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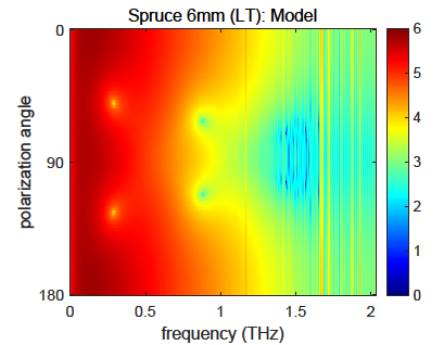
Empa is the research institute for materials science and technology of the ETH Domain and conducts cutting-edge research for the benefit of industry and the well-being of society.

The Laboratory for Transport at Nanoscale Interfaces has an opening for a

**PhD student in terahertz spectroscopy and imaging of key properties of wood**

The project involves three key aspects in terahertz (THz) technology for the understanding and characterization of wood properties:

- (i) THz radiation is very sensitive to humidity and water. Due to the different spectral properties of water compared to those of the cell wall polymers it allows for a spatially and temporally resolved measurement of water content and water diffusion in wood.
- (ii) As the anisotropic optical properties of wood and cellulose strongly correlate with the cellulose microfibril orientation, THz radiation is an excellent medium for probing the spatial microstructure of wood relevant to mechanical properties.
- (iii) Internal stress in a material may result in anisotropic optical properties. We presume that we can correlate changes in optical anisotropy at THz wavelengths with stress changes in wood.



*Birefringence in wood*

To address these aspects, the PhD student will develop and carry out new THz spectroscopic experiments including automation (LabView) as well as data evaluation (Matlab) and contribute to modeling optical properties of the multi scale wood structure.

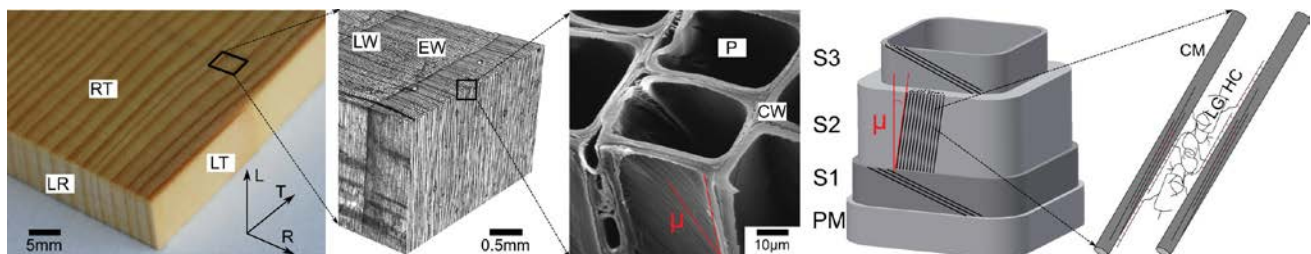
We are looking for a highly motivated PhD student with a background in physics, optics, wood science or a related discipline, with a strong interest to work in an interdisciplinary research environment. Programming skills in Matlab and/or Labview are highly advantageous. Excellent communication skills and fluency in English (both written and oral) are mandatory, basic oral expression skills in German are desirable.

The research is performed at the Laboratory for Transport at Nanoscale Interfaces in collaboration with the Applied Wood Laboratory at Empa and the Wood Materials Science Laboratory at ETH Zürich. The work will be carried out under the joint supervision of Dr. Peter Zolliker ([Transport at Nanoscale Interfaces](#), Empa), Dr. Markus Rüggeberg ([Applied Wood Materials](#), Empa) and Prof. Ingo Burgert ([Wood Materials Science Laboratory](#), ETH Zürich). The position is funded for up to 4 years by the Swiss National Science Foundation. Earliest possible starting date is July 1, 2018.

**For further information** about the position please contact Dr. Peter Zolliker, [peter.zolliker@empa.ch](mailto:peter.zolliker@empa.ch) or Dr. Markus Rüggeberg, [markus.rueggeberg@empa.ch](mailto:markus.rueggeberg@empa.ch).

**We look forward** to receiving your online application including a letter of motivation, CV, diplomas with transcripts and contact details of two referees. Please upload the requested documents through our webpage. Applications via email will not be considered.

Empa, Patricia Nitzsche, Human Resources, Ueberlandstrasse 129, 8600 Dübendorf, Switzerland



*Hierarchical structure of wood*