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**Electron transport in coupled InGaAs quantum wires**[1] VASYL KUNETS, SERGEY PROSANDEEV, SABINA KOUKOURINKOVA, VITALIY DOROGAN, YURIY MAZUR, MARCIO TEODORO, MORGAN WARE, MOURAD BENAMARA, PETER LYTVYN, GREGORY SALAMO, University of Arkansas, Physics Department, Fayetteville, AR 72701 — Remotely doped InGaAs/GaAs heterostructures were grown by molecular beam epitaxy on the (311)A plane of GaAs. Applying strain driven epitaxy on the (311)A GaAs surface, two-dimensional quantum wells (QW) and quasi-one-dimensional quantum wires (QWr) were formed by varying InGaAs coverage between 6 and 11 monolayers. Polarization dependent photoluminescence and electrical conductivity experiments revealed a remarkable anisotropy in the QWr samples, which was insignificant in the QWs, the dimensionality of which was confirmed by atomic force and cross-sectional transmission electron microscopies. The resulting complex behavior of the electric current anisotropy as function of InGaAs coverage, doping and temperature is explained through a multi-band conductivity model, which is supported by magneto-transport measurements at low and high magnetic fields along with the Hall effect theory in anisotropic media with multi-band conduction.

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