Technical Session VII: Building Physics.

Chair: Guy NEWSHAM (CANADA)
Co-chair: Ken-Ichi KIMURA (JAPAN)
Reporter: Hugo HENS (BELGIUM)
Secretary: Marijke MOLLAERT (BELGIUM)

Laboratory tests are both more expensive and more time consuming than computer *simulations*. (G. NEWSHAM).
It is clear that the *software packages* are easier to use than the *equipment in the laboratories*. But *experiments* on real life systems show that phenomena are going on which are not correctly modelled in the *simulations*. Small imperfections can be important but can not be modelled before the building is constructed. (H. HENS). The performance factors of *real buildings* need to be measured in the *field*. A continuous loop from *computer models* through *lab tests* and *real building measurements* back to the *simulations* needs to be performed. (J. STRAUBE).
To know the real phenomena better testing is required, but on the other hand the stochastic approach can be used to integrate uncertainties within the simulations. (S. HOKOI).
The best research results are obtained if both *simulations* and *experimental tests* are put together. (K.-I. KIMURA).
In the universities teaching is less and less based on laboratory testing, although students should learn about how plants work on site and the real problems. (M. HOLMES). There is a problem of resources: running simulations can be done in a small room, extensive laboratory tests require more support. (J. WRIGHT). Student's contacts with the engineering firms should be improved. (... South Africa).
From the design viewpoint, simulation is mostly the only thing available to the designer. (M. HOLMES). Design frequently occurs under time pressure, and in these circumstances simulation tools can guide the designer to an appropriate solution. (H. HENS).
Reduced models can be used for the optimisation of some of the components or for specific aspects. (J. BRAU). For the natural ventilation in humid climates a lot of openings in the envelope of the building are required. The *validation* of the performed simulations in the constructed buildings remains necessary.
Humidity is part of the HVAC system. Water can degrade porous materials. (G. NEWSHAM, H. HENS).
Dynamic simulation of *moisture* transport still is a problem. (A. MELOKOV). The uncertainties about the input data can be 100%. (M. HOLMES). Moisture in the walls can completely change the temperature and the required cooling. Papers related to this topic are 18, 236bis, 304.
In the future designers will concentrate on other ways in combining materials. A *passive* envelope improves comfort without changing its components, within an *active* envelope components can change (transparency of the glass on or off) or move. (B. TODOROVIC). The active use of two skins (air can actively move between the inside and the outside skin) can improve comfort, can control the *solar gains* and improve *acoustic isolation*. (H. HENS).
Low energy houses, mechanically ventilated and well isolated can cause *acoustical problems*. (G. BRUNDRETT).
Strategies related to the different aspects of comfort (thermal, humidity,..) need to be built up. The different (sometimes conflicting) aspects need to be integrated to obtain a *well balanced construction rationale*. (H. HENS).
Also the impact of the building on the *environment* needs to be part of it. (A. MELOKOV).
Building physics should remain the essence for the architect's art of construction. (K.-I. KIMURA).

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