

## Lecture 14: Quantum Hall effect and edge states

The effect of a flux tube through the center of a ring is described. We show that a gauge transforming which removes the flux tube is equivalent to a modification of the periodic boundary condition. The Laughlin argument for the integer quantum Hall effect is given. The Halperin picture of edge states is explained in some detail, leading to an estimate that corrections to the quantization of the Hall resistance is exponentially small in the sample width.

**Reading:** R. Laughlin, Phys. Rev. B **23**, 5632 (1981).

B. Halperin, Phys. Rev. B **25**, 2185 (1982).