



Aalto University
School of Engineering

Experimental investigation of glued laminated timber beams under bending load

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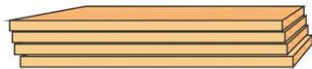
GLT beams



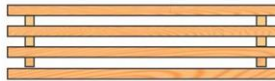
- ✓ GLT is an engineered wood product composed of several layers of timber boards glued together.
- ✓ Mechanical properties of GLT beams are highly related to the timber boards which are used for the fabrication.

This project aims to improve GLT, in terms of reliability and efficiency

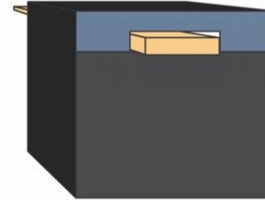
GLT fabrication



Structural Timber



Controlled drying



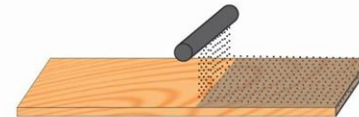
Strength grading



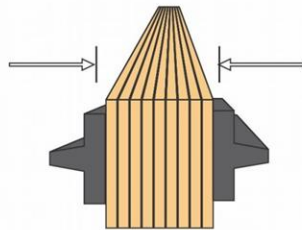
Finger Jointed



Planed



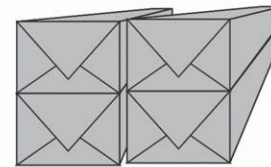
Adhesive application



Pressing and cutting



Planing and finishing



Packing and delivery

Knot cluster and finger joint (FJ)

