FORCED WATER FLOW IN WOOD
STUDIED BY LOW FIELD MAGNETIC RESONANCE IMAGING

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Wood is an example of inhomogeneous porous medium. Its properties can be studied by observing the water flow through it. A method was developed to image the water flow in wood using a low field magnetic resonance imaging (MRI) system \cite{1}. Cylindrical samples, 8 cm long, 5 cm diameter, were cut either parallelly or perpendicularly to the principal anatomical direction of the wood fibers. Each sample was inserted into a cylindrical plexiglass tube and sealed by paraphine. The tube was filled with water on one side and evacuated on opposite side, in order to improve the efficiency of the flow. Samples of oak (\textit{Quercus L.}), spruce (\textit{Picea}) and fir (\textit{Abies}) trunks were studied. In all samples, the images show a formation of narrow liquid paths in wood, in which the water flow is much faster than the diffusion driven moisture transport \cite{2}. The water flow velocity profile along the sample was determined by the digital image analysis.

References: