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Studies on magnetoresistance and magneto-thermopower of single cobalt nanowire D. KIM, Department of Electrical Engineering, The Pennsylvania State University, J. KALLY, Department of Materials Science and Engineering, The Pennsylvania State University, M.H.W CHAN, N. SAMARTH, Department of Physics, The Pennsylvania State University, D. TADIGADAPA, Department of Electrical Engineering, The Pennsylvania State University — We have studied the magnetoresistance and magneto-thermopower of suspended individual cobalt nanowire using microfabricated thermoelectric workbench. The workbench has embedded heater and thermocouple to provide a temperature gradient along a nanowire and measure temperature of both ends of nanowire. The cobalt nanowire was synthesized by direct electrodeposition and dispersed in solution. It was confirmed that the nanowire is single crystal with hexagonal close-packed structure by TEM analysis. Cobalt nanowires with 70-nm-diameter nanowires were drop-cast on the device and focused-ion-beam-induced deposition of platinum was used to provide mechanical anchors and good electrical and thermal contact between nanowire and the workbench. The magnetic field was applied perpendicular and parallel to wire axis. The absolute value of thermopower increased with perpendicular magnetic field and the value in the saturation state was 0.9 % higher A negative magnetoresistance was observed with 1.3 % smaller resistance in the saturation state. Because of increasing thermopower and decreasing resistance thermoelectric power factor was improved with magnetic field

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