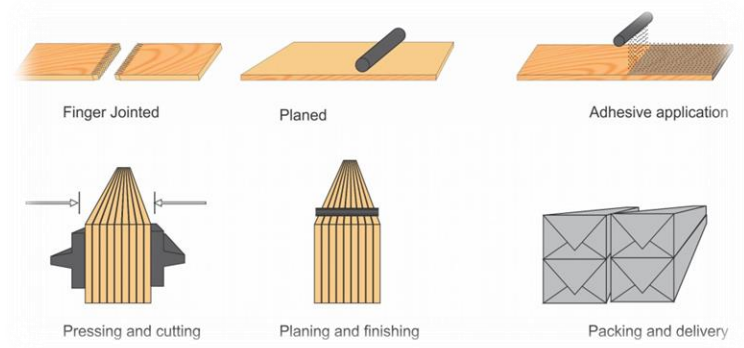


Research field gap

Process of timber grading



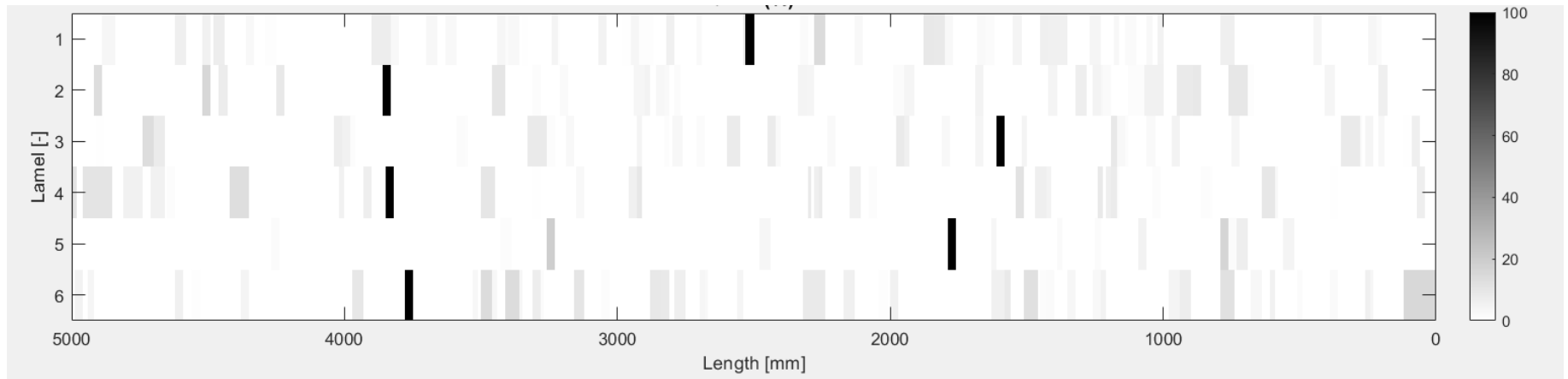
Process of GLT fabrication



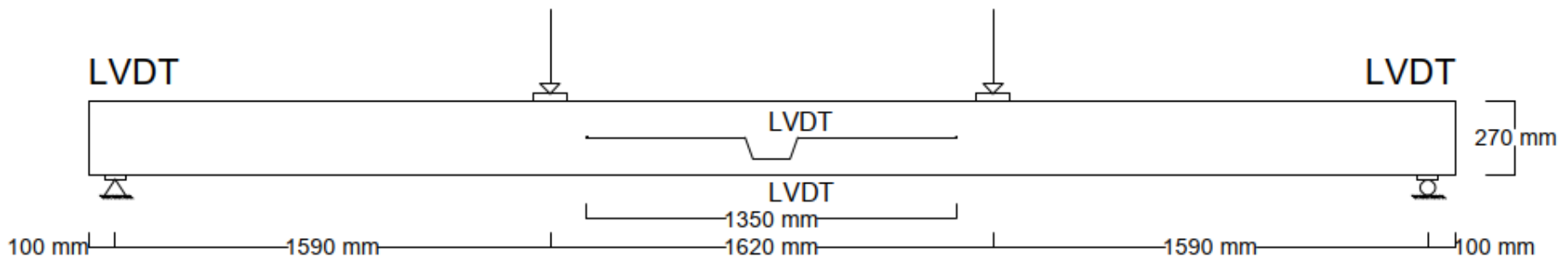
Improved
GLT can
be gained

Accumulations of local weak
sections (knot clusters and FJ)
can be avoided

Objective: identification and quantification of the major strength reducing arrangements of FJ and timber boards.

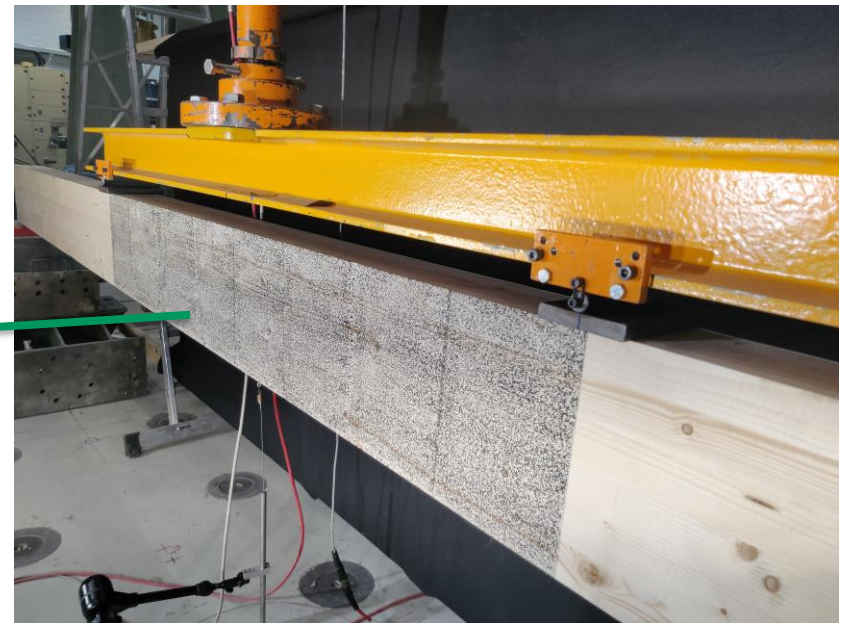
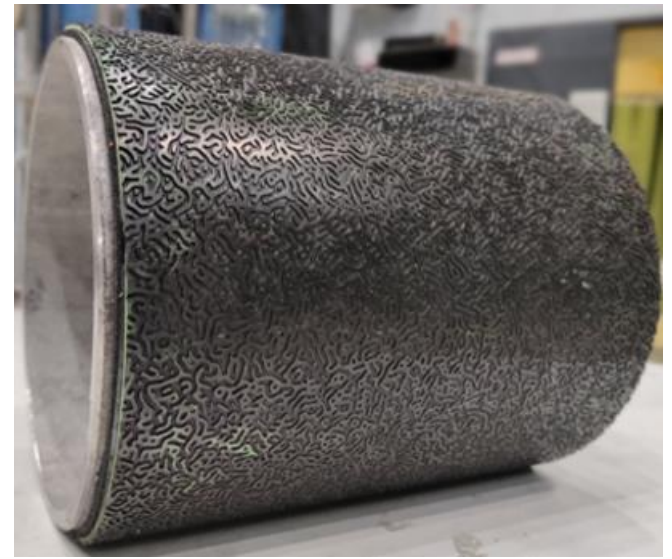


