

MASTER

THESIS

FUNGI MEET MECHANICS

COMPRESSION BEHAVIOUR OF ENTANGLED HYPHAE NETWORKS

Tree fungi are strong but light-weight biological materials. Microscopically these fungi consist of fiber-like cells which build an entangled and branched network. This network forms a honey-comb-like structure in the sub-millimeter range, with tubes aligned in one axis.

The compression behavior and failure mechanism of samples in the millimeter range should be investigated. For this a set-up for micro compression testing will be used in combination with light microscopy.

The observed structural behavior of the samples shall furthermore be described by mechanical modelling, e.g. based on engineering mechanics in combination with classical laminate theory.

Thus, initially suitable geometric models shall be developed on different length scales to capture the principal mechanical response under compression. The models shall furthermore allow for (geometrically) nonlinear phenomena in order to potentially adjust to the failure mechanisms observed in the experiments.

Decent knowledge of mechanical principles is essential.

The scope and focus of the work can be adjusted according to interest.



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