

Preface

This book compiles recent advances in research and development in the area of damage and fracture of composite materials and structures. Majority of these chapters have been presented and discussed at the Special Session on Damage and Fracture of Composite Materials and Structures of the 4th International Conference on Advanced Computational Engineering and Experimenting (ACE-X), held during 8–10 July, 2010 in Paris, France. Invited chapters on selected topics are included. The scope of the book covers experimental, analytical and computational aspects of the mechanics of fibrous composites. The chapters report on updates related to testing of composite samples for determination of mechanical properties, discussion on the observed failure mechanisms and numerical modeling of deformation response of the composites to loading. Behavior of fibrous composites, sandwich structures and fiber-metal laminates to impact and blast loading are discussed. Response of composite structures under both static and dynamic loading is described.

Each chapter is written as a self-contained report on recent research works of the respective authors. However, many issues related to damage and fracture of the composite are common. These include dominant fracture mechanisms, damage-based models and simulation approaches. The book is suitable not only for research, but also for advanced reference and applications.

We acknowledge contributions from authors, many of whom are principal researchers of their projects on characterization of composite materials and structures. Thank you to Hassan Osman Ali for assistance in preparing this monograph.

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