Master Thesis

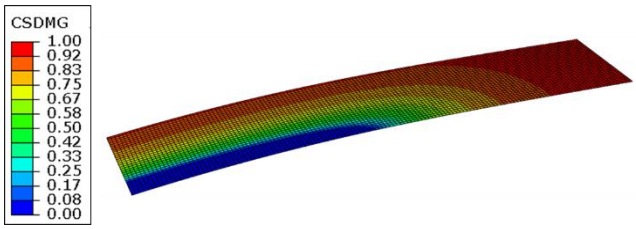
FE simulation of 3-Point-Bending (3PB) test for steel-ceramic laminates

Project Description

The multitude of possible properties and combinations gives steel-ceramic composites a high degree of flexibility. However, a major challenge is the identification of compatible materials for which the existing different shrinkage rate during the sintering process does not lead to production errors or undesired deformations. In practice, this identification of a defect-free manufacturable near-net-shape layered composite design is still frequently based on the "trial and error" principle, which results in a high failure rate and long development period. Therefore, there is a high demand for simulation methods that allow the prediction of deformation and manufacturability during the sintering process. Furthermore, it is necessary to accurately predict the thermal stress during co-sintering and residual stresses after co-sintering process in order to ensure the reliability of metal-ceramic laminates as structural components.

Tasks

- Determination of interfacial mode-I fracture energy of laminates based on the Double Cantilever Beam (DCB) test.
- Determination of the tensile strength of steel and the flexural strength of ceramic.
- FE simulation of bending test of laminates.



Requirements

- Interest in experiments and FE simulation
- Self-initiative and independent work

We offer

A comprehensive training and friendly work environment. A speedy conclusion of the work is desirable and supported with proper guidance from our side. The work may start immediately.

Contact

M.Sc. Chao Liu
Augustinerbach 4, Raum 216, 52062 Aachen Tel.: +49 241 80 96291, c.liu@iwm.rwth-aachen.de
www.iwm.rwth-aachen.de

Note: Hiwi position can be possible depending on the student's performance.