Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Systematic Study of Microwave Absorption, Heating, and Microstructure Evolution of Porous Copper Powder Metal Compacts
DARIN ZIMMERMAN, JOHN DIEHL, EARNIE JOHNSON, KELLY MARTIN, NICHOLAS MISKOVSKY, CHARLES SMITH, GARY WEISEL, BROCK WEISS, The Pennsylvania State University, Altoona College, JUNKUN MA, Southeastern Louisiana University — We present a systematic study[1] of the absorption, heating behavior, and microstructure evolution of porous copper powder metal powder compacts subjected to 2.45 GHz microwave radiation and explain our observations using known physical mechanisms. Using a single mode microwave system, we place the compacts in pure electric (E) or magnetic (H) fields and compare the heating trends. The observed trends in the E- and H-field heating reflect the dramatic changes in the conductivity, permittivity, and permeability of the samples caused by the microstructure evolution during heating in the two types of fields. The observed dependence of the initial microwave heating of the samples suggests that the microwave absorption in the sample is dominated by the properties of the individual metal particles composing the sample.

[1]J. Ma, J. F. Diehl, E. J. Johnson, K. R. Martin, N. M. Miskovsky, C. T. Smith, G. J. Weisel, B. L. Weiss, and D. T. Zimmerman, J. Appl. Phys. **101**, 074906 (2007)

Darin Zimmerman
The Pennsylvania State University, Altoona College

Date submitted: 20 Nov 2007 Electronic form version 1.4