

QB03

Inelastic Light Scattering Studies of Overdoped $Y_{1-x}Ca_xBa_2Cu_3O_7$ Film.

J. H. Lin¹, S. M. Weng¹, H. L. Liu¹, P. C. Chung², and J. -Y. Lin²

¹Department of Physics, National Taiwan Normal University, Taipei 116, Taiwan

²Institute of Physics, National Chiao Tung University, Hsinchu 300, Taiwan.

*Corresponding author: hliu@phy.ntnu.edu.tw, Phone: +886-2-29343163, Fax: +886-2-29326408

The vibrational and magnetic Raman excitation spectra were examined in overdoped $Y_{1-x}Ca_xBa_2Cu_3O_7$ films. Below T_c , certain phonons in undoped $YBa_2Cu_3O_7$ (YBCO) show strong self-energy effects, which gradually vanish with increasing Ca concentration into the overdoped regime. The observed B_{1g} symmetry two-magnon excitation peak near 2900 cm^{-1} in YBCO is significantly broadened, weakened, and shifts to the lower frequency with increasing Ca content, indicating the effective value of magnetic superexchange energy decreases and that the life time of the magnons becomes shorter with increasing hole concentrations.

QB04

Optical Studies of Weak-ferromagnetic Superconductors $RuSr_2RCu_2O_8$ (R = Nd, Sm, Eu, and Gd)

L. Y. Kuo^{*1}, H. L. Liu¹, and H. C. Ku²

¹Department of Physics, National Taiwan Normal University, Taipei 116, Taiwan

²Department of Physics, National Tsing Hua University, Hsinchu 300, Taiwan

*Corresponding author: esgking1983@gmail.com, Phone: +886 2 2933 1075, Fax: +886 2 2932 6408

The results of Raman-scattering and infrared reflectivity measurements of $RuSr_2RCu_2O_8$ (R = Nd, Sm, Eu, and Gd) are presented. These materials are interesting on account of the coexistence of ferromagnetism and superconductivity. At room temperature, several Raman-active phonons are observed and their symmetries identified. The optical constants are estimated by Kramers-Kronig analysis and classical dispersion theory. The temperature dependence of the electronic structures and lattice dynamics of these samples will be discussed.

REFERENCES

- [1] Chmaissem *et al.*, Phys. Rev. B **61**, 6401 (2000).
- [2] M. N. Iliev *et al.*, Physica C **341-348** 2209 (2000).
- [3] F. Wooten, Optical properties of Solids, Academic, New York (1972).
- [4] A. P. Litvinchuk *et al.*, Phys. Rev. B **62**, 9709 (2000).