Special Issue “SHM—Structural Health Monitoring”

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During the last years, structural health monitoring (SHM) has become an emerging field of research, since this technology envisions an enhanced potential for lightweight structures, new methods of construction and allows for the introduction of a new safety concept. Furthermore, an extended availability of health monitored structures is expected.

Several research groups investigate the application of guided Lamb waves for SHM purposes. This basic principle of SHM through guided Lamb waves is based on structurally integrated actuators exciting ultrasonic waves. The latter interact with structural damages. These interactions can be measured through structurally integrated sensors.

Prof. F.-K. Chang (Stanford University, Department of Aeronautics and Astronautics, Structures and Composites Laboratory), Prof. V. Giurgiutiu from the Department of Mechanical Engineering der University of South Carolina, Prof. A. Suleman from the Instituto de Engenharia e Mecânica in Portugal, and Prof. Carlos Cesnik from the Department of Aerospace Engineering of the University of Michigan are leading scientists in the field of SHM.

Research groups at the Otto-von-Guericke-University Magdeburg, the Helmut-Schmidt-University/University of the Federal Armed Forces Hamburg and the German Aerospace Center, Braunschweig, started a cooperation aiming to jointly investigate health monitoring technology for carbon fiber reinforced plastics. After 3 years of collaborative research in the project “*Integrated Monitoring of Composite Structures through Lamb Wave Analysis after their Excitation by use of Piezoelectric Actuators*” the research group presents the state of the work in this thematic edition of the CEAS Aeronautical Journal supplemented by international contributions in the field of SHM through guided Lamb waves.

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