Editorial

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Biographical notes: Janez Grum is a Professor of Materials Science at the Faculty of Mechanical Engineering, University of Ljubljana, Slovenia. He is also the Founder and Editor-in-Chief of the *Journal of Microstructure and Materials Properties (IJMMP)*. He is the Organiser of 13 International NDT Conferences and Editor of 16 conference proceedings, 20 ASM, Marcel Dekker and Taylor & Francis, CRC Press, Springer, Kluwer Academic book chapters and 12 books published at Faculty Press. He has also published more than 280 refereed journal papers and 450 conference papers on heat treatment and surface engineering, laser materials processing and materials testing, including non-destructive testing.

Pavel Mazal is a Professor at the Institute of Machine and Industrial Design at the Faculty of Mechanical Engineering, Brno University of Technology. He is a head of the Laboratory of fatigue properties and acoustic emissions. He is engaged in different industrial applications of acoustic emission method. From 2000, he is a President of the Czech Society for NDT and Head of the Center of Technical Standardisation in the area of non-destructive testing in Czech Republic. He is the main organiser of many international conferences such as ECNDT 2014, EWGAE 2002 ad 2016, NDE for Safety/Defektoskopie, NDT in Progress etc.

The first part of this special issue is entitled 'News in Acoustic Emission' and contains an extended version of the papers presented at the *32nd European Conference on Acoustic Emission Testing* held in Prague, the Czech Republic from 7–9 September, 2016. This conference was organised by the European Working Group on Acoustic Emission in cooperation with the Czech Society for Non-destructive Testing.

The primary objective of the *32nd European Conference on Acoustic Emission Testing* was an exchange of information on research and industrial applications of science and technology of Acoustic Emission (AE). The conference brought together the

expertise of scientists and engineers in academia and industry and covered activities relevant to the effective monitoring of systems.

This section of IJMMP V12 N3/4 comprises four extended papers which present various topics related to non-destructive testing.

Calabrese et al. presented acoustic emission data analysis for discriminating different corrosion forms. Corrosion attacks have been obtained on three different types of martensitic stainless steel in a FeCl3 solution according to ASTM G48 standard. These martensitic stainless steels were characterised by different mechanical, microstructural and electrochemical properties, which led to specific corrosion forms. A multivariate statistical analysis approach was adopted to evaluate AE data. Specific clusters of variables related to specific corrosion phenomena were identified to discriminate specific corrosion mechanism.

Calabrese et al. also studied the use of b-value and I*b*-value of acoustic emission in monitoring hydrogen assisted cracking of martensitic stainless steel. A time domain approach was adopted in order to analyse the corrosion phenomena by acoustic emission pattern time evolution. An appropriate set of variables was used, some of them directly related to the acoustic event such as *b*-value and I*b*-value that are related to the event energies. Authors show how to obtain for damage progression.

Nikulin et al. investigated deformation and fracture analysis of nitrided steels by acoustic emission. They studied the process of static tension deformation and fracture of nitrided sheer samples of two steels type ASIS 439 and type AISi 446. The nitrating was performed with pure nitrogen at $T = 1000–1100°C$ and followed by annealing at 675°C led to the formation Cr_2N type precipitation in nitrogen ferrite microstructure. In spite of the significant strengthening, the nitrided specimens fracture mostly by the ductile or quasi-ductile mechanism occurs. It was established that crack nucleation on larger particles is the cause of the plastic flow stability loss in 15Kh25T steel in the nitrided state.

Kratochvilova et al. analysed the fatigue process of selective laser melting materials by acoustic emission. The selective laser melting materials technology belongs to rapid prototyping technologies and allows quickly procedure metal parts with complicated shapes. However, the mechanical properties of these materials are currently worse than those of conventional produced materials.

Acoustic Emission method was used to compare fatigue behaviour of selective laser melting and conventionally produced materials. Tested materials were aluminium and copper alloys.

We sincerely hope that the papers published will be a valuable source of information for engineers and researchers at their professional work.