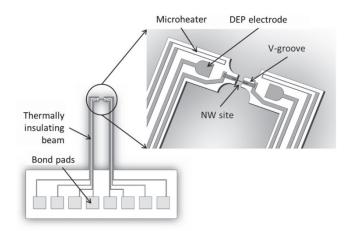
Dielectrophoretic investigation of Bi₂Te₃ nanowires — a microfabricated thermoelectric characterization platform for measuring the thermoelectric and structural properties of single nanowires

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Short Abstract

Here, we present a microfabricated thermoelectric nanowire characterization platform (TNCP) to investigate the thermoelectric and structural properties of single nanowires. By means of Dielectrophoresis (DEP), we introduce a method to manipulate and orient nanowires in a controlled way to assemble them onto our measurement platform. This approach yielded a nanowire assembly of approximately 90% under an applied peak-to-peak ac signal Vpp = 10 V and frequency f = 20 MHz. Chemical composition and crystallographic structure are obtained using transmission electron microscopy. The selected nanowire is observed to be single crystalline over its entire length and no grain boundaries are detected.



Above. TNCP initial design concept. Left: profile of the whole TNCP. Right: detailed view of cantilever tips.