

Press release 03/2022

DYNAmore reaches important milestone in AIMM research project

Stuttgart, 14. Dezember 2022

The in-house Material Competence Center (MCC) of DYNAmore GmbH in Leinfelden-Echterdingen announces the successful setup and regular operation of the fully automated measuring and testing facilities for classical and modified tensile tests. As part of the Artificial Intelligence for Material Models (AIMM) research project, the MCC acquired a robot that handles the specimens and new camera systems from the project partner Zeiss. These enable both optical measurement of the specimen geometries in the micrometer range before the test as well as optical deformation (i.e. strain field) measurement during the test. The tensile specimens are prepared for the automation unit in a specimen magazine, while specifically and newly developed software runs the entire test procedure as well as manages data collection and further preparation for the downstream calibration procedures automatically. In addition to increased accuracy and reproducibility of the tests performed, the MCC thus increases its capacity for material card calibration in the field of crashworthiness. As part of the "AIMM" research project, the automated setup will also be used to obtain large numbers of training data sets for data-driven constitutive models. For this purpose, the data obtained will be automatically evaluated and subsequently stored in a suitable data format for training the yet to be finalized artificial intelligence algorithms.

"Tests on classic and modified tensile specimens are key for the timely and accurate identification of material properties, as well as the subsequent calibration of material models all the way up into the damage and failure regime - both of which are required by our customers for their simulations in crashworthiness simulations. We are pleased that, after only a few months of development, we have now been able to further improve our quality and speed requirements by automating the testing and the accompanying evaluation algorithms," says Professor André Haufe, head of the DYNAmore MCC.

Ressourcen:

[YouTube Video](#)

Logo of the research project:



Logo of the BMWK:

Supported by:



Federal Ministry
for Economic Affairs
and Climate Action

on the basis of a decision
by the German Bundestag

About AIMM (supported by the Federal Ministry for Economic Affairs and Climate Action)

The use of reliable and precise simulation methods is of fundamental importance for the development of future, efficiency-optimized and low-emission vehicle concepts. The aim of the Artificial Intelligence for Material Models (AIMM) research project is to supplement or replace the classic model-based constitutive laws with an alternative, data-driven material modeling approach. Especially regarding the use of new materials, whose mechanical behavior is becoming increasingly complex, the limits of conventional material laws are to be overcome. In AIMM, the focus will be on the faster use of new materials, the development of associated new test concepts for generating the necessary training data and the shortening of the characterization and modeling phase through automation of the processes by means of a simplified approach for predictive CAE applications.

About DYNAmore

As a software and development service provider, DYNAmore offers a product portfolio that includes the finite element software LS-DYNA, the pre- and post-processor LS-PrePost, the optimization software LS-OPT as well as numerous FE models for crash simulation (dummy, barricade, pedestrian, and most recently the human model HANS). The simulation suite LS-DYNA is co-developed by DYNAmore GmbH. DYNAmore has many years of project and development experience in model development and simulation industry (process simulation, passenger protection, vehicle crash) in all areas of mobility (aerospace, rail, and motor vehicles).

For questions regarding applications and test licenses DYNAmore is at your disposal.

DYNAmore is located in Stuttgart, Dresden, Ingolstadt, Berlin, Langlingen, Braunschweig, Munich, Zurich (CH), Linköping (S), Gothenburg (S), Turin (I), Versailles (F) and Dublin, Ohio (USA).

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