

Memorandum 6M-4362

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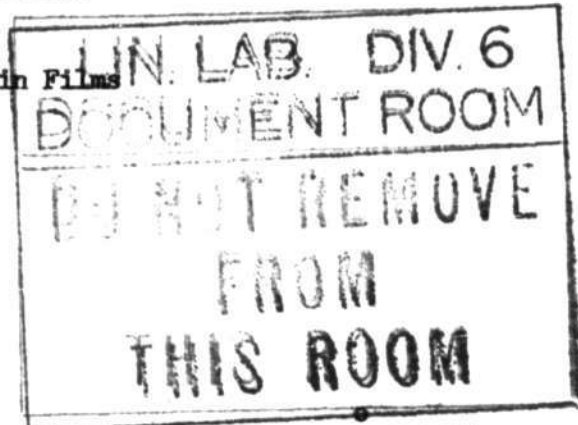
Division 6 - Lincoln Laboratory
 Massachusetts Institute of Technology
 Lexington 73, Massachusetts

SUBJECT: Magnetization Reversal in Thin Films

To: Group 63, Staff

From: Donald O. Smith

Date: June 4, 1956

Approved: John B. Goodenough
John B. Goodenough

Abstract: The magnetization reversal of thin films ($\approx 1000 \text{ \AA}$ thick) of 80-20 Permalloy has been studied in a strip transmission line. These films are evaporated onto a heated glass substrate in the presence of an orienting field. Magnetization reversal along the axis of initial orientation takes place in times less than 20 μsec in any reversing field large enough to overcome the orienting energy. The switching coefficient S_w is defined by $S_w = H_m \tau$, with τ the reversal time and H_m the reversal field. The experiment gives $H_m = 1 \text{ oe.}$ and $\tau < 2 \times 10^{-8}$ seconds from which $S_w < 2 \times 10^{-8} \text{ oe.-sec.}$ Reversal by rotation of the magnetization as a whole in the plane of the film yields a model which is consistent with the observed reversal times. Preliminary measurements of the initial permeability perpendicular to the orientation axis have been carried out to 2000 mc and do not yet reveal the expected frequency dispersion of the initial permeability. This is an indication that S_w may be another order of magnitude smaller than reported here.

Donald O. Smith
 Donald O. Smith

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Distribution: All of Group 63 staff to receive abstracts only.

Note: This report has been submitted as a Letter to the Editor for the Physical Review. Copies may be obtained from Mrs. Muriel Durso, B-181.