DYNASTEE DYNamic Analysis. Simulation and Testing applied to the Energy and Environmental performance of buildings

Free On-Line Training Webinars; 22 and 29 September, 6 and 13 October 2021

# *Dynamic Calculation Methods for Building Energy Performance Assessment*

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https://DYNASTEE.INFO website

Network for

- DYNamic
- Analysis
- Simulation and
- Testing of
- Energy and
- Environmental performance of buildings

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# DYNASTEE - OBJECTIVE

- Global leading network on dynamic testing and evaluation of Energy Performance in Buildings
- Consolidation of existing knowledge
- Bringing together academic, industry and governmental experts
  - on the **test environment and experimental setup** as well as on the **data analysis** and **performance prediction**.
- DYNASTEE - NoE: ST5 of IEA EBC Annex 71



# TRAINING OBJECTIVES

**Background to Course**

The course has two main objectives:

- Train a dynamic methodology to assess the thermal performance of a building such as a wall, and a whole buildings' performance.
- Examine and understand the performance of nZEB and renewable energy technologies in built environment

The approach to these will be a combination of **building physics, applied mathematics** and **statistical methods**

# Overall Topic of Sessions

- Building physics to support the development of mathematical models for energy performance assessment.
- Knowledge of thermodynamic processes, heat transfer and the impact of solar radiation.
- Thermal conduction, convection, radiation and thermal mass.
- Using benchmark data for analysis
- Complexity of the physical process and how to translate the available information in mathematical models,
- Importance of model simplification of building physics represented by measured signals.
- Variability of the environments and the uncertainty of data
- Measured data and not-measured phenomena and how to build a mathematical model based on the available input.

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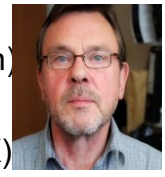
# The Experts



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# PRESENTATIONS

General

- Introduction to general approach of different analysis techniques used to perform the thermal characterisation for elements (walls, roofs etc) through to the whole building.
- Two software tools have been introduced that could be used during series of webinars; LORD, and CTSM-R. An easy exercise is available given with the correct result that may help you to build confidence in your analytics skills
- Introduction to measured data, specific sensors for buildings physics and energy performance and what is important to know about building physics, sensors and instruments
- The experimental set up and measurements at the Plataforma Solar de Almeria (PSA)has been presented, an explanation and demonstration of the data available have been given. Data series 16-17 have been presented.



# PRESENTATIONS

Data that can be used be the participants *is available at the website dynastee.info;* zipped folder PSA_RRbox_DataSeries20

- An exercise that will allow of a study to be analysed with and without solar radiation.
- An introduction to dynamic analysis methods specifically LORD has been will provided
- A practical demonstration has been given of the software tool LORD on the PSA data series 16 and 17
- Introduction to discrete time and continuous time methods and how to use CTSM-R with statistical tools .
- Demonstration of the CTSM-R software applied to PSA data series 16,17.
- An introduction to the analysis of metering data, the specification and limitations of the data and analysis techniques.

# CONCLUSION

"One needs a certain level of skill to perform well"

- Improve knowledge through a Training and Competition
- After >25 years DYNASTEE states:

**Training make sense**



# CONCLUSION

- These webinars have been attended by 26 people
- Improve your knowledge and your skill through a Competition
- DYNASTEE investigates the organization of such a Dynamic Analysis Competition
- Could be whole building energy performance assessment based on metering data and/or real measurements

# Future; 2022

Last year is atypical; the decision was made to postpone the complete Summer School for good reasons and substitute it by a series of webinars

However we are already planning the next summer school to take place in Almeria in Spain in 2022, this will be a full Summer School with classroom-based learning sessions and interactive sessions.

# Future; 2022 and beyond

We will be using the forthcoming year to work on new topics for the summer school as follows:

- **Use of online data platforms such as weather API, renewable energy data**
- **Use of on-board systems such as connected thermostats**
- **Use of smart metering data for energy input**

Most countries now have access to at least most of these data, and some, all of it.

- The work and findings of IEA Annex 71 which focus on the data mentioned above to deem the energy performance of a dwelling. https://dynastee.info/new-iea-ebc-annex-71-building-energy-performance-assessment-based-on-in-situ-measurements/
- We will provide learning on not only the acquisition of this data using live API access to smart meter and controls, but the analytical tools to deem the energy performance.

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# THANKS TO

**Webinar management**

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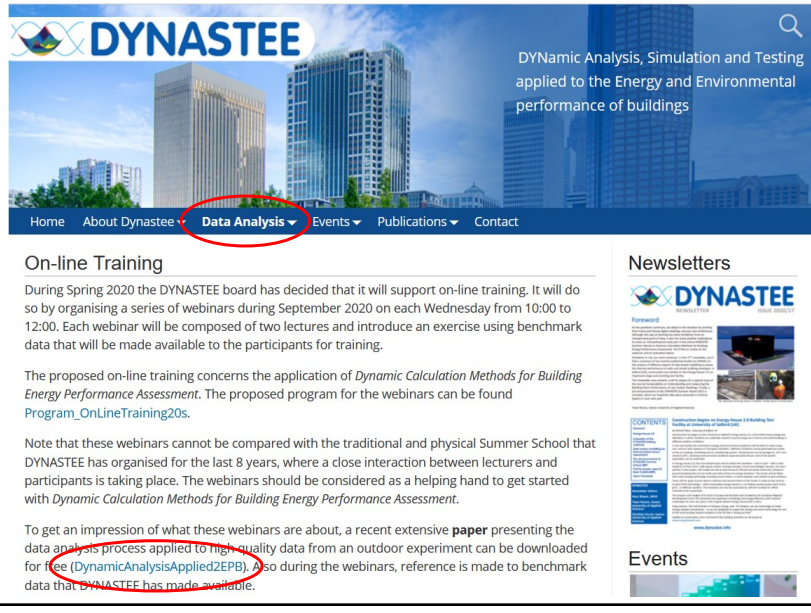


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