

Nanosized monolayer on the square lattice within spin-1 Ising Model: Hysteretic Properties with odd interactions

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Abstract: We propose a theoretical framework for the investigation of M - H and Q - D hysteresis loops for the nanosized monolayer on the square lattice within spin-1 Ising model Hamiltonian with dipolar (J), quadrupolar (K), dipolar-quadrupolar (odd, L) interactions and single-ion anisotropy parameter (D) in pair approximation. We observed that the shift of these loops depends on K , D , temperature (T) and monolayer size (R). These are also discussed in relation with the experimental and theoretical findings.

Keywords: Nanosized square lattice, Pair approximation, Biquadratic interaction, Odd interaction, Hysteresis loops