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Electrical characterization of InAs/GaAs (110) nanostructures by Conductive Atomic Force Microscopy — ●IGOR BEINIK¹, CHRISTIAN TEICHERT¹, LAURA DÍEZ-MERINO², and PALOMA TEJEDOR² — ¹Institute of Physics, Montanuniversität Leoben, Franz Josef Straße 18, 8700 Leoben, Austria — ²Instituto de Ciencia de Materiales de Madrid, CSIC, C/Sor Juana Inés de la Cruz 3, 28049-Madrid, Spain

Self-assembled InAs quantum dots and wires have been studied over many years and still they are of great interest for application in nano-electronics, high-speed spintronic devices, etc. Samples for our investigation were grown by molecular beam epitaxy on misoriented (110) GaAs substrates. Conductive Atomic Force Microscopy (C-AFM) technique was used to study the surface topography and conductivity simultaneously. Comparison of the corresponding cross-section profiles indicated that InAs nucleation takes place on the [1-10]-oriented step bunches, forming 3 nm-high and up to 70 nm-wide wires of variable length. On the other hand, [1-12]-type steps very rarely appeared to be decorated by InAs, also in agreement with previous TEM studies[1]. The presented results prove that C-AFM technique might be successfully applied as a tool for investigation of electrical properties in III-V quantum dots and wires on the nanometer scale. This work is supported by FWF Project # P19636, ÖAD project # ES 17/2007, TEC2007-66955 and HU2006-0022. [1] X.M. Zhang, D.W. Pashley, I. Kamiya, J.H. Neave, B.A. Joyce, J. Cryst. Growth 147 (1995) 234.

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