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Electronic Transport of TiO_2 Nanowire Devices GEETHA DHOLAKIA, ELORET/NASA Ames Research Center, STEVEN KUO, NASA Ames Research Center, San Jose State University, EMILY ALLEN, Dept. of Materials Engineering, San Jose State University — Titanium dioxide (TiO_2) is a wide band-gap semiconductor with applications in photovoltaics and sensing. Large scale integration of nanowires onto functional devices requires new techniques to manipulate them at the nanoscale. Currently engineering strategies for efficient assembly of nanoscale objects is very limited. Here we report the use of dielectrophoresis to assemble TiO_2 nanowires onto devices. We use a sol-gel template based synthesis of TiO_2 nanowires. The nanowires have typical diameters of 100-150 nm and range in length from 3-10 μm. Devices for two probe and four probe measurements were fabricated by standard lithography. AC dielectrophoresis was used to assemble the TiO_2 nanowires on devices. A dielectrophoretic translational force and a torque aligns the nanowires onto the devices. FIB assisted platinum deposition on the aligned TiO_2 nanowires ensures ohmic contacts. Two probe room temperature I-V measurements show a resistivity of 0.22 Ω-cm, which is comparable to 0.26 Ω-cm for a thin film[1]. Temperature dependent transport measurements are being pursued. We have demonstrated an efficient method of assembling and fabricating nanowire device structures. T. Miyata et. al. Thin Solid Films, **496**, 136 (2006).

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