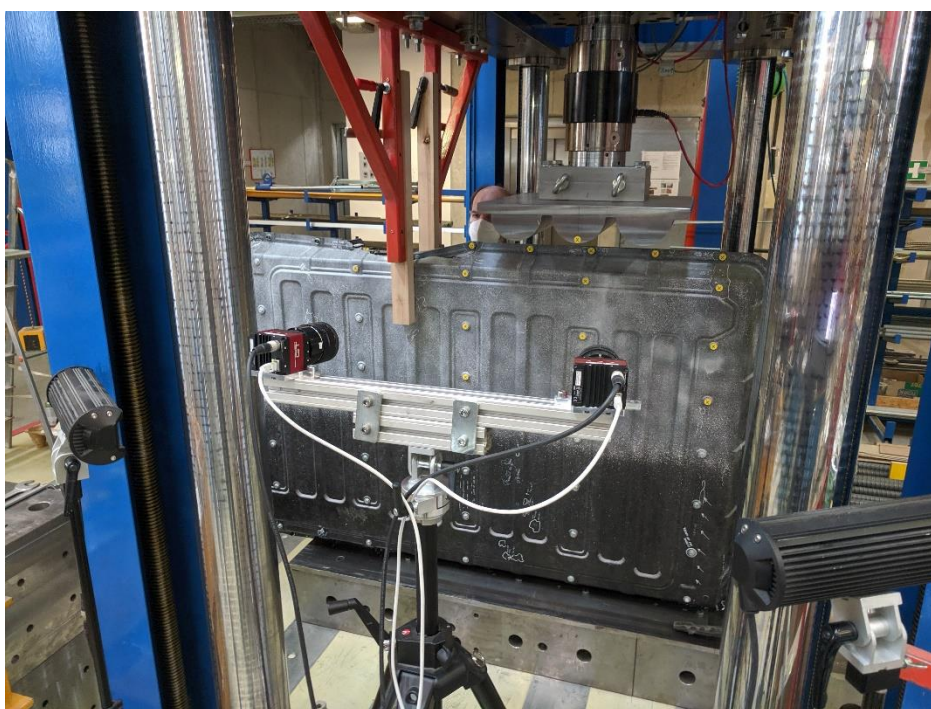




REAL TIME TRACKING SYSTEM



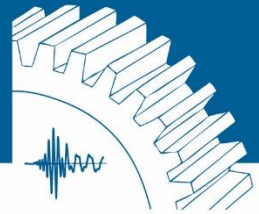
Application report

crash simulation of a vehicle battery tray

Ing. Uwe Fülöp

Graz University of Technology
Laboratory for Structural Engineering
in cooperation with the Institute of
Automotive Engineering





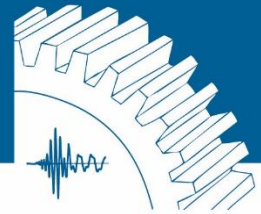
Set-up and experimental procedure



For this test, the interior of the battery tray was replaced by comparable parts made of concrete. The lateral structure of the battery tray was loaded at two points by means of a special load introduction construction. Basically, two aspects were at stake. Firstly, the fracture behaviour of the tray at the contact point and secondly, the deformation of the tray due to the displacement of the internal components. The measurement of the deformation should be recorded in the area of the load application up to approximately the middle of the tray. In addition to the deformations, strains on the carbon fibre construction were also to be recorded.

