EXPERIMENTAL MODULE

First results of experimental module

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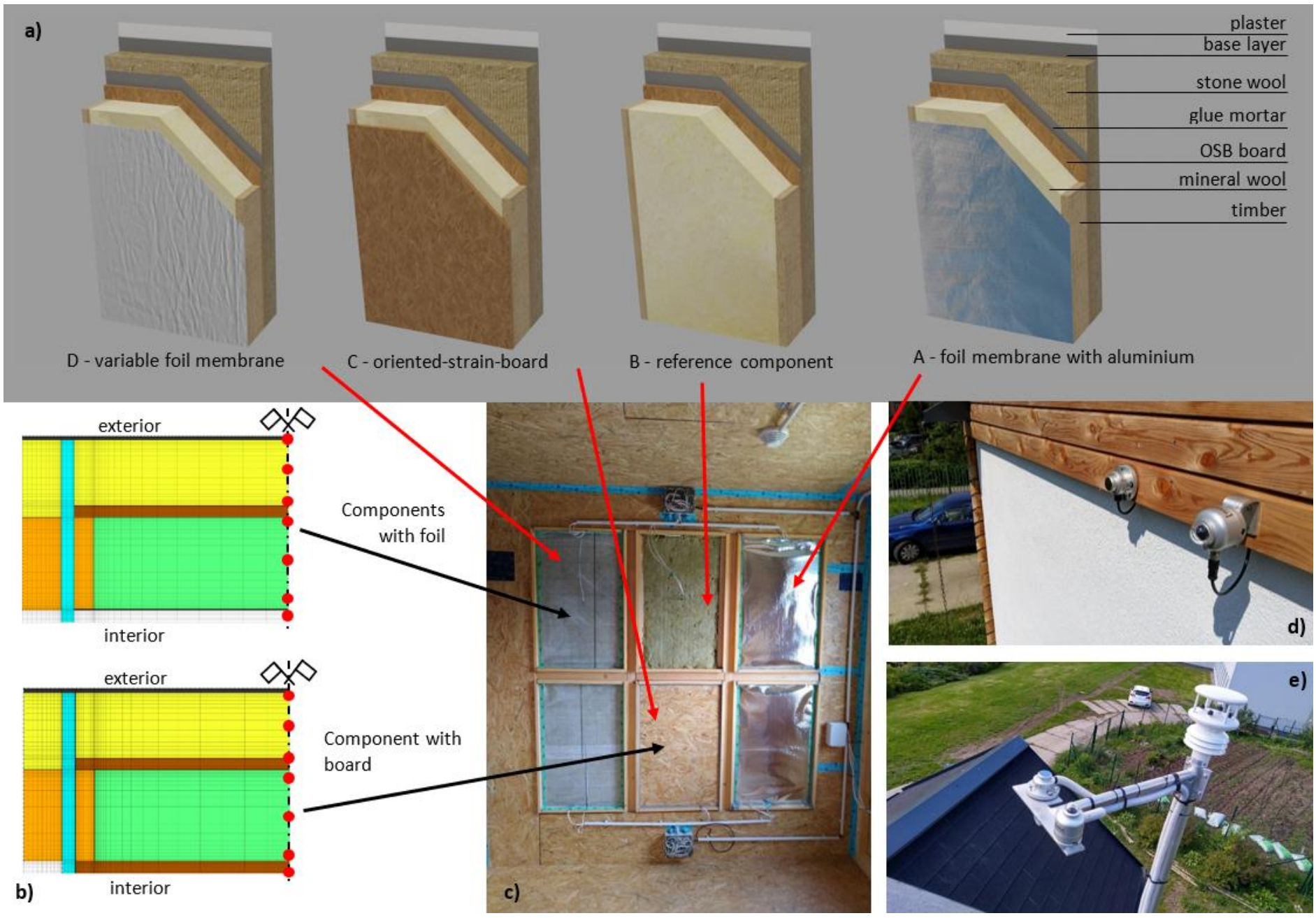
First part of the project research is focused on hygrothermal analysis of experimental walls with different material composition. It is well known that temperature and moisture strongly influence safety and durability of building components especially in wooden components. Theoretical analysis of timber walls and short-term laboratory analysis are known in literature. Presented research is based on full scale experiments and comparison of results with numerical modelling. Long-term measurements are delivering interesting information about development of moisture and temperature. Review reports a small part of data collected from the first year of measurement. An east-south experimental wall with six test walls is presented.



Research is focused on the moisture regime of components with similar composition and different vapor barrier on the internal side. An experimental wall has six test components. One component works as a reference without any vapour barrier. Oriented-strand board like typical material for vapour barrier in timber components is used in the second model. The third model implements a foil barrier with variable diffusion properties. Last model has traditional foil with an aluminium cover. Each composition is equipped with several sensors at material's intersections. Sensors are measuring temperature and relative humidity. External space is monitored by complex weather stations and test facade monitors shortwave and longwave radiation. Internal space is maintained by a venting unit with heat recovery and heat pump. Data is obtained each two minute and the first period is shown by Fig. 2. Further works on walls' research will be focused on material characterisation in hygrothermal laboratories. Each used material will be described in detail for hygrothermal modelling. Measured results will be compared with numerical models which prove models' accuracy and their sustainability for timber components. Next periods on the experimental module will be focused to run other experiments, improving and development of sensing systems. Next moisture sensing system will be developed and added to wall components. Experimental roofs will be equipped with sensors for investigation of hygrothermal performance with relation to sky undercooling.

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