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Magnetotransport in curved 2DEGs using a real-space numerical technique[1] BOZIDAR NOVAKOVIC, KEVIN MESSER, IRENA KNEZEVIC, University of Wisconsin-Madison — 2D nanostructures with curvature have been a subject of intensive fabrication efforts over the recent years, resulting in structures such as group IV and III-V nanotubes, as well as various flexible electronic and nano-electromechanical systems. Calculating electronic and transport properties of these curved systems is an important prerequisite for their successful application. In this work, we present the calculation of ballistic magnetoconductance and charge density in curved 2DEGs. A real space basis is adopted by solving the Schrödinger equation on a grid that follows the natural parameters of the curved surface. This allows for solving the systems with the most general electronic potentials and curvatures. The magnetic field is included through the Peierls substitution in the translation operators on the surface. Several interesting examples of curved systems with flat contacts, such as a curved quantum cavity and a helix-shaped quantum wire, will be presented.

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