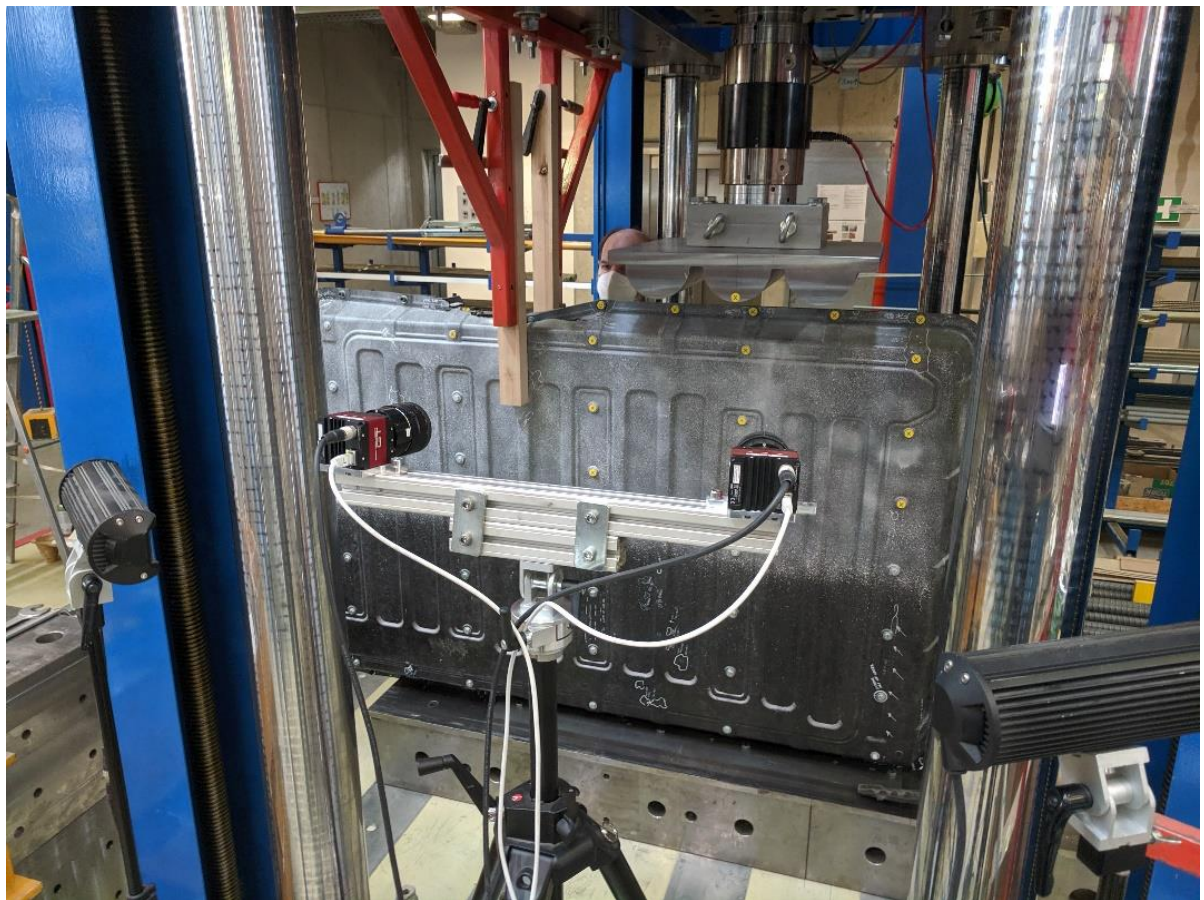
Mercury was used as a stereo sensor to obtain a 3D model of the tray.

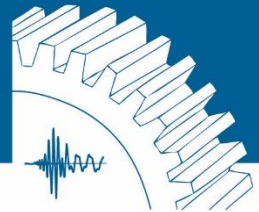
In this case, only white dots were sprayed onto the matt grey surface of the tray. In addition, the screw connection points were covered with measuring marks so that these could be used as measuring positions.



