HL 20: Invited Talk Worschech

Time: Tuesday 14:15–15:00 Location: ER 270

Invited Talk HL 20.1 Tue 14:15 ER 270

Y-branched nanojunctions as nanoelectronic logic elements, memory devices and sensors — •Lukas Worschech, David Hartmann, Christian Müller, and Alfred Forchel — Technische Physik, Am Hubland, Universität Würzburg, 97074 Würzburg

In the ballistic nonlinear transport regime, nanoelectronic devices show several electric properties very different from those of diffusive conductors. In branched nanojunctions self-switching, tuneable bistability, rectification and deviations from the Onsager-Casimir symmetry relations can occur, whenever the device dimensions are smaller than the screening length and the mean free path of electrons. We have fabricated Y-branch switches with lengths of a few tens of nanometers by electron beam lithography and etching techniques in GaAs/AlGaAs heterostructures. Exploiting nonlinear ballistic transport in Y-branched nanojunctions compact logic gates, memory devices and noise enhanced sensors were realized. In branched nanojunctions subthermal switching and detection of signals hidden in noise are reported.