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Quantum Hall effect in carbon nanotubes and curved graphene strips JOSE GONZALEZ, Instituto de Estructura de la Materia (CSIC), Madrid, Spain, ENRICO PERFETTO, CNISM, Università di Roma Tor Vergata, Rome, Italy — We show the development of Landau levels for thick carbon nanotubes in a transverse magnetic field, making use of a long-wavelength description in terms of Dirac fermion fields. For values of the magnetic length smaller than the nanotube radius, quantized longitudinal currents are carried by states localized at the flanks of the nanotube. We find that the Hall conductivity is given by even multiples of $2e^2/h$, and clarify the transition to the typical odd-integer quantization of graphene as the nanotube is unrolled to form a curved strip. We also show that the absence of significant backscattering interactions opens the possibility to observe a robust chiral liquid at the flanks of the nanotube.

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