

Abstract Submitted
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Stress and Depth Dependence of Stochastic Processes in the Barkhausen Effect DAVID JILES, Iowa State University, Ames, Iowa 50011, LUKASZ MIERCZAK, EUGENE MELIKHOV, Wolfson Centre for Magnetism, Cardiff University, United Kingdom, IOWA STATE UNIVERSITY TEAM, WOLFSON CENTRE FOR MAGNETICS TEAM — Magnetic Barkhausen Noise (MBN) consists of discontinuous stochastic changes in flux density caused by sudden irreversible changes in magnetization as the magnetic field H changes continuously. These changes can be detected at the surface by a magnetometer, which in its simplest form can be in the form of voltage pulses caused in a pickup coil. The amplitude of such pulses has been shown to depend on the microstructure and stress in the material. Propagation of Magnetic Barkhausen emissions in magnetic materials is frequency dependent and therefore information from different depths inside the material is contained in the frequency spectrum of the detected Barkhausen signal at the surface. However the depth dependent information, although present, is difficult to extract from the measurements. Despite this extracting the depth dependent information about material conditions, such as variations in microstructure and/or the presence of residual stress is of a great interest. This work presents a new method for extracting this information from measured MBN signals.

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