

Abstract Submitted  
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**A method for anhysteretic magnetization and magnetostriction measurement of a thin ferromagnetic films as a function of an applied isotropic stresses** PETER FINKEL, Thomson/Rowan University, ED GARRITY, Thomson — A new method of the stress dependant anhysteretic magnetization and magnetostriction measurements in a thin-film ferromagnetic materials is described. This method is based on conventional vibrating sample magnetometer system combined with the specially designed loading fixture providing sizable uniaxial stresses on thin film and wires. For determining uniaxial stresses in thin-film and wires anisotropic ferromagnetic samples contactless method was developed. Stresses are deduced from characteristic resonant frequency of the sample vibrating in the special fixture and verified using pulse propagation velocity monitoring. Vibration of the sample is measured remotely using a laser Doppler vibrometer. This contactless method has been demonstrated for membrane thickness down to 50  $\mu\text{m}$  and stresses up to 1GPa. Estimated accuracy of this method is better than 0.2%. This method was applied to measure anhysteretic permeability and magnetization curve of Ni-Fe as a function of stress and temperature. This technique was also shown to be able also used to measure magnetostriction coefficient as a function of external magnetic field.

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