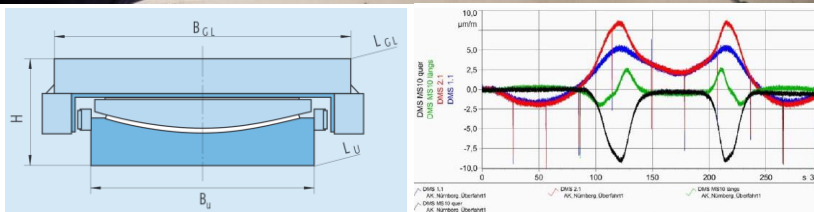


Master Thesis

Spherical Bearings with Measuring Devices for a Smart Bridge

Motivation

The Federal Ministry of Transport and Digital Infrastructure (BMVI) has started an experiment “Digital HighWay” on the A9, which includes the pilot project “Intelligent Bridges”. MAURER SE installed two spherical bearings, which can measure loads, rotations and displacements. Beside the observation of the functioning of the bearings, the devices should monitor the traffic loads, the changing in traffic loads and control the state of the bridge. From mid-October 2016 the bridge is in operation [2].



Task

The aim of this thesis is the processing of the experimental data obtained with the spherical bearings, by following the listed task:

- 1) Evaluation of the quality of the signal
- 2) Identification of the temperature influence
- 3) Identification of the signal parts due to traffic loads,
- 4) Programming of the algorithm for the separation of loads due to traffic from the loads due to self-weight
- 5) Programming of the algorithm for the computation of the bearing rotations and displacements
- 6) Comparison with computational results according to the statics theory
- 7) Computational methods for the simulation of traffic loads

A significant amount of measurement data will be made available. The thesis can be written in English or German and it will be carried out at [MAURER SE](#) in collaboration with the Chair of Structural Mechanics.

[1] <https://www.welt.de/regionales/bayern/article159480685/Was-die-erste-intelligente-Bruecke-Deutschlands-alles-kann.html>.

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