

**Evaluation of properties of wood for multiscale modeling of instantaneous and time  
dependent response**

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Regular wooden structures are subjected to mechanical damage partly caused by time dependent deformation (e.g., creep). Consideration of those impacts is important for wooden heritage funds during their preservation. The Vasa warship is one of the greatest examples. To understand the time dependent deformations of the ship, we need to simulate the instantaneous and time dependent response of the wood material using analytical methods. A multiscale modeling approach would give us the overview of the whole structural behavior of the ship. For reliable simulation of the timber structures, accurate measurements of the elastic and yield properties of the wood members are necessary. In this project, a digital image correlation system has been used to evaluate the surface strains of oak samples from the ship. Influence of barreling and unevenness of the sample planes has been observed in the measurements. After completion and validation of the model, the gathered data can be used in the process of developing a new support structure for the ship.

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