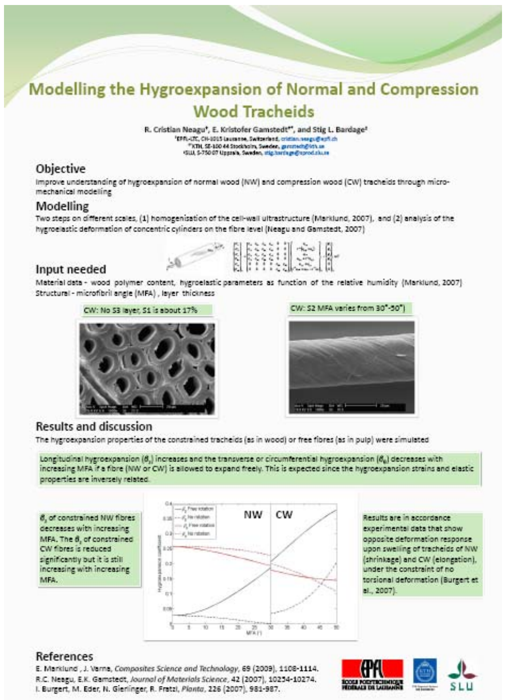

Modelling the Hygroexpansion of Normal and Compression Wood Tracheids

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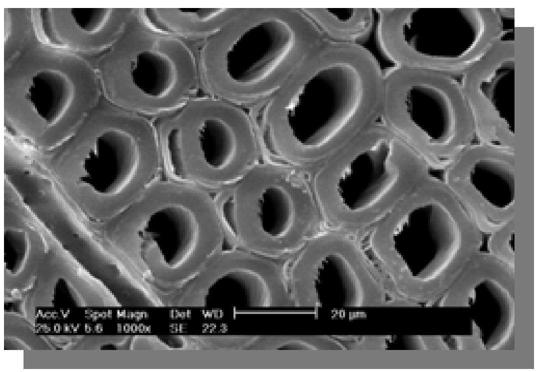
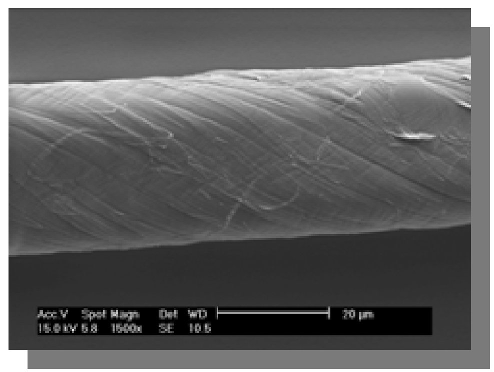
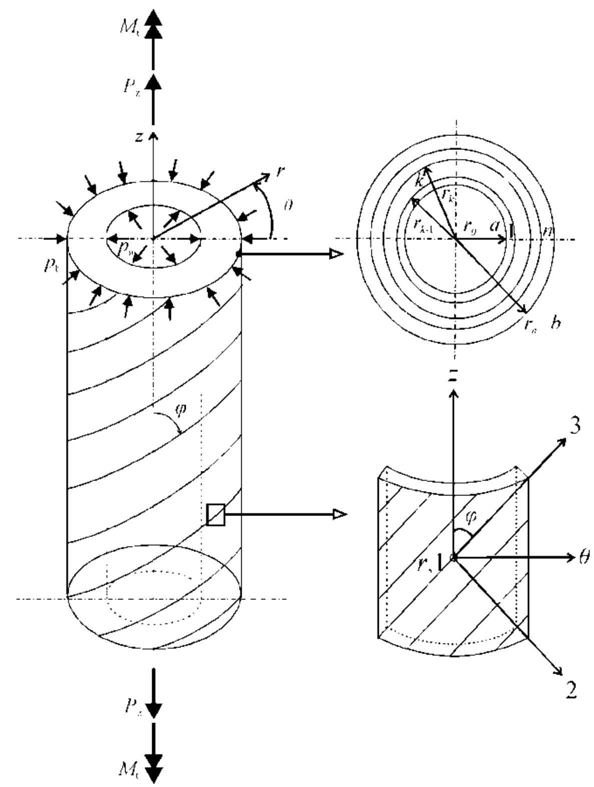
Composite micromechanics

CW: No S3 layer, S1 is about 17% of the cell wall thickness with a MFA of 90° while S2 MFA varies from 30°-50°)



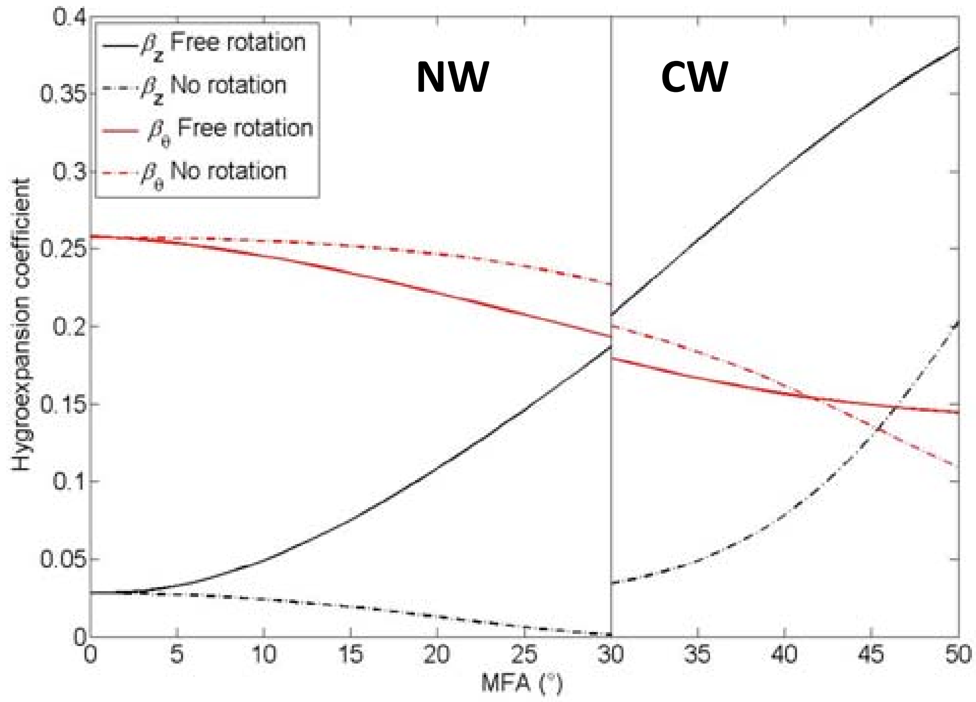


3D framework, combining a homogenization method (layer level) and exact elasticity theory (fibre level)



NW: MFA in S1 = 90° and constitutes 9% of the cell wall thickness, S2 MFA from 0°-30° and thickness fraction of 88%, S3 MFA is -75°)

Hygroexpansion behavior



Also experimental data that show **opposite deformation response upon swelling of tracheids of NW (shrinkage)** and CW (elongation), **under the constraint of no torsional deformation**.