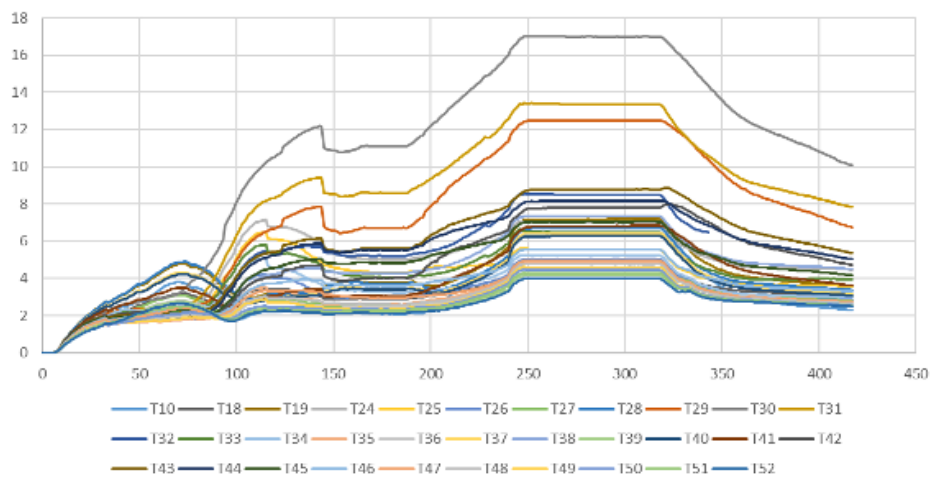
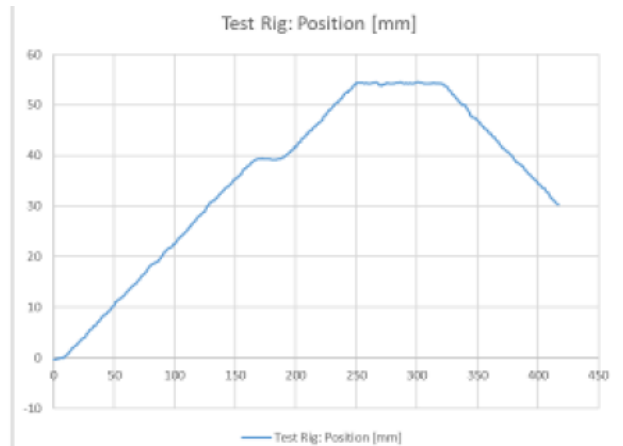
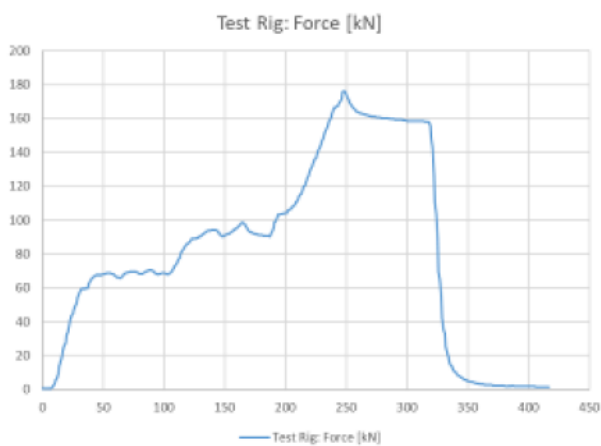
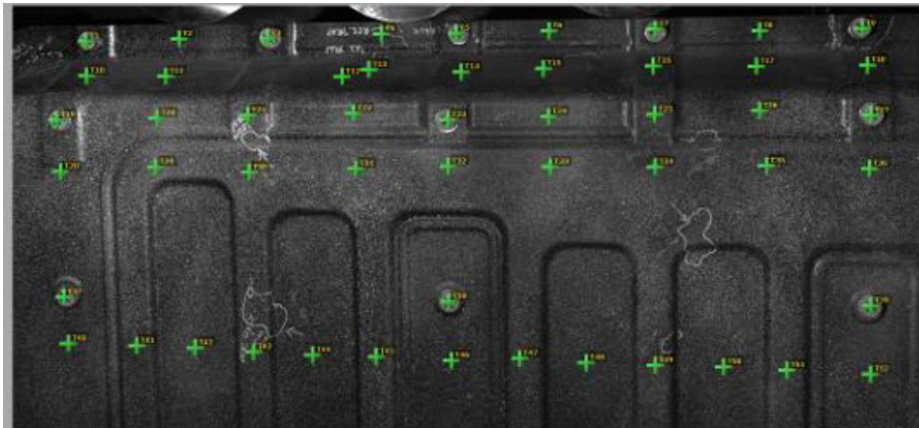
Configuration and settings

Measuring field size: approx. 700mm x 300mm
Camera resolution: 4864x3232px, cropped to 4864x2278px
Focal length: 50mm
Aperture: f/8
Distance of the cameras to the measuring object: 1100mm

