



INTERDISCIPLINARY CENTRE FOR  
ADVANCED MATERIALS SIMULATION

MMM Seminar

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Tuesday, December 15, 11:00 a.m.  
ICAMS Seminar room UHW 11/1102

**Mechanisms and modelling of fatigue crack growth under  
combined low and high cycle fatigue loading**

The evolution of microcracks in a 10%-chromium steel is followed with the replica technique for pure low cycle fatigue (LCF) and combined LCF and high cycle fatigue (HCF) loading conditions. The superimposed HCF-cycles lead to accelerated fatigue crack growth rates, as soon as a certain crack length is reached. A mechanism based model is presented, which accounts for this effect and only needs one single fitting parameter. The model is used to predict fatigue lives at high temperatures and under thermomechanical fatigue loading conditions.