

Editorial

Non-Destructive Metallic Materials Testing—Recent Research and Future Perspectives

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Academic Editor: Hugo F. Lopez

Received: 9 October 2017; Accepted: 10 October 2017; Published: 16 October 2017

Non-destructive testing (NDT) has become extremely important for microstructural characterization, mainly by allowing the assessment of metallic material properties in an effective and reasonable manner, in addition to maintaining the integrity of the evaluated metallic samples and applicability in service in many cases.

The aim of this special issue, “Non-Destructive Metallic Materials Testing—Recent Research and Future Perspectives”, is to disseminate technological advances, which have been reached through innovation and customization of non-destructive testing techniques, to present successful application cases, and to discuss possible future trends, endeavoring faster and more reliable decision-making processes concerning metallic materials.

Seventeen manuscripts were submitted to this special issue and, after a rigorous peer-review process, 10 excellent manuscripts were accepted: (I) Darong Zhu and co-authors propose a new method based on machine vision to characterize metal surface topography during fatigue; (II) Edgard M. Silva and collaborators study samples of rolled Society of Automotive Engineers (SAE) 1045 steel submitted to induced magnetic fields in the reversibility region of magnetic domains to detect the magnetic easy direction of the steel; (III) An investigation concerning ultrasonic guided wave propagation through lap joint welded plates used in the construction of storage tank floors is presented by Audrius Jankauskas and Liudas Mazeika; (IV) Girolamo Costanza and colleagues demonstrate how mechanical spectroscopy permits the monitoring of the evolution of lattice defects, porosity, and cracks which strongly affect the mechanical behavior of metals and sometimes lead to permanent damage; (V) The evolution of mechanical twinning during cyclic deformation of Mg-Zn-Ca alloys is studied by Alexei Vinogradov and co-authors; (VI) Using the advanced acoustic emission technique, Igor Rastegaev and collaborators address the problem of early identification of crack initiation and growth in ductile structural steels under cyclic loading; (VII) The effects of *Phyllanthus muellerianus* leaf-extract on steel-reinforcement corrosion in 3.5% NaCl-immersed concrete are studied by Joshua Olusegun Okeniyi and co-authors; (VIII) Edgard M. Silva and collaborators propose a solution for the detection of sigma phase in duplex stainless steels through the computational classification of induced magnetic field signals; (IX) An evaluation of mechanical properties with the hardness of building steel structural members for reuse by non-destructive testing (NDT) is presented by Masanori Fujita and Keiichi Kuki; (X) A review of electromagnetic-based crack sensors for metallic materials is presented by Muhammad Usman Memon and Sungjoon Lim.

The guest editors would like to express their deep gratitude to the editors, and all members of the Editorial Board and of the Editorial Office of Metals for the opportunity to publish this special issue, as well as thank them for their continued support during the publishing process, in addition

to all authors for sharing their excellent works and to all international experts that helped us in the peer-review process. To all of them, our sincere thanks!

Conflicts of Interest: The authors declare no conflict of interest.



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