

Half-time Seminar

Time-dependent failure of fiber networks: Uncertainty of lifetime

Amanda Mattsson

Department of Chemical Engineering
Mid Sweden University

Abstract

Uncertainty is the greatest challenge when designing materials used for load-carrying structures. The lifetime of materials subjected to stresses over time is known to exhibit large variability, e.g. a coefficient of variation of 100% or more. The fundamental reason for the lifetime variability is that the material always has a small probability of failure with time. This probability grows with time and increases with stress, which in turn is influenced by the material structure. This interplay is the essence of the complexity. We have performed Monte Carlo simulations of the failure of a fiber network and established links between fiber characteristics, network structures and lifetime variability. Such information is essential for minimizing uncertainty and increasing the safety of materials and structures. We have also performed extensive experiments on containerboard (used in corrugated board structures) in order to determine crucial material parameters, and evaluate the potential of cellulosic materials for light-weight structural composites.

When: December 4 2017, 11:00
Where: Mid Sweden University
campus Sundsvall lecture hall M207

Welcome!



PART OF  MID SWEDEN UNIVERSITY

