Non-Destructive Inspection of Steel-Based Structural Components: Exploring the Potential of Magnetic Adaptive Testing for Measurement and Metrology

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Abstract. The Magnetic Adaptive Testing (MAT) method emerges as a promising avenue for non-destructive inspection of steel-based materials, offering significant potential in measurement and metrology applications. Overview of the properties and utilization prospects of MAT in this domain is provided. The theoretical framework underlying the MAT method, elucidating its fundamental principles, and highlighting its suitability for precise assessments of ferromagnetic materials is described. The article discusses the new researched evaluation approaches, which include several filtering methods and the comparison of correlation coefficients, evaluating the relationship between the measured properties of the material before and after applying the load, with the aim of increasing the accuracy and universality of the method. Furthermore, it addresses the primary sources of uncertainties encountered in MAT measurements.

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