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Electrostatically defined isolated domain wall in integer quantum Hall regime as precursor for reconfigurable Majorana network[1]
ALEXANDER KAZAKOV, GEORGE SIMION, Purdue University, VALERY KOLKOVSKY, ZBIGNIEW ADAMUS, GRZEGORZ KARCZEWSKI, TOMASZ WOJTOWICZ, Institute of Physics, Polish Academy of Sciences, YULI LYANDA-GELLER, LEONID ROKHINSON, Purdue University — Development of a two-dimensional systems with reconfigurable one-dimensional topological superconductor channels became primary direction in experimental branch of Majorana physics. Such system would allow to probe non-Abelian properties of Majorana quasiparticles and realize the ultimate goal of Majorana research - topological qubit for topologically protected quantum computations. In order to create and exchange Majorana quasiparticles desired system may be spin-full, but fermion doubling should be lifted. These requirements may be fulfilled in domain walls (DW) which are formed during quantum Hall ferromagnet (QHF) transition when two Landau levels with opposite spin polarization become degenerate. We developed a system based on CdMnTe quantum well with engineered placement of Mn ions where exchange interaction and, consequently, QHF transition can be controlled by electrostatic gating [1]. Using electrostatic control of exchange we create conductive channels of DWs which, unlike conventional edge channels, are not chiral and should contain both spin polarizations. We will present results on the formation of isolated DWs of various widths and discuss their transport properties. [1] A. Kazakov, *et al.*, Phys. Rev. B **94**, 075309 (2016).

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