EFFECTIVE SOUND ATTENUATION EXPONENTS IN MAGNETS

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In this paper we try to explain how some magnets belonging to the Heisenberg universality class can be characterised by positive sound attenuation exponents near the critical point. In magnets which are also insulators the sound attenuation exponent should be equal to 2α [1,2] where α is the usual specific-heat exponent. This exponent is however negative in the Heisenberg universality class. In this paper we interpret the positive attenuation exponents measured in isotropic magnets as $RbMnF_3$, $Y_3Fe_5O_{12}$ and $Gd_3Fe_5O_{12}$ in terms of the effective critical exponents. The large value of sound attenuation exponent in anisotropic FeF_2 can also be interpreted in this way.

[1] Kawasaki K., *Phys. Lett. A* **29**, 406 (1968)
[2] Pawlak A., *Eur. Phys. J. B* **4**, 179 (1998)

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