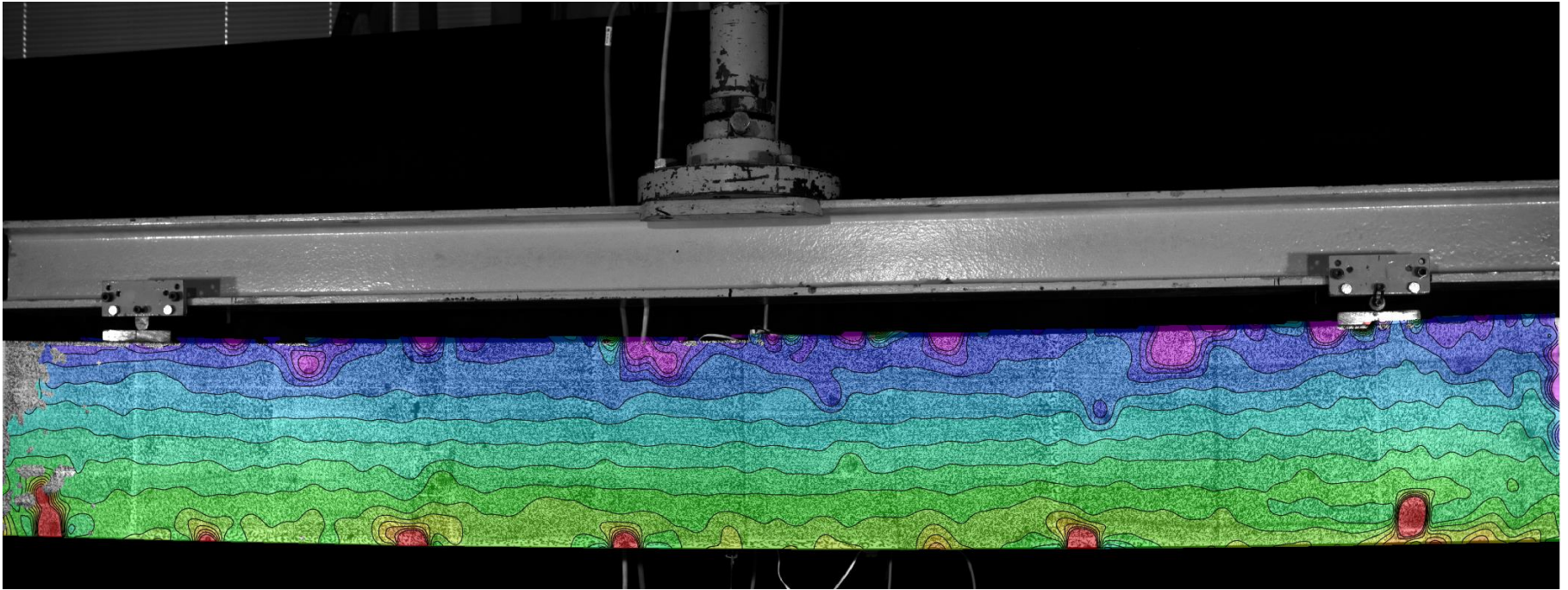
- 22 GLT beams in structural size (5m) with well-known setup are tested.
- The experiments are according to EN 408.
- The test results will be used to validate numerical and probabilistic models.
- For the test measurement, stereo digital image correlation (stereo DIC) method is adopted which allows to investigate lamination effect on FJ and knot mechanical behavior.





- Worm speckle special patterns are used.
- Rubber stamp is used to apply the pattern.





Longitudinal strain distribution, knots experience/exhibit strain concentrations



Thank you

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