Einfluss von Fertigungstoleranzen auf die Lebensdauer
Influence of manufacturing tolerances on fatigue life estimation

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Abstract
The analysis of production-induced geometrical deviations on the operational strength result is becoming increasingly important in product development. An equally important challenge is the processing of measurements and the transformation into a CAE model, as well as the creation of new imperfect geometries. Since the reality can hardly be reproduced via classical, geometrically parameterized CAD models, a new approach is used by directly changing the nodes of the FE model. This requires a complete workflow, which starts with the parameterization of the geometry and extends over the stress calculation up to the operational strength analysis. The fundamental challenges here are the automation of the program sequences and the definition of the interfaces of the required programs in order to transfer data completely and correctly.

The lecture demonstrates the approach using an industrial example. This is where the entire calculation workflow is organized with ANSYS optiSLang® and the influence of the geometry deviations on the service life is evaluated and quantified. The mechanical calculation is performed with ANSYS® Workbench ™ 17, FE mesh variations are generated by Statistics on Structures, and the lifetime is evaluated with FEMFAT®.