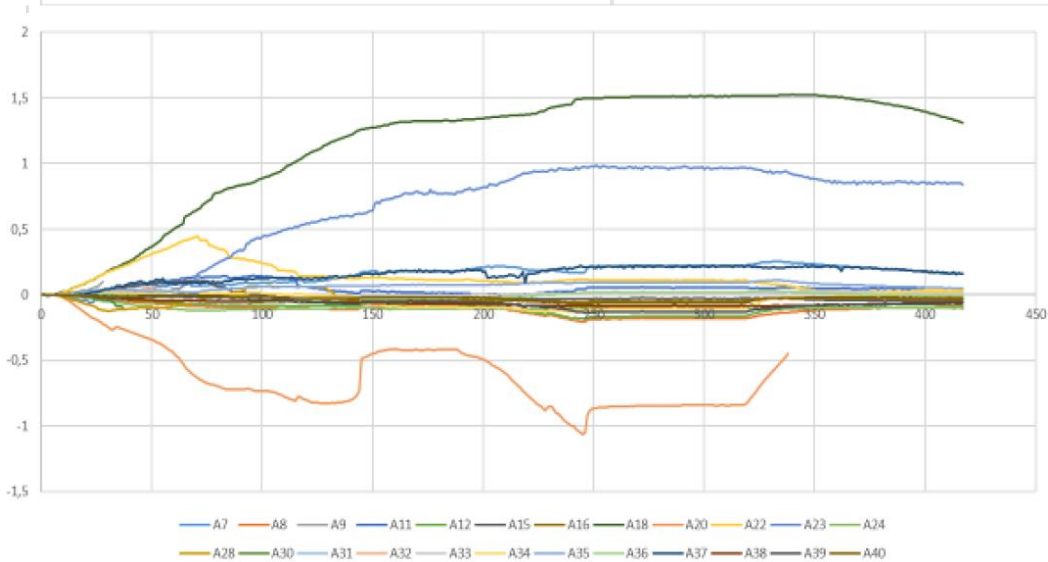
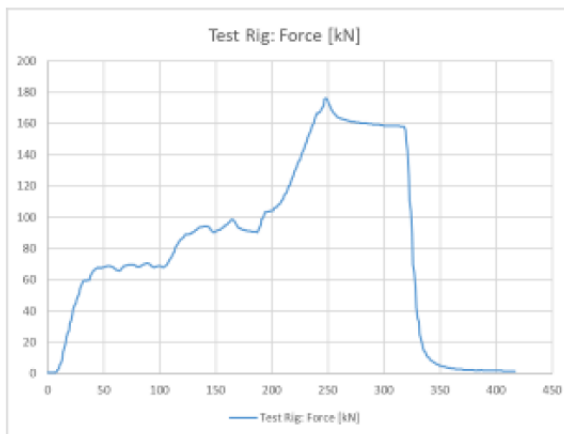
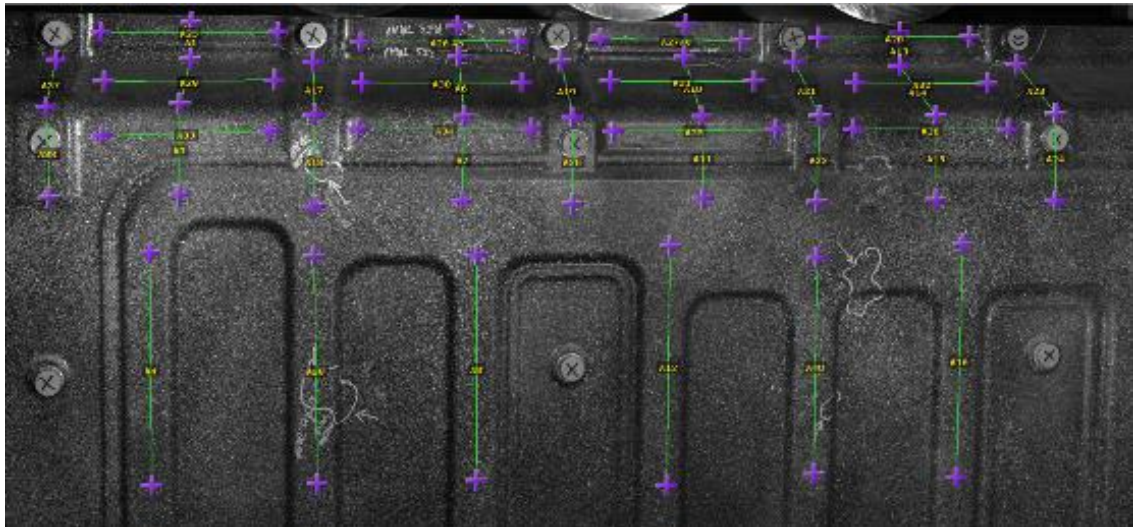
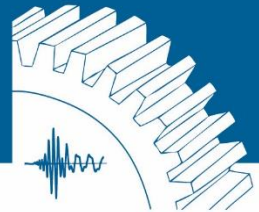




