



New SIG on Fibre Suspension Flows

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Outline



- ERCOFTAC and Special Interest Groups
- SIG on Fibre Suspension Flows
 - Fibre suspension flows in papermaking and in other applications
 - Why the SIG?
 - Organizing committee (Preliminary)
 - Action plan
- Discussion

ERCOFTAC



- Promotes joint efforts of European research institutes and industries as well as governments and professional societies
- Exchange of technical and scientific information
- Development and validation of codes and databases
- Stimulate the creation of advanced training activities
- Influence on funding agencies, governments, the European Commission and the European Parliament
- Contacts with non-European groups
- Stimulates, **through the creation of SIGs**, well-coordinated European-wide research efforts **on specific topics in FTAC**

Special Interest Group



- Structure
 - Well defined specific topics on FTAC
 - Composed of **ERCOFTAC members**
 - Associated with **at least two Pilot Centres**
 - Has an international **organizing committee**
- Typical activities
 - Organizing workshops, courses, summer schools,...
 - Comparison of CFD codes
 - Exchange of research results
 - Creation of experimental and/or numerical data bases
- Currently about 20 SIGs (see: www.ercoftac.org)
 - LES, Turbulence modelling, Compressible flows, PIV, Environmental flows, Multi-phase flows, Reactive flows, etc...



New SIG on

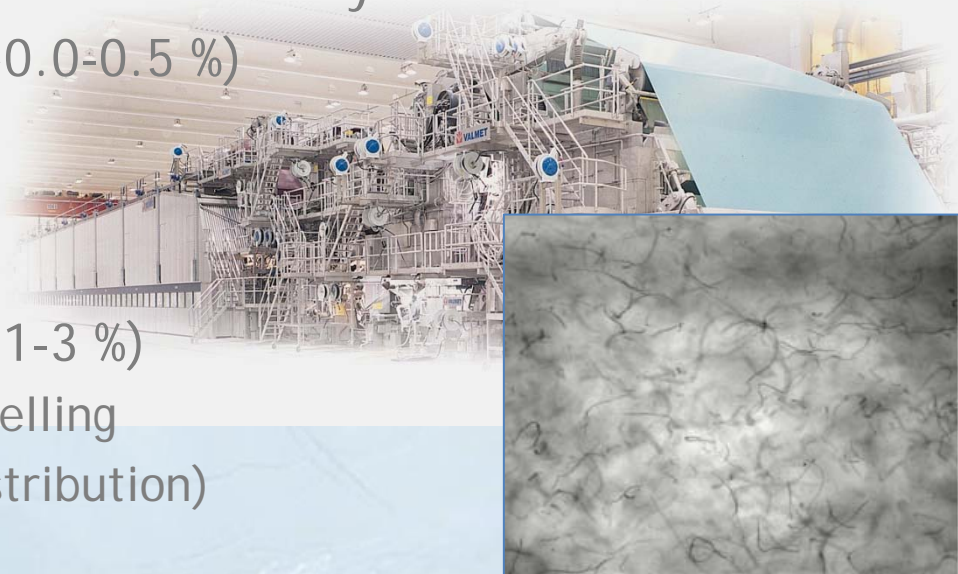
FIBRE SUSPENSION FLOWS

NPC 12, May 29-30, 2008, Stockholm

Fibre Suspension Flows in Papermaking



- The fluid is a mixture of water and cellulose (wood) fibres
- Gases (dissolved or bubbly) and chemicals may be involved
- Dilute fibre suspension flows (~0.0-0.5 %)
 - Turbulence modelling
 - Fibre orientation distribution
 - PIV or other laser techniques
- Dense fibre suspension flows (~1-3 %)
 - Eulerian multi-phase flow modelling
 - Fibre flocculation (floc size distribution)
 - Fibre-turbulence interactions
 - Ultrasound or tomographic methods
- High consistency flows (MC=medium consistency) (~3-15 %)
 - Rheology in pumping and head losses in long tubes
 - You can walk on it at 15 % consistency



Fibre Suspension Flows in other Applications



- Dry forming of absorbent products such as diapers and napkins
 - Transport of wood fibres in air flows
 - ref: Ph.D. thesis by Camilla Ljus at Chalmers
- Production of MDF board
 - Flow of fibres, glue, moisture and air
 - Ref: Ph.D. thesis by Olof Melander, Metso Paper Sundsvall
- Polymer flows in melt-blowing extruders
- Textile fibres
- Etc...

Why the ERCOFTAC SIG on Fibre Suspension Flows?



- Motivation
 - Papermaking forums (conferences, etc.) are usually too commercial and marketing oriented for researchers
 - Fibre suspension flows are too marginal research area in multi-phase flow forums (e.g., International Conference on Multiphase Flows)
 - Need for a new forum
- Kick-off discussions by
 - Royal Institute of Technology (KTH): Fredrik Lundell
 - STFI: Daniel Söderberg
 - Kuopio University: Jari Hämäläinen
 - Tampere University of Technology: Pentti Saarenrinne, Hannu Eloranta
 - Nordic Pilot Centre of ERCOFTAC: Stefan Wallin, FOI
 - Metso Paper, Inc: Marko Hyensjö, Tomas Wikström, Sweden; Hannu Turpeinen, Finland

Organizing Committee (Preliminary)



- The following persons were interested:
 - Darek Asendrych, Czestochowa University of Technology, Poland
 - Bendiks Jan Boersma, Delft University of Technology, The Netherlands
 - Thanasis D. Papathanasiou, University of Thessaly, Greece
 - Salaheddine Skali-Lami, University of Nancy, France (member?)
 - Roland Zelm, Technische Universität Dresden, Germany
 - Graça Rasteiro, Chem. Eng. Dep., FCTUC, Spain (member?) NEW!
- in addition to persons from the Nordic Pilot Centre:
 - Jari Hämäläinen, University of Kuopio, Finland
 - Hannu Eloranta, Tampere University of Technology, Finland
 - Fredrik Lundell, Royal Institute of Technology (KTH), Sweden
 - Janne Poranen, VTT Technical Research Centre of Finland, Finland
 - *Industry*: Tomas Wikström, Metso Paper, Inc., Sweden

Action plan



- Organize an annual meeting, including both CFD and experiments
- Organize special sessions or mini-symposia:
 - Special session in the Nordic PC meeting 29-30 May 2008
 - Papermaking Research Symposium - PRS2009, June, 2009, Kuopio
- Promoting ERCOFTAC membership
- Transfer of knowledge and experience to industry
- First map out and then bring together research from different application areas and establish fundamental framework for experimental and numerical studies of fibre suspension flows
- Develop Best practical guidelines for fibre suspension flows (an extension of the Best practical guidelines for multi-phase flows)

Three Levels of Networking



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NPC 12, May 29-30, 2008, Stockholm

Acknowledgements



- Finnish-Swedish Table at the Conference Dinner of ICMF in 2007
 - *Fredrik introducing the idea for Finnish persons from TUT and UKU*
- Stefan for all the practical work in "lobbying" the ERCOFTAC board since the autumn 2007
- All the other persons who have been and are willing to share their knowledge and to give effort to the organizing committee



The background of the entire image is a light blue, textured surface resembling paper or a fine mesh. Overlaid on this are several white, curved lines that sweep across the frame from the top left towards the bottom right, creating a sense of motion and depth. In the lower-left quadrant, there are faint white line drawings of industrial machinery, including what appears to be a large roller or mill component.

**01-04
JUNE
2009**

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