

# Impact of moisture content changes on the mechanical behavior of *Pseudotsuga Menziesii*

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One of the main objectives of this project is to set up an experiment and a numerical model using cast3m software, taking into account the effect of climatic variations, initial defaults of Wood and the deferred loading of wood structures. The results obtained during the first experimental phases will be presented, especially the mechanical characterization tests carried out on a notched beam made of *Pseudotsuga Menziesii* Franco wood, loaded in variable climate (outdoor creep) focusing on the influence of variations in the moisture content (MC) of the beam on the opening of the crack and the evolution of the deflection [1-2].

The curves show the effect of MC variations on the damage of the beam. Indeed, there is a correlation between the peaks of the crack opening curves D6A and D6C (figure 1a) and the MC peaks especially at 1200-1800-2100 hours. Figure 1b shows that for an increase in internal humidity there is an increase in deflection. It seems clear that there is a strong link between the reduction of the lifetime of a wooden structure, such as our notched beam, subjected to a constant load and MC variations. For future work, particular emphasis will be placed on the combined action of climatic variations and initial defects over the lifetime of the structures under test. The experimental results obtained will allow us to propose a numerical mechano-sorptive model taking into account the effect of climatic conditions, coupled with the initial defects of wood on the behavior of wood structures, using CAST3M software.

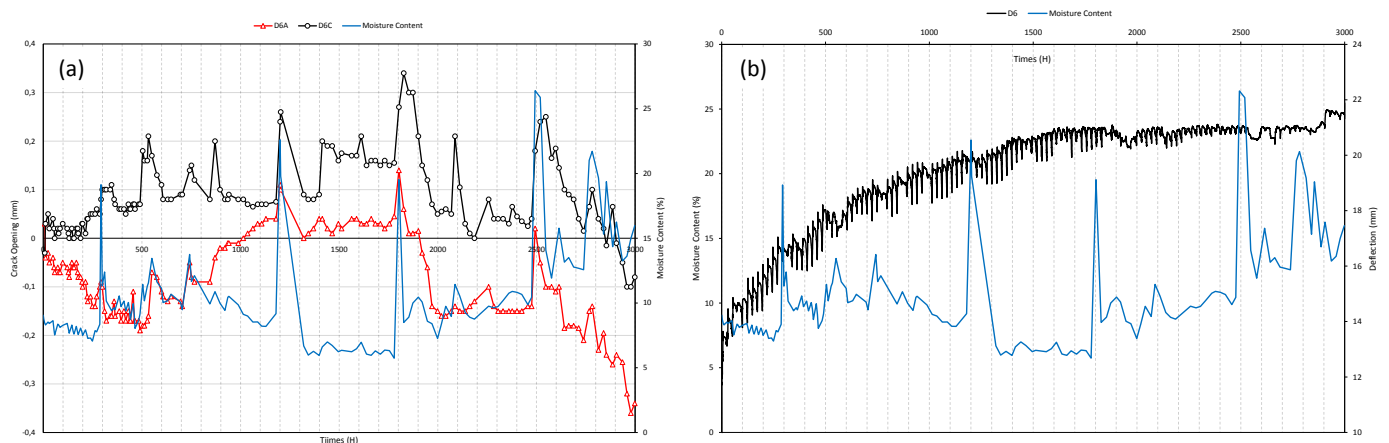


Figure 1: a) Crack opening vs moisture content in the time. b) Evolution of deflection vs moisture content

## References

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