

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Infrared optical absorption spectra of CuO single crystals:  
Fermion-spinon band and dimensional crossover of the antiferromagnetic  
order** E.J. CHOI, JOOYEON KIM, University of Seoul, Y. SEIKO, T. KIMURA,  
Osaka University, Japan, J. LORENZANA, Università di Roma — We have ob-  
tained mid-infrared optical absorption spectra of the  $S = 1/2$  quasi one-dimensional  
CuO using polarized transmission measurement and interpreted the spectra in terms  
of phonon assisted magnetic excitations. When the electric field is parallel to the  
main antiferromagnetic direction a  $\Delta$  shaped peak is observed with the maximum  
at  $\omega = 0.23$  eV which is attributed to spinons along Cu-O chains. At low tempera-  
tures in the antiferromagnetic phase another peak appears at  $\omega = 0.16$  eV which is  
attributed to two-magnon absorption but the spinon peak remains. This behavior  
is interpreted as due to a dimensional crossover where the low temperature three-  
dimensional magnetic phase keeps short range characteristics of a one- dimensional  
magnet.

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Date submitted: 15 Dec 2010

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