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Measurement of Cross-plane Thermoelectric Properties of Thin Film Structures with UHV Scanning Thermoelectric Microscopy YONG LEE, ANASTASSIOS MAVROKEFALOS, MICHAEL PETTES, LI SHI, The University of Texas at Austin — In recent years various thin film structures have been under intense research in the hope for achieving increased thermoelectric figure of merit (ZT) compared to bulk materials. Accurate measurements of three quantities (S : Seebeck coefficient, σ : electrical conductivity, and κ :thermal conductivity) used to calculate ZT have been a challenge especially for thin film structures which may have very different values between in-plane and cross-plane directions due to the anisotropy. Here, we report our progress toward accurately measuring these thermoelectric properties of thin films along the cross-plane direction with a ultrahigh vacuum (UHV) scanning probe microscope. In particular, cross-plane Seebeck coefficient and electrical conductivity measurement of a thin film with a conductive AFM or STM probe will be discussed.

Yong Lee
The University of Texas at Austin

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