



Polymers and Composites Technology
& Mechanical Engineering Department

PhD POSITION

Topic: Multi-scale modeling of fatigue damage of continuous fiber reinforced polymer composites

Fiber-reinforced laminated composites have been used in many structural applications such as airplanes, ships and sports goods because of their superior specific properties compared to metallic materials. Typical damage behaviors in the laminated composites are transverse microcracking, fiber-splitting, fiber-breakage and delamination. The damage is complex to study due to the fact that the ultimate failure results from interactions between the different types of damage occurring at different scales (micro-meso-macro).

The main objective of the thesis is to develop and implement a direct method (potentially more economical than a step-by-step analysis) to predict the damage state reached by a fiber reinforced polymer component under variable repeated mechanical loads. This method will be based on a multi-scale modeling approach, building from predictive micro-scale models to component level analyses. The micro-scale models of initiation and damage evolution will be validated by mechanical tests coupled with SEM observations.

Successful candidate for this position should have a master degree in Mechanical Engineering along with strong background in one or several of the following areas: Finite Element Method, C++ Programming language, composite material.

Interested candidates should submit detailed curriculum vitae with the name and address of one referee, and a cover letter to Dr. Ing. S. Panier before **30th june 2009**.

Partnership: Institut für Allgemeine Mechanik, RWTH Aachen, Germany

Net Salary: 1400 €/month (1st year), 1500 €/month (2nd year), 1600 €/month (3rd year)

Starting date: November 2009

Contact

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