

Abstract Submitted
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**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 Δ 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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