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Dilatometric Study of $LiHoF_4$ In a Transverse Magnetic Field[1]
JOHN DUNN, CLAUDIA STAHL, ROBERT HILL, University of Waterloo — Theoretical and experimental work have not presented a consistent picture of the phase diagram of the nearly ideal Ising ferromagnet $LiHoF_4$ in a transverse magnetic field. Using a capacitive dilatometer, we have investigated the thermal expansion and magnetostriction of $LiHoF_4$ in magnetic fields applied perpendicular to the Ising direction. Critical points for the ferromagnetic phase transition have been determined at low fields close to the classical phase transition. Excellent agreement has been found with existing experimental data suggesting that, in this regime, the current theoretical calculations have not entirely captured the physics of this interesting model system.

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