

## **Synthesis of the discussion of Session 8 : Experimental methods and model validation**

The discussion focused on two problems : the model validation and the need for good weather data (especially for the wind speed and direction).

The questions related to the first problem were dealing with the way to validate physical and black-box models and with the type of data required by the simulation user.

When validating physical models, care should be taken to check the accuracy of the outputs of the models, but also to evaluate the quality of the fundamentals "implemented" in the models. On the other side, when validating black-box models, care should be taken to dissociate the model calibration (or, in other terms, the parameter identification of the model) from the model validation : the model validation should check the accuracy of the model for operating points different from the ones used for calibration.

The type of data required by the simulation user depends on the purpose of the use of the simulation. In design stage of the HVAC equipment, a lot of decisions must be taken quickly and the simulation user will not have the possibility to handle a lot of measurement data; on the other side, in the operating phase, when simulation is dealing with control, the need for numerous and high-quality measurement data is much more important.

Such as for the models, the quality of the weather data is also influencing the accuracy of the simulation. The data related to the wind speed and direction could certainly deserve a greater attention. Indeed, to make realistic prediction of the natural ventilation in building, good wind-related data are required. When applying CFD tools to calculate the wind pressure on the building facades, good wind-related data are also needed to catch correctly the boundaries of the CFD problem. However, the problem of getting good wind-related data is not only a problem of measurements, but, such as for the solar radiation data, it is also a problem of statistics. Indeed, the wind-related data should be representative on long time periods. Unfortunately, it is very unlikely to get wind-related data allowing short-term predictions.