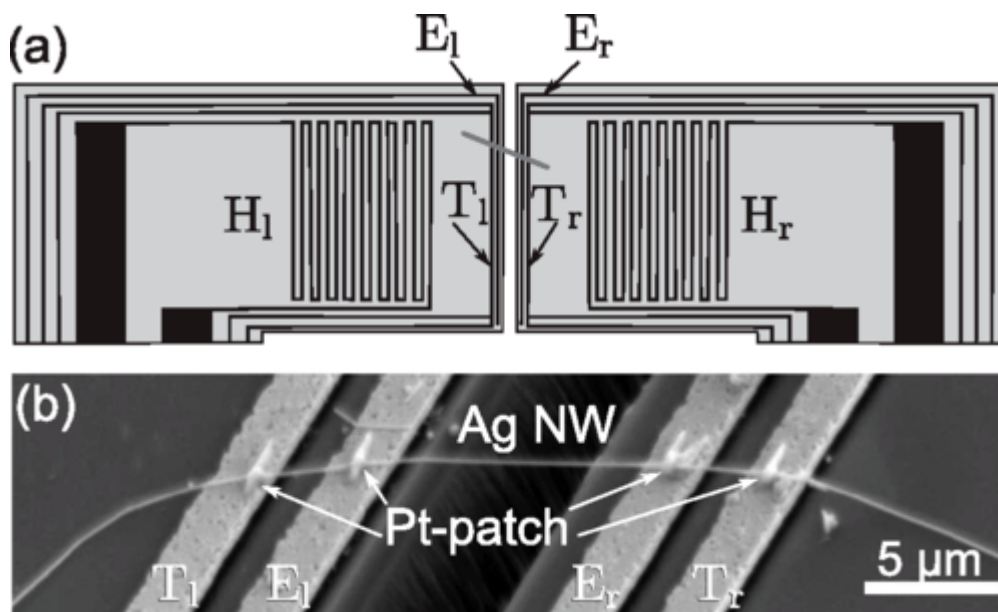


Temperature-dependent thermoelectric properties of individual silver nanowires

D. Kojda, R. Mitdank, M. Handweg, A. Mogilatenko, M. Albrecht, Z. Wang, J. Ruhhammer, M. Kroener, P. Woias, and S. F. Fischer.
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Short Abstract

Individual highly pure single crystalline silver nanowires were investigated regarding electrical conductivity σ , thermal conductivity λ and the Seebeck coefficient S as function of the temperature T . Transmission electron microscopy was performed on the thermoelectric characterization of the silver nanowires in order to correlate their transport properties with the structural data. The thermoelectric properties of the silver nanowires are discussed in comparison to the bulk. An important finding is that the Lorenz number $L(T)$ turns out to be independent of surface scattering and its characteristic is instead determined by the material's purity.



Above. (a) Sketch of the thermoelectric nanowire characterization platform (TNCP) cantilever tips (black: Pt lines, bright gray: SiO_2 , dark grey: NW, white: vacuum). (b) SEM image of a tilted TNCP with an EBID contacted Ag NW (Ag NW3).