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**HL 8: Invited Talk Fischer**

Time: Monday 14:00–14:45

Location: H15

**Invited Talk**

HL 8.1 Mon 14:00 H15

**Coupling phenomena in dual electron waveguide structures**

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A review is given on coupling phenomena between two one-dimensional electron systems (1DES) in dual electron waveguide structures realized as quantum point contacts or short quantum wires. Dual 1DES can be prepared from GaAs/AlGaAs heterostructures hosting high-mobility

two-dimensional electron gases. Today, the merits of nanolithography allow a standard fabrication of 1DES with subband spacings of more than 10 meV. Therefore, high-resolution transport and magnetotransport spectroscopy can be performed which reveals directly the 1D subband structure of each quantum conductor and the energy splittings of mode-coupled levels [1]. Operation at liquid helium temperature and above is demonstrated. Mode coupling between degenerate 1D subbands depends on the symmetry of the confining potential and the coupling strength. Examples will be discussed for spatially coincident and tunnel-coupled vertically stacked dual 1DES [2,3]. [1] S.F. Fischer, *et al.*, Nature Physics **2**, 91-96 (2006). [2] S.F. Fischer, *et al.*, Phys. Rev. B **71**, 195330 (2005). [3] S.F. Fischer, *et al.*, Phys. Rev. B **74**, 115324 (2006).