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PREFACE

Proceedings of the 39th Risø International Symposium on Materials Science: *Fatigue of Composite Materials: Microstructure, Mechanics and Methods*

S. Fæster, S. Goutianos, H. Lilholt, B. Madsen, L.P. Mikkelsen, B.F. Sørensen, H.L. Toftegaard

The 39th Risøe symposium aims to address the current research activities and future trends on the fatigue of high performance composite materials for structural applications (e.g. wind turbine blades). It aims to provide a forum for discussion, which covers all aspects of fatigue of composites: from microstructure to composite structures.

The focus of the symposium is on polymer matrix composites for structural applications, i.e. composites with long, aligned glass, carbon, metal, natural or polymeric fibres. With such a strong focus, we aim to enhance interactions among scientists and engineers from both Academia, Research Institutions and Industries on the specific topic of fatigue of structural polymer fibre composites. Together with the high quality presentations on the basis of strict selection and long time for discussion, we hope to promote exchange of ideas between the participants.

The main topics of the symposium can be summarized as follows:

- Effect of properties of fibres, matrix and interface on fatigue properties
- Fatigue of two-fibre hybrid composites
- Improved fatigue test methods
- Size and scaling laws for structural design
- Delamination fatigue crack growth
- Multiaxial fatigue
- Microscale damage evolution
- Micromechanical modelling of fatigue life / fatigue limit
- Effect of residual stresses on fatigue
- Effect of microstructural defects on fatigue
- Monitoring fatigue damage in composite materials
- High cycle fatigue

The Proceedings contain 8 invited papers, and 11 contributed papers.

The 39th Risø International Symposium is organised by the Section of Composites and Materials Mechanics, Department of Wind Energy, Technical University of Denmark (DTU), at the Risø Campus. We would like to thank all those at DTU Wind Energy who assisted in the preparation of the Symposium. We appreciate additionally the support from the international advisory committee consisting of: Povl Brøndsted, DK; Douglas Cairns, US; Kristofer Gamstedt, SE; Todd Griffen, US; Hiroyuki Kawada, JP; Theodore Philippidis, GR; Marino Quaresimin, IT; Ramesh Talreja, US; Janis Varna, SE and Anastasios Vassilopoulos, CH.

