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Barkhausen Noise, Domain Structure and Entropy in Magnetic Amorphous Ribbons Under Stress ALBERTO GUIMARAES, Centro Bras. Pesq. Fisicas (CBPF), ANDRE GUNDEL, UFSM, LUCIANA SANTI, UFSM, RUBEM SOMMER, UFSM — The effect of applied stress on the magnetization process of magnetostrictive Fe78B13Si9 and amorphous Fe73.5Cu1Nb3Si13.5B9 metallic ribbons was investigated by estimating the entropy of the Barkhausen noise time series. The Barkhausen series is formed of voltage pulses detected by a coil around a ferromagnetic sample under an applied magnetic field. The stress induces a preferred orientation on the domain walls and reduces their thickness. The entropies calculated from the Random Field Ising Model simulations with different degrees of disorder were also analyzed and the results compared to the experimental data. In both cases, the relative entropy is calculated from the size of the Barkhausen noise time series packed by applying the LZ77 (zipping) algorithm. In the case of the experimental curves, an increase in the relative entropy was observed above a given stress level, possibly as a result of the decrease of the domain wall width. The results are also compared with domain structures observed by Kerr microscopy and to magnetization curves obtained by the inductive method.

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