Hysteretic properties of magnetization and quadrupolar moment in the blume-emery-griffiths model under the pair approximation

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Abstract: The magnetic hysteresis (M-H) and quadrupole hysteresis (Q-D) loops have been investigated for the Blume-Emery-Griffiths (BEG) model using the pair approximation. The observed curves strongly depend on biquadratic exchange interaction (K). Especially, M-H loops show different and novelty properties from those which depend on negative D values. Besides, we presented the M-D and Q-H behaviors which are in good agreement with the other theoretical findings.

Keywords: Blume-Emery-Griffiths model, pair approximation, magnetic hysteresis, quadrupole hysteresis