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**Magnetoresistance anomalies during hard axis magnetization reversal in (Ga,Mn)As epilayers.** MENG ZHU, GANG XIANG, BEN LI SHEU, XIA LI, PETER SCHIFFER, NITIN SAMARTH, Physics Department, Penn State University, University Park PA 16802 — The ferromagnetic semiconductor (Ga,Mn)As is known to display striking magnetoresistance (MR) during magnetization reversal. Here, we use temperature- and field-dependent MR measurements to probe hard axis magnetization switching processes in (Ga,Mn)As epilayers grown on (001) GaAs. MR is measured using Hall bars oriented along the three principal crystalline directions ( $[100]$ ,  $[\bar{1}10]$  and  $[110]$ ) over a temperature range  $0.35 \text{ mK} \leq T \leq 120 \text{ K}$ , with the magnetic field normal to the sample plane. We find that the longitudinal MR exhibits distinct signatures corresponding to different types of magnetization reversal processes. While domain wall nucleation and propagation produce large MR anomalies ( $\sim 50\Omega - 100\Omega$ ), coherent domain rotation is accompanied by surprisingly weak MR. We discuss our experimental measurements using analytical simulations that incorporate SQUID magnetization data as additional input. Supported by DARPA/ONR and NSF.

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