



SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS955

7 June 2019

A DCAMM seminar No. 742 will be presented by

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The title of the lecture is

Ductile fracture criterion and its calibration

Abstract:

Ductile fracture criterion is usually calibrated by shear, uniaxial tensile, plane strain tests. Stress-based fracture model is proposed in this study. It is observed that a nonlinear model with the mean stress shows a better correlation than the normal stress model. The shear point is very important to show the mean stress effect. However, it is often observed that triaxiality for shear specimen changes severely during shear fracture test and then the nonlinearity in triaxiality occurs. It is important to fabricate fracture specimens with minimum variation of triaxiality in order to characterize the ductile failure models accurately, where strain path is assumed to be linear. In this study, a “smiling” face shear specimen is optimized by minimizing the variation of stress triaxiality in the shear zone. In the optimization, Hill48 and Yld2000-2d (Barlat et al., 2003) criteria and Hill48 with non-associated flow rule are employed to model the anisotropic deformation of AA 6k21. The triaxiality plot for an optimized specimen based on Yld2000-2d is obtained experimentally. As an application, nonlinear strain path fracture including drawing, redrawing and expansion is presented. The proposed stress-based model with kinematic hardening shows excellent prediction of failure. Finally, simulation-based design of a long aluminum battery cell (AA 3003) with D&I is proposed for electric vehicle.

DATE:	Friday, 14 June 2019 2019
TIME:	14:00 – 14:45
PLACE:	Meeting room 121, Building 404 DTU, Technical University of Denmark

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Niels Leergaard Pedersen

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