Abstract of keynote lecture by Dominique Bernard:

Building a pore network model from a grey level 3D image of a porous sample to predict its permeability tensor

Pore network models (PNM) are widely used for more than 50 years to study pore scale transports. It is commonly admitted that, in order to give realistic property predictions, the PNM must summarize all the relevant topological and geometrical aspects of the considered porous medium. Even if 3D images are relatively easy to obtain, the construction of a representative PNM only using information directly extracted from the 3D images is still difficult. In this work we present a methodology for such a construction. Starting from a 3D image of a porous sample, all the crucial steps of the method are presented. Permeability values obtained by our PMN are compared to values obtained by direct numerical modeling where Stokes equations are solved using the voxelized 3D image as computation grid. See images on cover of the flyer. An extension of the model that allows to compute the full permeability tensor is also presented.

Information on some of the presented software:

AvizoFire

Visualization Sciences Group (VSG) is a 3D visualization software for scientific and industrial data. http://www.vsq3d.com/avizo/overview

Morpho+

Morpho+ is a flexible 3D analysis software package, which has been developed at the Centre for X-ray Tomography of the Ghent University (UGCT).

www.uqct.ugent.be

VG Studio

VGStudio MAX allows for large CT data sets to be processed quickly and offers 3D visualization of the scanned objects.

Material- and geometry-related analyses can be performed with reliable algorithms.

www.volumegraphics.com

GENERAL INFORMATION

Location Empa, Dübendorf

Überlandstrasse 129

AKADEMIE

Costs The event is sponsored by Empa and

free of charge for the participants.

Registration www.empa.ch/imaging

Deadline October 24, 2012

Contact Empa

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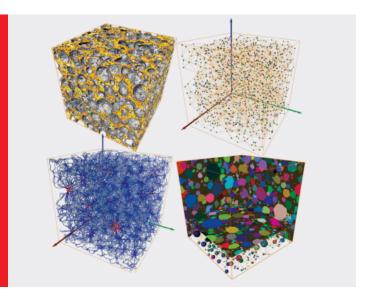
www.empa.ch





TOPICAL DAY

Imaging and image analysis II



Empa, Dübendorf, Überlandstrasse 129 Tuesday, October 30, 2012, 08.30 – 17.00

Online registration: www.empa.ch/imaging

TOPIC

Images from scanning electron microscopy to X-ray and neutron radiography and tomography as well as different methods and techniques to analyze images.

TARGET AUDIENCE

Scientist, PhD and postdocs working with different imaging techniques and analysis procedures

OBJECTIVES

At Empa, many scientists are involved in imaging and need software for data visualization and analysis. A first Topical Day was held in May 2012. Since attendees expressed their need to know more about the different software and methods for visualization, segmentation, analysis and registration, a second Topical Day on imaging is presented.

In the first part of the day's program, Dominique Bernard will present an overview of analysis methods applied on porous materials. Then, several Empa scientists will present examples of their imaging work. In the second part, scientists from different imaging software companies will cover the scientific capacities of the respective software. All presenters will attend the full day in order to be able to participate in the round table discussion on Empa's needs in terms of imaging analysis capacities.

The aim of the topical day series is to provide a platform for exchange and network on these imaging different approaches. A new internal "Imaging" wiki page is now available.

PROGRAM

08.30	Welcome Coffee & Registration
09.00	Opening remarks Dominique Derome, Empa
09.10	Building a pore network model from a grey level 3D image of a porous sample to predict its permeability tensor Dominique Bernard, CNRS, Université de Bordeaux, ICMCB, Pessac, France
10.20	Coffee break
10.40	Examples and current work from colleagues at Empa Marta Rossell, Microscopy center. Electron tomography at Empa Hannelore Derluyn, Building Science and Technology Segmentation between salt solution and crystals in porous media Michele Griffa, Concrete and Construction Chemistry Characterization of cracks in cement-based materials by microscopy and image analysis Rolf Stämpfli, Protection and Physiology. Transplanar and lateral water transport in textiles Potis Dimopoulos Eggenschwiler, Internal Combustion Engines. Image processing for TEM, shadowgraphy and PIV Leyre Sagarna, Solid State Chemistry and Catalysis. Porous Materials for Energy Related Applications
12.15	Lunch Presentation of commercial software and open-source codes
13.30	Peter Westenberger, on AvizoFire
14.00	Loes Brabant, on Morpho+
14.30	Alessandra Patera, Empa, on Slicer 3D
14.40	Coffee break
15.00	Daniela Handl, on VG Studio
15.30	Michele Griffa, Empa, on Elastix
15.45	Round table – What are our needs at Empa?
17.00	Closing

REGISTRATION

Imaging and image analysis II

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Deadline: October 24, 2012

Please register online:

www.empa.ch/imaging

You will receive a confirmation by e-mail.