

PREFACE

This volume contains papers selected from more than 160 contributions presented during the 5th international conference “Materials Structure & Micromechanics of Fracture (MSMF-5)”, Brno, Czech Republic, June 27-29, 2007.

The first conference of the MSMF series was held in Brno, June 1995. The participants decided to repeat such conferences in Brno each three years. The basic idea was to establish a periodical international forum presenting multiscale approaches in fatigue and fracture of materials. Therefore, respective sections focused on atomistic models, models based on crystal defects, numerical and statistical models based on continuum mechanics, advanced experimental methods and relationships between structure and mechanical properties appeared during the MSMF-2 conference in 1998. In particular, the power of atomistic and mesoscopic approaches in fracture was clearly demonstrated by participants at the MSMF-3 meeting in 2001. The view of multiscale approaches in modeling deformation and fracture has created the framework of the MSMF-4 conference in 2004.

The conference MSMF-5 has successfully carried on the tradition of previous conferences. Nearly 180 scientists from 27 countries all over the world presented a variety of fundamental relations between structural and mechanical characteristics of materials. In collaboration with the International Advisory Board, the organizers have asked Prof. V. Vitek (University of Pennsylvania, USA), Prof. J. W. Morris (University of California, USA), Prof. H. Mughrabi (University of Erlangen-Nürnberg, Germany), Dr. P. Lukáš (Institute of Physics of Materials, Academy of Sciences, Czech Republic), Prof. R. Pippan (Erich Schmid Institute of Materials Science, Austria) and Prof. Y. Kondo (Kyushu University, Japan) to prepare plenary key-note lectures. Additional top scientists were asked to give key-notes in sections. The related papers, ordered approximately according to the atomistic-mesosopic-macroscopic sequence, are presented in this volume.

It is my pleasure to thank the editorial board of the journal Materials Science Forum for the readiness to publish this volume devoted to MSMF-5. I would also like to thank all members of the Organizing Committee, members of the International Advisory Board, session chairpersons as well as many colleagues who helped with the preparation of the conference and, particularly, with the preparation of the Proceedings.

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Pavel Šandera,
Editor