A New Procedure for Reconstruct the Aged Regions of the Ferromagnetic Bodies

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Abstract—**The aging of the ferromagnetic material, leads to changes of B-H relationship. This property may be used for detection of the degraded parts of ferromagnetic pieces. In numerical procedures the region with a possible aged zone is described by a finite number of subdomains where the flaw vector is defined with binary entries. Because of the small B-H changes, the magnetic field modifications linearly depend (matrix T) by the flaw vectors. Using a double Gauss pivotation scheme, an enough well conditioned and invertible submatrix is extracted from the matrix T. The unknowns associated with this submatrix (called main unknowns) can be easely obtained by a linear relationship from the rest of the unknowns (called minor). In the set of the minor unknowns we search for that vector which gives the smallest error of the principal unknowns in comparison with the values 0 or 1. This procedure leads to a spectacular increasing of the efficiency, in comparison with the known procedures.**

Index Terms—**NDT, magnetic flux leakage, half-deterministic method.**

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