The subject of thesis is a theoretical study of the single electron effects in strongly interacting mesoscopic systems based on quantum Hall effect, where one dimensional edge states play an important role. The non-equilibrium bosonization technique is used to take into account a strong electron-electron interaction in such systems. Namely, we theoretically consider the relaxation of an electron wave packet at the quantum Hall edge at filling factor two, the decay of Coulomb blockade oscillations in single electron transistor based on integer quantum Hall effect, and the last question is devoted to the dephasing in electronic Mach-Zehnder interferometer with filling factor one by a strongly coupled Ohmic contact. The investigation is partially triggered by the recent experiments in mesoscopic physics.

Edvin Idrisov is a postdoctoral researcher in University of Luxembourg. His research project is supported by the Core Junior program of the Fonds National de la Recherche, Luxembourg.The author obtained a PhD diploma in Theoretical physics at University of Geneva, Switzerland.

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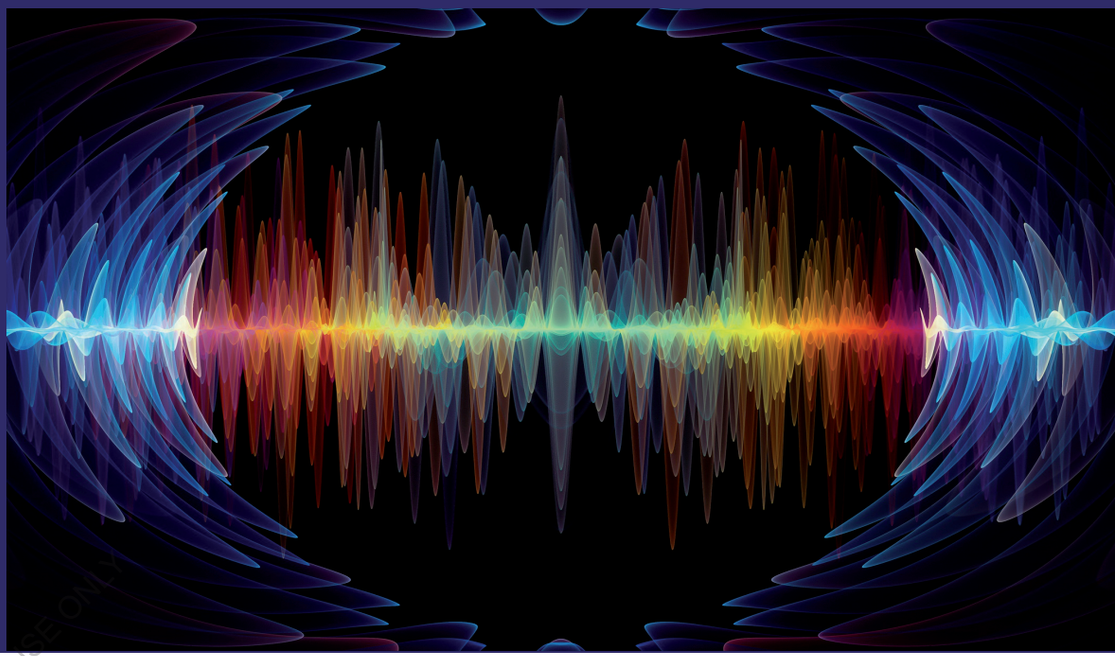

Edvin G. Idrisov

Single electron effects in strongly interacting mesoscopic systems

Non-equilibrium bosonization approach

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