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Gate Controlled Tuning of Seebeck Coefficient in InAs Nanowires

JOHANNES GOOTH, PHILLIP WU, SOFIA SVENSSON, HEINER LINKE, Lund University — Here we present measurements of the Seebeck Coefficient in InAs nanowires grown by Chemical beam epitaxy. Nanowires were mechanically transferred onto a SiO2 substrate with a global metallic backgate, and Ohmic contacts to a single nanowire were made by standard electron beam lithography techniques. We were able to tune the measured thermovoltage in the nanowire by field effect gating and correlate this behavior with the conductance through the nanowire. Interestingly, large enhancements in the thermoelectric power factor were seen at low temperature for certain gate voltages. Such controllability allows for optimizing the thermoelectric response of the nanowire at different substrate temperatures.

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