Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Electron lattice coupling in HTSC cuprates: Evidence for polaron formation from unconventional isotope and strain effects ANNETTE BUSSMANN-HOLDER, Max-Planck-Institute for Solid State Research, HUGO KELLER, University of Zurich, ALAN R. BISHOP, Los Alamos National Laboratory, ARNDT SIMON, Max-Planck-Institutee for Solid State Research, ROMAN MICNAS, A. Mickiewicz University Poznan, K.A. MÜLLER, University of Zurich
— Motivated by recent Andreev reflection experiments we use a two- component scenario to study lattice effects on the superconducting transition temperature T_c, the isotope exponent and strain effects in high temperature superconducting copper oxides. We find that the polaronic renormalization of the single particle energies substantially enhances T_c, can explain the strain induced enhancement of T_c and yields the unconventional isotope effect on the London penetration depth λ_L. The lattice distortion which causes these effects is identified as the Q_2-type Jahn-Teller mode.

Annette Bussmann-Holder
Max-Planck-Institute for Solid State Research

Date submitted: 05 Jan 2005 Electronic form version 1.4