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Strongly anisotropic magnetoresistance due to snake states in open tubular nanostructures CHING HAO CHANG, CARMINE ORTIX, Institute for Theoretical Solid State Physics, IFW Dresden, Helmholtzstr. 20, 01069 Dresden, Germany, CNTQC TEAM — When a charge carrier moves along an interface switching the chirality of trajectory, it curves back and forth to form snake orbits moving along the interface. Snake orbits have first been realized in semiconducting two-dimensional electron gases (2DEGs) with an interface inverting the magnetic field direction, and have been recently manufactured in graphene using a p-n junction. Snake orbits, however, can also form in tubular nanostructures subject to weak homogeneous magnetic fields. In this talk, I will discuss how in open tubes both the location and the number of snake orbits can be controlled by rotating the field direction, which eventually leads to a large anisotropic magnetoresistance (AMR) up to 80 % in the diffusive transport regime. These results offer a promising route for engineering AMR effects in the absence of both magnetism and spin-orbit coupling effect.

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