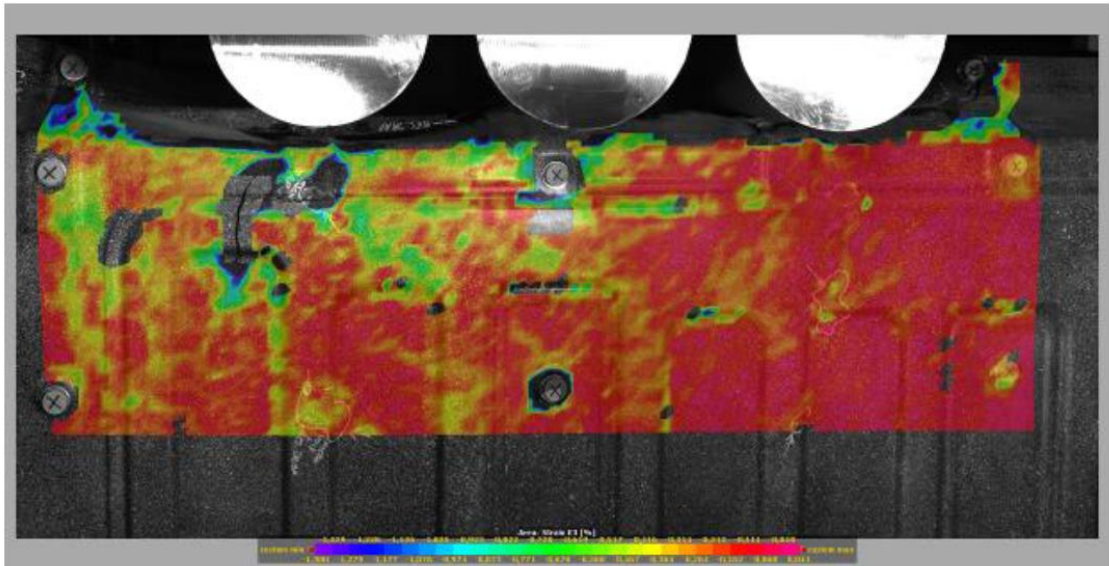
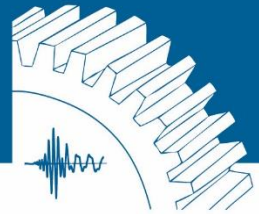
Analyses



