NAYAK, Microsoft Station Q and University of California, Santa Barbara, EUGENIU PLAMADEALA, University of California, Santa Barbara, JON YARD, Microsoft Station Q — The same bulk quantum Hall state can have multiple distinct, fully-chiral edge phases. This effect can occur at both integer and fractional quantum Hall states; examples include $\nu=8$ and 12 and the fractions $\nu=8/7,12/11,8/15,16/5$. This raises the question: given a quantum Hall device, how do we know which edge phase it is in? This is especially interesting when one edge phase has gapless fermionic excitations and the other does not. Since no bulk measurement can distinguish the states and their quasiparticles are identical, it is necessary to probe the edge directly. Here we discuss experimental probes that can distinguish between the possible edge phases. In addition, we consider interfaces between two edge phases and the localized zero energy modes that can reside at these interfaces.

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