

TEXTILE ROOFS 2013

The 18th edition of the International Workshop on the Design and Practical Realization of Architectural Membrane Structures was organized by the Department of Geodesy and Geoinformation Science of the Institute of Technology in Berlin, from the 17th till the 19th of June. On the one hand a large number of very interesting projects and innovative topics were discussed during the morning sessions. In the afternoons on the other hand, hands-on workshops were organized, where both physical and computational modelling tools were explored and investigated.

Lectures

B. Stary and F. Neitzel welcomed the participants of Textile Roofs 2013 and introduced the four lecturers of the first morning session.

'On Shapes, Forms and Structures' was presented by J. Hennicke. The disquisition showed the great importance of different types of physical models and experimental techniques for the understanding and optimization of lightweight structures. D. Ströbel and J. Holl introduced the software Easy as a modelling tool for cable nets, membrane structures and inflatable cushions. The form-finding and the statical analysis are performed in order to optimize the construction and to generate the suited cutting pattern. The developed add-on software allows creating a holistic model. Another numerical modelling tool Formfinder is presented by R. Wehdorn-Roithmayr. Besides the form-finding and analysis tools, different detailing solutions are proposed and a database with many forms and typologies is provided. Finally, several 'Digital Tools in Architectural Education' are shown in the presentation of M. Feyerabend. The main principles are mentioned: a combination of physical and numerical modelling is needed. Furthermore, two projects are discussed more in detail: a swimming pool cover and the „Echolot“-pavilion student's project (Fig. 1).



Figure 1. Physical Model Hochschule Koblenz (Martin Korzenski, Peter Harsch, Sebastian Gäbler)

The second day started with 'From Tent to Textile Architecture' by J. Groth. Although the design of tents uses the same approaches, some crucial aspects, like structure, materials and connections, need to be further investigated. M. Kiefer gave an overview of some interesting projects all over the world. A variety of structural systems was shown, with small to large scale projects. The fascinating lecture of N. Fiedler impressed everybody. His passionate talk on a number of Brazilian projects contained a lot of different aspects and structural designs. Not only architectural structures, but also, for example, an undersea oil extraction system with membranes was shown (Fig. 2).



Figure 2 a-b. Two projects of Fiedler Tensile Structures: Morro da Urca and MTV-VMB

As it is known that acoustic and thermal insulation of single layer membranes is not always optimal, a lot of research is done on this aspect. F. Sahnoune clarified a 'New Development in Façade and Acoustics', where an interesting solution and some remarkable results are provided. Lastly, K. Moritz guided us through some real scale material testing methods, and more specific the 'Structural design and membrane analyses of ETFE-film-cushions'. The presentation showed several selected exemplary projects (Fig. 3).

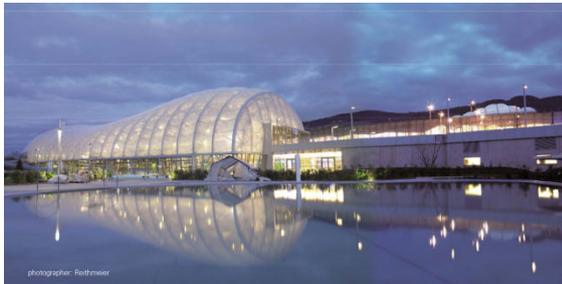


Figure 3. Swimming Pool Neydens - © seele cover GmbH, Photographer: Matthias Reithmeier, Diamond Graphics, Augsburg

The third day began with an exposé by R. Wagner. Firstly, a theoretical overview of some interesting remarks on the determination of the material properties of membranes was discussed. Secondly, a research project of an 'Energy efficient textile building with a solar thermal model and seasonal heat storage' is thoroughly illustrated. In the interesting second lecture, J. Llorens discussed the problematic of acoustics in buildings and membrane structures, with the focus on concert halls and large sport facilities. Through a set of examples, the main attention aspects were stated and some possible solutions were illustrated.

The conceptual and structural design of membrane structures is one aspect. But what if the manufacturing and assembling techniques wouldn't be able to follow the growing demand for textile architecture? M. Wallin showed us their new welding features in his presentation 'Innovations in HF Welding'. Also a new technique for bending air inflated beams, called Tubeflexx, is presented. To close the last morning session, M. Mollaert introduced the (still ongoing) research that has been done on the integration of technical textiles in Kinematic Form Active structures. Experimental investigation of a case study is done in order to verify and optimize existing numerical models for membrane structures.

Workshops

During the afternoon sessions, three parallel workshops took place, allowing the participants to choose and shift as desired. The first session involved a physical modelling workshop, where the interesting brief introduction led to a creative set of small scale maquettes (Fig. 4). The other two were hands-on workshops, introducing numerical modeling tools by means of representative examples and exercises; on the one hand the Formfinder software was presented and on the other hand the Easy modeling tool.

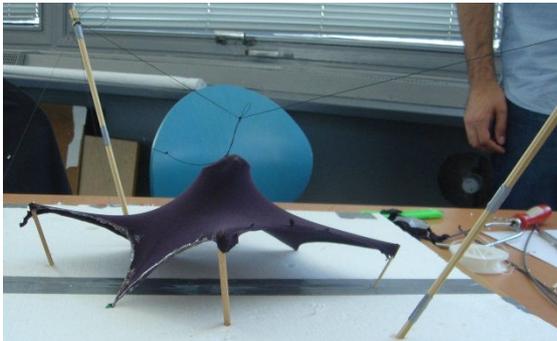


Figure 4. One of the small scale maquettes made during the physical modelling workshop

Other activities

For those who arrived earlier in Berlin, an Ice Breaker Party was planned on the 16th of June. The richly filled table with snacks and drinks accompanied the interesting talks with the participants and organizers. Also during lunch break, there was a very pleasant and interesting atmosphere, whereafter a collective walk towards the workshops closed the morning session. On Monday evening, a Special Guest Lecture of GMP Architects was organized. A series of amazing projects was presented by M. Glass and L. Brögger. The detailed images of the different construction stages of the projects gave a very good impression of the whole! On Tuesday evening, an excursion to the construction site of the Berlin-Brandenburg Airport BER (Fig. 5) was planned, which was already introduced in the Monday evening lecture. After, a visit of the Gasometer (Fig. 6) in Berlin-Schöneberg was scheduled. The impressionant membrane dome could be visited from the insight, whereafter we could join the BBQ situated next to the gasometer.



Figure 5. Airport Berlin-Brandenburg



Figure 6. Gasometer at Berlin-Schöneberg

As a closing event, the results of the Students Project were presented. During the preceding week, they designed a goodlooking and clever roof system for the ruin of the Lindow Abbey in Brandenburg (See also [Report on the Students Workshop TR2013](#)). After this interesting presentation and in general fascinating Textile Roofs 2013, a Parting Drink was offered. It can definitely be said that the 18th edition was a succes! Thanks to the organizators and participants!

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