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U. Hartmann

IN SITU OBSERVATIONS OF INTERACTIONS BETWEEN BLOCH WALLS AND LOCAL CRYSTALLINE DEFECTS

The influence of local crystalline defects upon the magnetization reversal process of single-crystalline iron whiskers has been investigated by direct observation of the domain configuration and by inductive magnetization measurements. As an essential result, the investigations bring to evidence that only weak interactions are obtained between the dislocations and 180° Bloch walls. On the other hand, a strong pinning efficiency to 90° Bloch walls is observed which is due to the stress field created by the perturbation.

J. Appl. Phys. **63**, 167 (1988)

U. Hartmann

MICROMAGNETIC STABILITY CRITERION FOR INHOMOGENEOUS MAGNETIZATION DISTRIBUTIONS

The micromagnetic stability criterion is derived for general magnetization distributions which are already inhomogeneous in the thermodynamic equilibrium state. The approach might result in a general solution of Brown's coercive paradox. Additionally the derivation permits an easy verification of the classical stability criteria for uniform magnetization distributions based upon Brown's theory of micromagnetic materials.

Phys. Rev. B **37**, 5299 (1988)

U. Hartmann

MAGNETIC FORCE MICROSCOPY: SOME REMARKS FROM THE MICROMAGNETIC POINT OF VIEW

The present communication focuses on a critical micromagnetic discussion of the promising analytical possibilities with regard to ferromagnetic fine structures offered by the recent invention of magnetic force microscopy. As a result, some limiting constraints for the analysis of soft and hard ferromagnetic media are derived which have to be taken into account for an interpretation of the experimental results.

J. Appl. Phys. **64**, 1561 (1988)

U. Hartmann

OBSERVATION OF A NEW DOMAIN NUCLEATION PROCESS IN SOFT MAGNETIC MATERIALS

A critical bowing of 180° Bloch walls during the magnetization reversal process leads to a structural decomposition of these walls into a periodic arrangement of 90° transverse domains. The nucleation process is accompanied by a considerable decrease of the susceptibility and provides a source of irreversibilities in the overall magnetization process even under the influence of external fields which are small compared to the magnetocrystalline anisotropy field. The process is investigated on isolated subdivided 180° Bloch walls in iron whisker samples by means of X-ray topography and magneto-optical observation techniques. The nucleation field distribution and the critical inclination of the walls are deduced from inductive measurements.

Phys. Stat. Sol. (a) **108**, 387 (1988)

U. Hartmann

BEOBACHTUNG FERROMAGNETISCHER FEINSTRUKTUREN MIT DER INTERFERENZKONTRAST-KOLLOIDTECHNIK

Leitz Mitt. u. Techn. **IX**, 99 (1988)

U. Hartmann

INFLUENCE OF THE BLOCH-WALL FINE STRUCTURE ON THE MAGNETIZATION PROCESS OF SOFT MAGNETIC MATERIALS

Proc. SMM 8 Conference, Badgastein, Austria, 1987; Physica Scripta **39**, 268 (1988)

U. Hartmann and C. Heiden

CALCULATION OF THE BLOCH WALL CONTRAST IN MAGNETIC FORCE MICROSCOPY

Proc. STM 88 Conference, Oxford, U.K., 1988; J. Microsc. **152**, 281 (1988)

U. Hartmann

STATIC MAGNETIZATION IRREVERSIBILITIES IN SOFT FERROMAGNETIC MEDIA OF HIGH CRYSTALLINE PERFECTION

The origin of irreversibilities and nonlinearities during the quasistatic magnetization-reversal process of soft magnetic media is investigated on highly perfect iron whisker single crystals. As a result of inductive measurements and direct domain observations, the static magnetization hysteresis can be led back to the fundamental mechanisms of geometry effects, the surface influence, and wall-induced phenomena.

Phys. Stat. Sol. (a) **110**, 247 (1988)

R. Berthe, U. Hartmann and C. Heiden

SPATIALLY RESOLVED LOW-TEMPERATURE SPECTROSCOPY ON NIOBIUM BULK SAMPLES

Proc. STM 88 Conference, Oxford, U.K., 1988; J. Microsc. 152, 831 (1988)

T. Göddenhenrich, U. Hartmann, M. Anders and C. Heiden

INVESTIGATION OF BLOCH WALL FINE STRUCTURES BY MAGNETIC FORCE MICROSCOPY

Proc. STM 88 Conference, Oxford, U.K., 1988; J. Microsc. 152, 527 (1988)