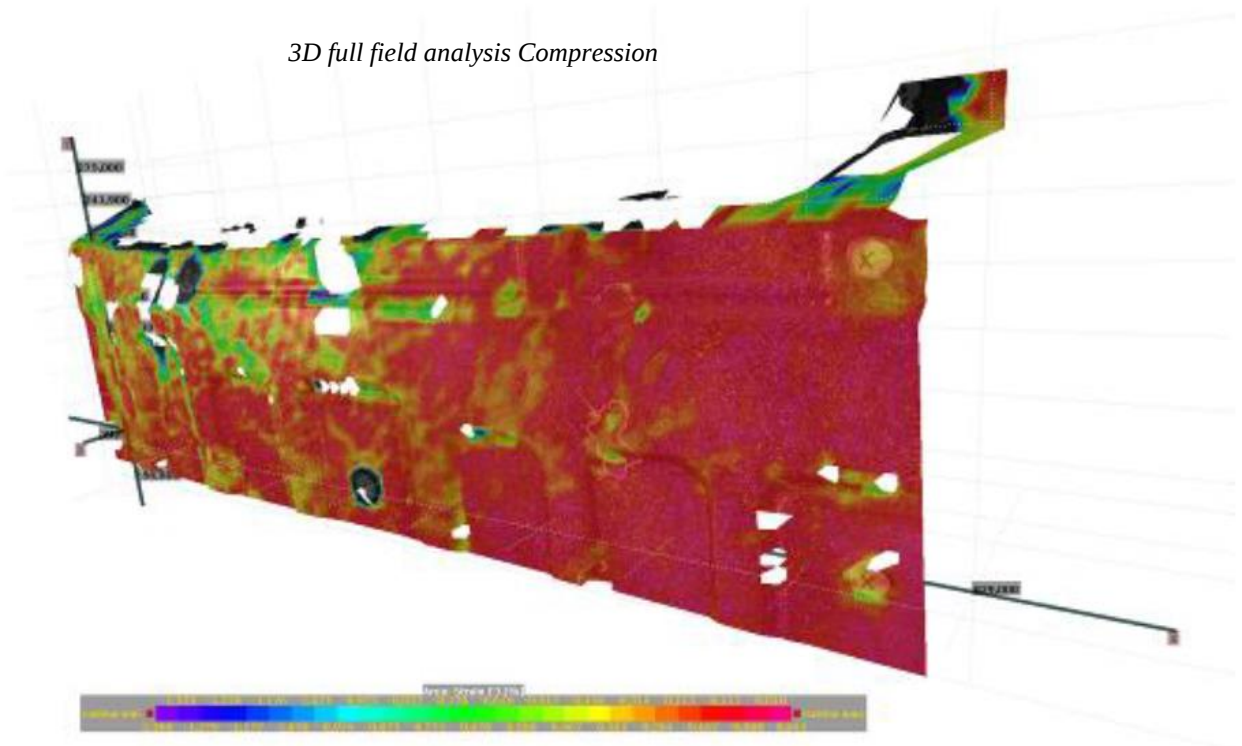
Point probe evaluation displacements [mm]



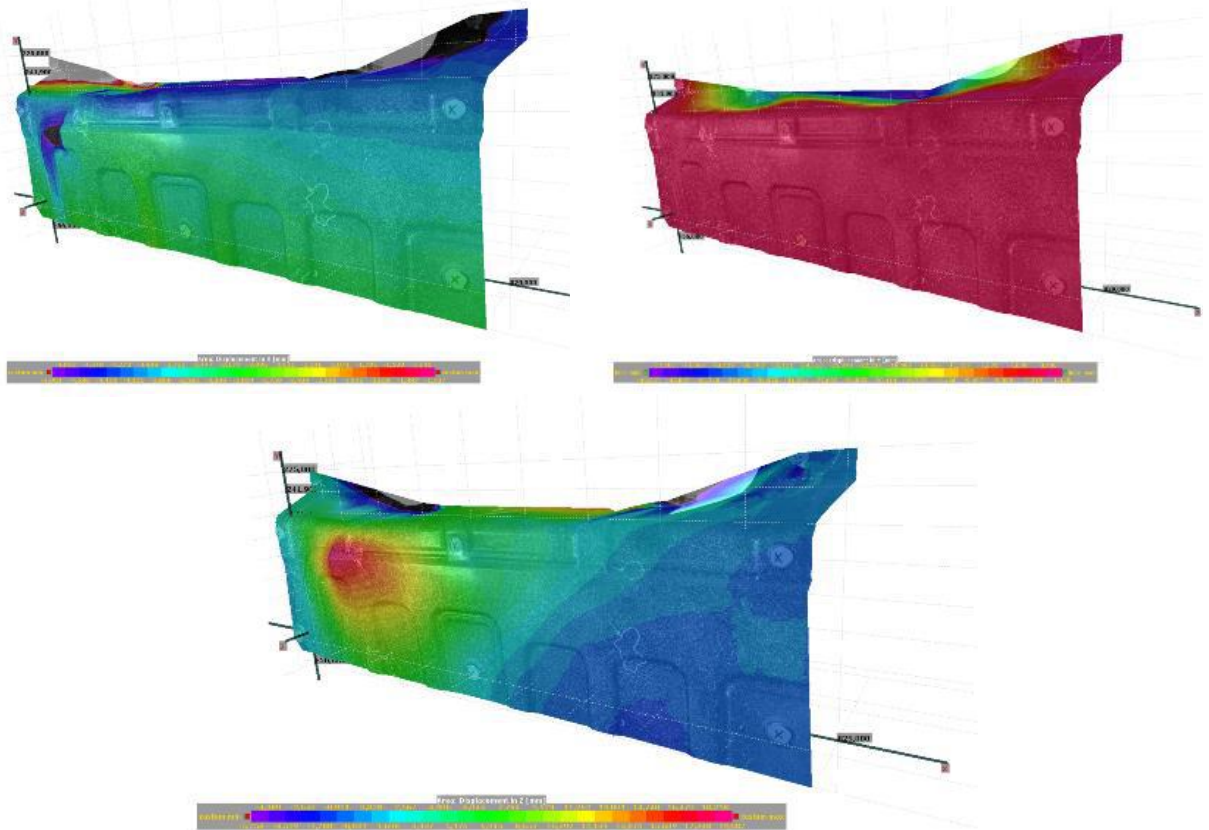
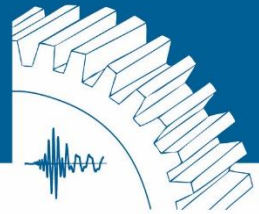
Line probe, evaluation strains [%]



