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**Magnetostriction and effect of stress on hysteresis and anhysteretic magnetization of multilayered FeNi-Fe heterostructures** PETER FINKEL, Drexel University, ED GARRITY, ACR Scientific — We report on the low-field magnetic properties of thin film FeNi-Fe multilayered samples under tensile stress. Anhysteretic magnetization as a function of stresses was measured using a conventional vibrating sample magnetometer combined with a specially designed loading fixture providing controlled uniaxial stresses. Stresses are deduced from the characteristic resonant frequency of the sample in the fixture. Anhysteretic permeability was extracted from the anhysteretic  $B - H$  curves constructed by degaussing the sample at given longitudinal dc field. The magnetostriction contribution to dc magnetization under elastic stress and the effect of the plastic strain on the hysteresis loops were measured. The large positive magnetostriction of FeNi layer is found to compensate negative magnetostriction of the Fe layer. This leads to higher susceptibility and lower coercivity for low tensile stress. The drop in coercivity was particularly sensitive to film stress/strain. Larger stresses result in plastic strain of the sample which induces an increase in dislocation density and subsequently domain wall pinning. This causes an increase in coercivity and decrease in anhysteretic permeability at the highest stresses. The paper summarizes these effects.

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