

# Part I

## Introduction

**Abstract** The monograph *Lamb-Wave Based Structural Health Monitoring in Polymer Composites* is based on the research project *Integrierte Bauteilüberwachung in Faserverbunden durch Analyse von Lambwellen nach deren gezielter Anregung durch piezokeramische Flächenaktoren* (Structural health monitoring of fibre-reinforced composites by means of piezoelectrically excited Lamb waves) funded by the German research foundation (DFG). Under the leadership of Prof. R. Lammering (Helmut Schmidt University/University of the Federal Armed Forces Hamburg) Prof. U. Gabbert (Otto von Guericke University Magdeburg), Prof. G. Mook (Otto von Guericke University Magdeburg), Prof. M. Sinapius (German Aerospace Center, Technical University Braunschweig), and Prof. T. Schuster (University of the Saarland Saarbrücken) investigated various topics related to guided wave-based structural health monitoring (SHM). This book compiles the developed approaches and covers important experimental as well as numerical aspects of this highly complex problem.