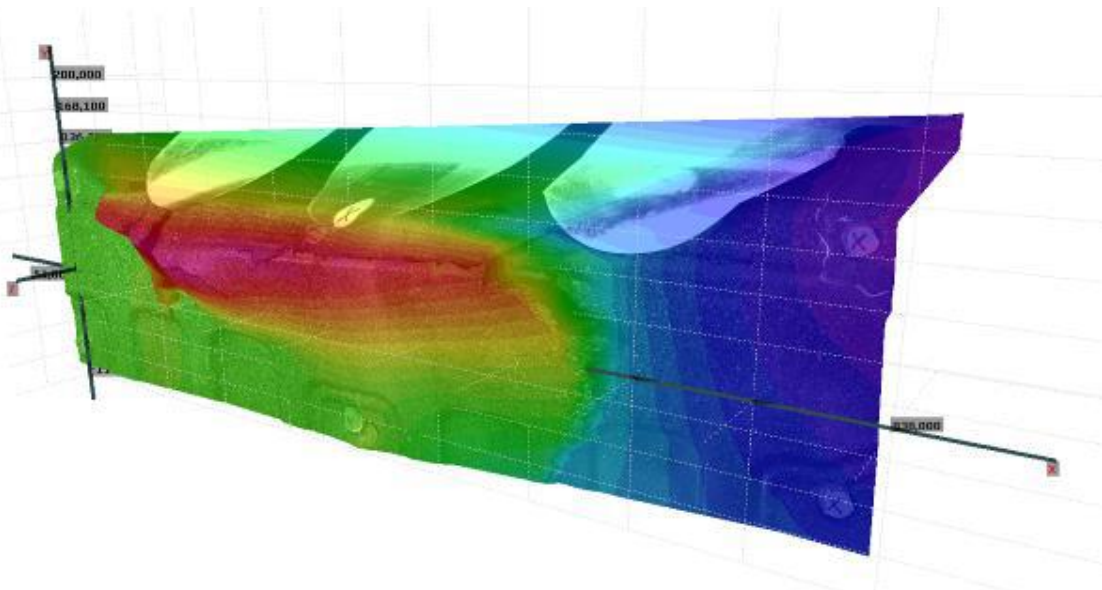
3D full field analysis Compression

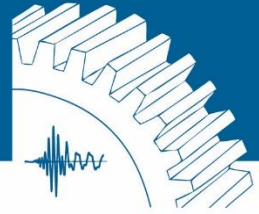


Although there were failures during the analyses of the surfaces, the necessary information was collected. The influences of the bolted connections and the internal installation parts could be verified. More detailed analyses were carried out for the cracks that occurred.



Analysis of bumping in 3D coordinate system





Many thanks, to Ing. Uwe Fülöp

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