

## **Experimental investigation of scarf joint of ‘lightning sign’ in bending**

**Abstract** The paper presents a description and results of the research concerning one of the scarf joints, so-called ‘lightning sign’ (also described as ‘Bolt of lightning’ or ‘Trait-de-Jupiter’). This joint has been used and can be commonly found in wooden historical structures and is considered to be an interesting example of carpentry longitudinal joints. Wooden beams with this type of joint **shaped in different planes: horizontal and vertical reinforced using spindle fasteners (metal screws) were subjected to four-point bending tests**. As a result, the static equilibrium paths and the bending capacities of individual beams were obtained. They were compared to the load-bearing capacity of the continuous reference beam. Also a simplified numerical analysis based on FEM was carried out with comparison the rigidity of individual beams. A comparison of the results for particular series of beams is presented and some conclusions and possible directions of the future actions in the subject are presented.

**Key words:** carpentry joints, scarf joints, joint of ‘lightning sign’/ ‘Bolt of lightning’/ ‘Trait-de-Jupiter’, experimental research, bending tests