

DYNASTEE

NEWSLETTER

ISSUE 2023/20

Foreword

Last April, the DYNASTEE Spring School on Building Performance Measurement took place at the University of Salford (UK). We were happy to organise a physical training event again after two years of webinars due to the pandemic. Although those webinars attracted many participants and were valuable in their own right, we have found that the interaction between participants and lecturers, and participants of different (building physics and statistics) backgrounds is essential in developing the skills to do proper data analyses. We'll continue with our training events, the next being the Summer School 2024 in Almería (ES). You'll find an announcement of the summer school in this newsletter.

At the end of the summer school, the DYNASTEE European Building Performance Symposium was held, in which the latest legislation, technologies and methods for building performance measurement were covered (see the article on page 2). We aim to do another symposium next year.

For our next Newsletter, we welcome articles on research results of building performance measurements and simulations, as well as updates on assessment methods, training events and test sites. Send us a message if you are interested.



Sunset in Almería



University of Almería Campus

Twan Rovers

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SPONSORSHIP ANNOUNCEMENT

Would you like to see your company logo and details in our newsletter? DYNASTEE is calling for new sponsors.

More details can be found on the sponsorship leaflet which can be obtained by emailing aimee.byrne@tudublin.ie

Summer School 2024 in Almería, Spain, 11-18 September 2024

Whole building energy performance assessment. From in-situ measurements to smart metering data.

After nine Summer/Spring Schools and two training Webinars, DYNASTEE is proud to announce that for the tenth time it will organise a physical Summer School in 2024. More than 190 PhD students and researchers have participated in the nine preceding physical Summer/Spring Schools and their enthusiastic response has made us decide to continue organising this dedicated course.

Course Schedule: The course will be 6 days with 3 days - weekend - 3 days. The aim of the Summer School is to train the participants on the application of analysis techniques towards whole building analysis from in-situ measurements and metering data. New is the introduction course on metering data and a dedicated exercise by applying statistical analysis methods to metering data. Three days will be devoted to linear regression and discrete time methods by applying the user friendly software tool LORD. After the weekend, 3 days will be devoted to continuous time methods to like CTSM-R and applied to high quality real data. The course concept will remain the same as in previous years, which means about half of the time is devoted to lectures and the other half to performing exercises using benchmark data. This schedule leaves a weekend between the first and second parts of the course that the participants can use to dig into the training material or just to have a rest. A social event will be organised during the break.

Dates: 11 - 18 September 2024. Note that the Summer School will end on Wednesday 18 September at 17:00.

Venue: CIESOL at the University of Almería, Spain. Almería can be reached in different ways. The most common travelling option is to fly to Madrid or Barcelona and then to change for Almería. It is also possible to fly to Malaga or Granada and then take a bus to Almería.

Fee: The fee covers presentations and data of the lectures and relevant papers, lunches and coffee breaks during the lectures, a joint dinner and participation to the social event during the weekend. Details of the announcement including the participation fee will be soon available on the [DYNASTEE website](https://www.dynastee.info).

For pre-registration please contact Marta Ruiz e-mail: mr Ruiz.servicioexternos@psa.es

Feel free to contact mjose.jimenez@psa.es to be placed on the mail-list and you will receive updates of the announcement.

Deadline for registration: 15/06/2024

Accommodation: Upon request, the organisers can facilitate information on student residence and standard hotels in Almería.

Lecturers: Hans Bloem (Dynastee), María José Jiménez (CIEMAT, ES), Peder Bacher (DTU, Lyngby, Denmark), Aitor Erkoreka, Irati Uriarte (University of the Basque Country, ES) and Richard Fitton (Salford University, UK).

www.dynastee.info

About the Spring School 2023 at the University of Salford, 24-27 April

This analysis training event was a condensed format of the regular Summer School, which has been organised for over a decade and which has attracted over 200 participants. Lectures have covered important aspects of dynamic data analysis applied to real data from in-situ measurements.

After two years of webinars, we were happy to be able to organise a 4-day physical training event again. We have found that the interaction between participants and lecturers, and participants of different backgrounds is essential in developing the skills to do proper data analyses, which is much more difficult in an online setting. Doing analysis exercises brings up a lot of questions by the participants that can be responded immediately by the available lecturers. The programme therefore was organised in such a way that about half of the time was devoted to lectures and the other half to practical exercises using real data from outdoor experiments and available tools.

