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Special Issue: “Fatigue of Welded Joints - Current State-of-the-Art”

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Material fatigue is widely accepted as a dangerous and complicated phenomenon due to its tendency to cause sudden and unexpected failures in engineering structures. Seemingly unpredictable and sudden nature of fatigue continue to pose a risk for final users or, in more general terms, for people. Mitigating these risks represents the biggest challenge associated with accurate design against fatigue. Thus, reliable assessment of fatigue behaviour remains a major concern for engineers during the industrial design process.

In this context, a wide array of geometries, loading conditions and materials make it very difficult to assess fatigue accurately. These concerns are particularly prominent in welded joints, where significant changes in the material behaviour occur after welding both due to residual stresses and the presence of severe localised stress/strain concentration phenomena. Despite these difficulties, welded joints are considered indispensable for most structural applications. In addition, as other manufacturing processes, welding technologies constantly progress to match industry needs and expectations. In this context, fatigue design concepts are being investigated extensively, with this allowing them to keep evolving and improving alongside welding technologies and engineering structures.

In this challenging scenario, this special issue aims at presenting the state of the art scientific developments in the fatigue assessment of welded joints, with this being done by covering a wide array of topics.

We would like to thank all the authors for their valuable contributions and we are honoured to guest-edit this special issue presenting the latest developments in the field of fatigue of weldments. We would also like to thank the reviewers for the massive work they did to help improve the overall quality of the articles being included in this special issue. Finally, we would like to thank International Journal of Fatigue and Elsevier for making this special issue possible.