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Magnetoplastic Properties of Thick Films on Nitinol Substrate AMANDA GREGORY, Texas State University at San Marcos, MARTIN SABLIK, Applied Magnetic and Physical Modeling, San Antonio, Texas, WILHELMUS GEERTS, KYLE SMITH, ANUP BANDYOPADHYAY, Texas State University at San Marcos, FERNANDO LANDGRAF, Universidade de Sao Paulo, Sao Paulo, SP, Brazil, MARCOS DE CAMPOS, Universidade Federal Fluminense, Volta Redonda, RJ, Brazil — Understanding the magnetic properties of plastically deformed thin films is vital to the development of thin film devices that will undergo unavoidable stressing. We covered polished nitinol substrates with Fe and Fe-Si films up to 1 micron thick and subjected them to stress which was performed both laterally and by bending over cylinders. Under extreme lateral straining the films would inhomogeneously detach from the substrate. In samples that underwent strain via bending there was no observed film detachment. The magnetic remanence decreased when applied parallel to the stress axis and increased when applied perpendicularly. The coercivity of the strained films exhibited marked change only when measured perpendicular to the stress axis, where it was observed to decrease. Modeling calculations show that residual compressive stress dominates the magnetoplastic properties of thin films.

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