The four days program contained more than 12 lectures. Five enthusiastic lecturers have presented several aspects of dynamic mathematical techniques for the analysis of data that represents the thermal behaviour of buildings. Introduced have been discrete time as well as continuous time models and methods. The software tool LORD (for Windows) was distributed and the recent version of CTSMR-TMB was presented in a crash course, also. A step-by-step exercise was followed using the latest version of R and the R-toolbox and R-Studio (March 2023). Several high-quality data series, that have been developed in the past by the DYNASTEE network, were made available to the participants, including detailed documentation about the experimental setup, like sensors and instrumentation and creation of several test periods with different indoor temperature regimes. These data were applied to both LORD and CTSMR. See also: www.dynastee.info in the data-analysis/overview section: a recent extensive [paper](#) presenting the data analysis process applied to high quality data from an outdoor experiment can be downloaded for free. Discussed were the uncertainty issues converting from building physical models to mathematical models for the analysis process.

Application examples of the distributed data have been discussed as well as smart

metering data for the energy performance assessment of buildings. A visit to the impressive and recently inaugurated Energy House 2.0 showed two real size houses that were under test in the laboratory. Innovative constructions and materials are applied and tested under a variety of climatic conditions. The smart metering laboratory in the nearby Joule house was visited also. Several types of smart meters are tested in particular for communication with different parties.

At the end of the Spring School week, the first European Building Performance Symposium took place on the 28th April 2023. This day was jointly organised by the University of Salford and the DYNASTEE network.

Last couple of years were a-typical; the decision was made to postpone the Summer Schools (2020 to 2022) for good reasons and replace it by webinars. However, DYNASTEE has already started organising the next Summer School to take place in Almería in Spain in September 2024. This will be a 6-days full Summer School with classroom-based learning sessions and interactive sessions. Feel free to contact mjose.jimenez@psa.es



At the Joule House, smart metering



In the Energy House 2.0 laboratory



Some of the participants and lecturers at the Spring School 2023

Outcomes of the European Building Performance Symposium

The DYNASTEE Symposium was held in April 28, and hosted around 40 people from across Europe to discuss how we test the real-world performance of buildings, although not a huge gathering, this was our first DYNASTEE event since the end of the Covid pandemic. It was a great chance to hear about the latest technology and methods of measuring building performance and a great time for old friends to meet and new contacts to be made. We covered the following:

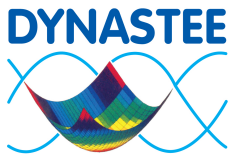
- Updates on latest EU and UK legislation around BPE
- Update on the available guidance and standards around BPE
- Novel measurement of whole house heat loss
- Digital twinning using measured data
- Measurement of occupancy
- Update of work in the [Energy House 2.0 facility](#)

We hope to build on this area in the coming years, to bring people together to build networks and to discuss some genuinely novel methods that are cost effective and beneficial for clients/stakeholders in the construction sector.

DYNASTEE will certainly be doing this again next year, maybe somewhere more exotic than Salford!



At the European Building Performance Symposium



DYNASTEE Datasets made available for training purposes

In the past decades, the DYNASTEE network has gathered a number of well-documented high-quality datasets. Several have been used regularly in the training events (workshops, Summer Schools). Producing high-quality data is a very expensive process and many man-hours are spent to carry out the experimental work and to create these data series. In most cases they have been used for training people the specific issues of dynamic analysis in building energy performance research projects, but also to develop dedicated standards (CEN and ISO).

