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Electronic transport in individual, vertical, catalyst free GaN/AlN nanowires CAMELIA MARGINEAN, SANTINO CARNEVALE, PATRICK PHILLIPS, THOMAS KENT, DENIS PELEKHOV, MICHAEL MILLS, ROBERTO MYERS, The Ohio State University — In the recent years, the advances in the THz technology, for example the development of the quantum cascade laser, promotes the possibility to use resonant tunneling diodes (RTD) to enhance such technologies. Coaxial m-plane AlN/GaN nanowire based resonant tunneling diode structures were formed by plasma assisted molecular beam epitaxy (MBE) using a two-step growth method that allows for control of vertical and lateral growth [1]. They are spontaneously formed MBE nanowires and they are integrated in Si (111). We discuss ongoing work on the electronic transport in these individual, vertical nanowires using two nanoprobe to contact the top of the nanowire and the substrate. The IV characteristics reveal a clear negative differential resistance (NDR) at room temperature (RT). The NDR was observed $\sim 4V$ with a peak-to-valley ratio as high as 10. [1] S.D. Carnevale *et al.*, *Nano Letters*, 11, (2), 2011.

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