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Eddy-current non-destructive testing system using amagnetic sensor based on GMR

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Abstract : Detecting the cracks is a major challenge in the development of Eddy Current (EC) Non-Destructive Testing (NDT). In fact, the detection sensitivity of EC-NDT depends on the interaction between the crack characteristics and the EC formed in the materials. The induced currents are primarily generated along a single direction in the tested sample. This paper presents a excitation method for generating a ac magnetic field and, consequently, eddy currents. This method significantly improves the detection of cracks of two different kind of material (non magnetic conductive material and ferromagnetic material). The magnetic flux density signature of the defect is studied using a 2D Finite Element Model FEM.

Keywords : Eddy Current, Non-Destructive testing, Giant Magneto Resistance, Finite Element Method