

Abstract Submitted
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Field-induced thermal transport in low-dimensional antiferromagnets¹ ALEXANDER CHERNYSHEV, UC Irvine — Recent thermal transport experiments in a number of low-dimensional antiferromagnets such as $K_2V_3O_8$, Nd_2CuO_4 , Pr_2CuO_4 , $TlCuCl_3$ and others have shown that the low-temperature thermal conductivity can be strongly increased by a modest magnetic field. It was suggested that this effect could be due to the field-induced heat transport by spin excitations. We show that in most of the reported cases the observed enhancement of the thermal conductivity is not of spin, but of phononic nature. That is, the increase in the thermal conductivity occurs because of the decrease of the scattering of phonons on spin excitations. This decrease is due to the field-induced gaps in the spin-excitation spectra. Our calculations reproduce quantitatively all characteristic field-dependencies observed in experiments such as increase of the thermal conductivity and its saturation in higher fields. A number of suggestions for future experiments is made.

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