Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Energy of domain walls in ferrite films[1] M.E. GOMEZ, P. PRIETO, Universidad del Valle, A. MENDOZA, O. GUZMAN, Universidad del Quindio —
MnZn Ferrite films were deposited by RF sputtering on (001) single crystal MgO substrates. AFM images show an increment in grain size with the film thickness. Grains with diameter between $\Phi \sim 70$ and 700 nm have been observed. The coercive field H_c as a function of the grain size reaches a maximum value of about 80 Oe for $\Phi_c \sim 300$ nm. The existence of a multidomain structure associated with a critical grain size was identified by Magneto-optical Kerr effect technique (MOKE). The transition of the one-domain regime to the two-domain regime was observed at a critical grain size of $D_c \sim 530$ nm. This value agree with values predicted previously. The Jiles-Atherton model (JAM) was used to discuss the experimental hysteresis loops. The k pinning parameter obtained from JAM shows a maximum value of $k/\mu_o = 67$ Am^2 for grains with $L_c \sim 529$ nm. The total energy per unit area E was correlated with k and D. We found a simple phenomenological relationship given by $E \quad \alpha\ kD;$ where D is the magnetic domain width.

[1]Work supported by COLCIENCIAS, research Project No. 1106-05-17612 and the Excellence Center for Novel Materials

M. E. Gomez
Universidad del Valle

Date submitted: 14 Nov 2006 Electronic form version 1.4