

in 0.25 microsecond increments. The vertical coordinate is the actual emf developed across the pickup coil. In Figure 5.6, the experimental magnetization curves are presented along with the theoretical curves for the interacting grain and independent grain assumptions. The two series of shots correspond to approximately one-third and two-thirds of the Hugoniot elastic limit in YIG. This has been reported as 64 kbars¹⁰ (attributed to R. A. Graham). In Figure 5.7, the data are plotted as a function of the normalized field H_e/e against which the predicted magnetization curves for any induced anisotropy field are self similar. The vertical error bars are determined by the experimental extremes as discussed in Section 5.3. The horizontal error bars are $\pm 6\%$ which is the rms error for H_e and e .

TABLE 4.--Experimental results

Shot no.	Projectile velocity (mm/ μ s)	Projectile material	Mean strain in YIG	Magnetic field (oe)	Induced emf (volts) ^a	Specimen width (cm)	$\delta M/M_s$ ^b		
70-016	0.598	Plexiglass ROHM and HASS Type-G	-0.0083	359	20.5	1.060	0.332 \pm .066		
70-030 ^c	0.602			245	----	1.063	0.602 \pm .100		
70-039	0.600			258	62.4	1.067	0.515 \pm .033		
70-053	0.601			588	11.2	1.075	0.089 \pm .034		
70-057	0.596			494	21.6	1.085	0.173 \pm .037		
70-059	0.598			680	4.6	1.081	0.039 \pm .015		
70-002	0.597			421	30.3	1.023	0.260 \pm .055		
70-013	0.598			787	2.5	1.081	0.018 \pm .010		
70-015	0.551			Aluminum oxide WESGO-995	-0.0162	660	48.5	1.068	0.400 \pm .030
70-016	0.555					935	20.5	1.032	0.173 \pm .038

^aThis emf was developed across 10 turn pickup coils with the exception of shot no. 70-016 which used a 5 turn pickup coil. The values were obtained through Equation (5.8).

^bCalculated with an M_s of 128 gauss. See Section 4.4.

^cOn this shot, the solenoid was prematurely shorted. These values were obtained by estimating the field due to residual current and knowledge of the circuit inductances and resistances.