Magnon-phonon interaction in $(VO)_2P_2O_7$ studied by Raman scattering

U. Kuhlmann and C. Thomsen[a]

A.V. Prokofiev, F. Büllesfeld, E. Uhrig, M. Anton, C. Gross and W. Assmus[b]

[a]Institut für Festkörperphysik, Technische Universität Berlin, Hardenbergstr. 36, D-10623 Berlin, Germany

[b]Physikalisches Institut, Universität Frankfurt, D-60054 Frankfurt, Germany

9.7 cm

We investigated with Raman scattering under high pressure and as a function of temperature the magnetic and phononic excitations in the low-dimensional spin compound $(VO)_2P_2O_2$ (VOPO). In the ambient pressure (AP) phase VOPO comprises two structurally different antiferromagnetic alternating spin chains which are supposed to degenerate to a single chain in the high pressure (HP) phase. In our experiments we studied the interaction of low-energy phonon modes with the spin system of both phases and compared our results with a model of Uhrig *et al.* (PRB **63** 134418 (2001)) developed for the AP phase. We found that the small crystallographic differences between the two phases result in a significant alteration of the magnon-phonon coupling mechanism.

13.4 cm

Subject category :

3. Transition Metals, Alloys and Compounds

Presentation mode :
oral

Corresponding author :
U. Kuhlmann

Address for correspondence :
Institut für Festkörperphysik
Sek. PN 5-4
Technische Universität Berlin
Hardenbergstr. 36
D-10623 Berlin, Germany

Email address :
kuhli@physik.tu-berlin.de