Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

High temperature thermoelectric properties of $Bi_2Sr_2Co_2O_y$ thin films grown by Pulsed Laser Deposition WOLTER SIEMONS, UC Berkeley - Dep. of Physics, JAYAKANTH RAVICHANDRAN, UC Berkeley - AS&T graduate group, HERMAN HEIJMERIKX, University of Twente - Dep. of Science and Technology, JOSEPH FESER, ARUN MAJUMDAR, UC Berkeley - Dep. of Mechanical Engineering, R. RAMESH, UC Berkeley - Dep. of Physics — Misfit cobaltates are strongly correlated materials showing exceptional thermoelectric properties. Sodium cobaltate is the model system for this class of materials, which show high thermopower in the limit of large carrier concentration. Even though the exact origin of enhanced thermoelectricity is debatable, there is a general consensus that strong correlation plays a huge role in this effect. In order to better understand the nature of these materials, we chose to investigate $Bi_2Sr_2Co_2O_y$, which is one of the least studied materials in thin film form. We grew c-axis oriented thin films of $Bi_2Sr_2Co_2O_y$ on c-plane sapphire substrates by Pulsed Laser Deposition method. The thermoelectric properties of the films namely thermopower, electrical and thermal conductivities were measured over a temperature range of 300-800 K. Magnetic measurements, Nuclear Magnetic Resonance (NMR) and Electron Spin Resonance (ESR) were performed to determine the valence and spin states of Cobalt and the validity of Heikes formula is checked for this compound.

Wolter Siemons
UC Berkeley - Dep. of Physics

Date submitted: 27 Nov 2009 Electronic form version 1.4