

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Seebeck Coefficients in Nanoscale Junctions: Effects of Electron-Vibration Scattering and Local Heating¹ BAILEY C. HSU, Department of Electrophysics, National Chiao Tung University, Taiwan, YU-SHEN LIU, College of Physics and Engineering, Changshu Institute of Technology, China, SHEN HSIEN LIN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan. Department of Applied Chemistry, National Chiao Tung University, Taiwan, YU-CHANG CHEN, Department of Electrophysics, National Chiao Tung University, Taiwan — We report first-principles calculations of inelastic Seebeck coefficients in an aluminum monatomic junction. We compare the elastic and inelastic Seebeck coefficients with and without local heating. In the low temperature regime, the signature of normal modes in the profiles of the inelastic Seebeck effects is salient. The inelastic Seebeck effects are enhanced by the normal modes, and further magnified by local heating. In the high temperature regime, the inelastic Seebeck effects are weakly suppressed due to the quasi-ballistic transport.

¹This work is supported under Grants NSC 97-2112-M-009-011-MY3 and NSFC 10947130.

Bailey C. Hsu
Department of Electrophysics, National Chiao Tung University, Taiwan

Date submitted: 26 Oct 2010

Electronic form version 1.4