Participants to the DYNASTEE workshops and training events in the past have been using several of the available datasets and sometimes presented results in scientific articles in journals. The DYNASTEE network has started in April 2023, in order to keep track of where the datasets are used, a registration procedure. The datasets are free to be used for educational purposes and may not be sold in any format. When used for scientific articles a proper reference is requested that should include the DYNASTEE network (www.dynastee.info), the reference to the applied dataset and the date of download. Request for data can be addressed to contact mjose.jimenez@psa.es

At present, three zipped data-series are available:

- The first data-series are simulated data and are grouped in *BenchmarkTestDynMethods20.zip*. This zipped folder includes the following files: *Dataseries* in text format and *Besim20.pdf* (document describing two cases for self-training) and *defstatest.pdf* (document that contains definitions and statistical tests).
- The second data-series are real experimental data from a Round Robin test box. Minutely data of 45 sensors are made available for about a month divided into three separate periods, each with its particular heating regime. These data make it possible to perform different analysis of walls, window and space. The data-series are placed in the zipped folder *PSA_RRbox_DataSeries20.zip* and contains three data-series (*Almeria_series16, 17 and 18*) including the documentation *SS20_RRbox_Instruction_document.pdf* (describing the experimental setup). A recent extensive [paper](#) presents the data analysis process applied to these high quality data-series.

- The third data-series are real experimental data from a well-controlled in-situ experiment of a homogenous concrete wall. Two periods of consecutive data are available; the first one with shading of the external wall and hence the mounted sensors. In the second period the shading device has been removed. These data-series are placed in the zipped folder *In_Situ_Wall.zip* and contains two data-series (*GFwallShaded.csv* and *GFwallNotshaded.csv*), the description of the experimental setup, *In_Situ_GFwall20s.pdf* and a proposal for an exercise *In_Situ_ExerciseWall_20s.pdf*.

In addition, two extensive documents dealing with data analysis, have been made available from the IEA-EBC Annex 58 project (2011 – 2016):

- The document [Guidelines_Analysis_BuildingPhysics_A58.pdf](#) focuses on criteria that must be considered to avoid mistakes in pre-processing data and constructing candidate models.
- The document [Guidelines_Analysis_StatisticalModelling_A58.pdf](#) presents criteria for selecting the optimal method and model to analyse the available data.

DYNASTEE is testing other datasets from the list below. When they are tested and accepted, information will be placed on our website.

1. Simulated data homogenous wall - available
2. In-Situ data from homogenous wall - available
3. In-Situ data from composition wall - soon available
4. Data from Round Robin box (research) - available
5. In-Situ data from an air gap envelope - soon available
6. Data from a whole building - under review
7. Data from a co-heating site experiment - under review
8. Smart metering data - work in progress

Call for National Advocates

Would you like to be a National Advocate for DYNASTEE in your country? The role involves promoting DYNASTEE and publicising our events to your network. For more information, or to become a National Advocate, please contact aimee.byrne@tudublin.ie

ABOUT DYNASTEE

DYNASTEE stands for: "DYNAMIC Analysis, Simulation and Testing applied to the Energy and Environmental performance of buildings". DYNASTEE is a platform for exchange of knowledge and information on the application of tools and methodologies for the assessment of the energy performance of buildings. DYNASTEE functions under the auspices of the INIVE EEIG and it is open to all researchers, industrial developers and designers, involved in these subjects.

The EU energy research projects PASSYS (1985-1992), COMPASS and PASLINK created the initial European network of outdoor test facilities, developed test methods, analysis methodologies and simulation techniques. It resulted eventually into the PASLINK EEIG network (1994). The network profiled itself as a scientific community of experts on Testing, Analysis and Modelling. In 1998, PASLINK EEIG started a new project: PVHYBRID-PAS, on the overall performance assessment of photovoltaic technologies integrated in the building envelope. The use of the outdoor test facilities in several member states situated in different climates, together with the available expertise on analysis and simulation techniques, offered the ingredients for more successful projects: IQ-TEST (2001), focusing on quality assurance in testing and analysis under outdoor test conditions, as well as evaluation techniques of collected in-situ data. The expertise of the network was also offered to other European projects, such as DAME-BC, ROOFSOL, PRESCRIPT, IMPACT and PV-ROOF.

In 2005, the EEIG was converted into an informal network that today is known as DYNASTEE. It is offering a network of excellence and should be considered as an open platform for sharing knowledge with industry, decision makers and researchers. It has been very active in supporting projects such as the IEA-EBC Annex 58 and more recently the IEA-EBC Annex 71 'Building energy performance assessment based on in-situ measurements'.

