A parametric model for global thermodynamic behaviour of ultrasonic attenuation in magnetic field

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The ultrasonic attenuation and velocity variations are theoretically investigated near the Curie temperature of ferromagnet under an application of magnetic field. The temperature, frequency and magnetic field dependence of acoustic properties of ferromagnet near a critical point is given. A parametric representation is used to describe a crossover from critical to classical region far away from the critical point. The crossover scaling functions are determined for sound attenuation coefficient and dispersion. We compare the proposed crossover model with experimental ultrasonic data for manganese phosphide MnP and find good agreement between theory and experiment.

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